Simulink® Check™

Support Package for CI/CD Automation for Simulink® Check™ Reference

MATLAB®&SIMULINK®

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July 2024	PDF Only	Versions 22.2.17, 23.1.17, 23.2.7, and 24.1.4

10 Tokens

11 Built-In Task Library

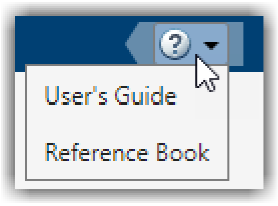
12 Built-In Query Library

Reference Book

This PDF is a Reference Book with information on the API, artifact types, built-in tasks, and built-in queries.

For examples and general information, see the User's Guide PDF. You can access the PDFs from either:

- https://www.mathworks.com/matlabcentral/fileexchange/115220-ci-cd-automation-for-simulink-check
- The question mark icon in the Process Advisor app



Process Advisor UI and API

Process Advisor

Automate your development workflow and prequalify changes before submitting to source control

Description

This app requires CI/CD Automation for Simulink Check.
Use the Process Advisor app to create, deploy, and automate a consistent prequalification process for Model-Based Design (MBD). The app includes built-in tasks for performing common MBD tasks like checking modeling standards with the Model Advisor app, running tests with Simulink Test™, generating code with Embedded Coder®, and inspecting code with Simulink Code Inspector™. You can use the customizable process modeling system to define the steps in your process and use the app to run each of the steps. As you edit and save the artifacts in your project, the app tracks changes and automatically identifies tasks and task iterations that have outdated results. The Process Advisor app runs your tasks locally for prequalification. The tasks run on the machine that is running MATLAB® and does not use an external CI system.

If your process model defines multiple processes, you can select which process you want to use from the **Processes** gallery in the toolstrip. By default, process models have a default process called **CI Pipeline**.

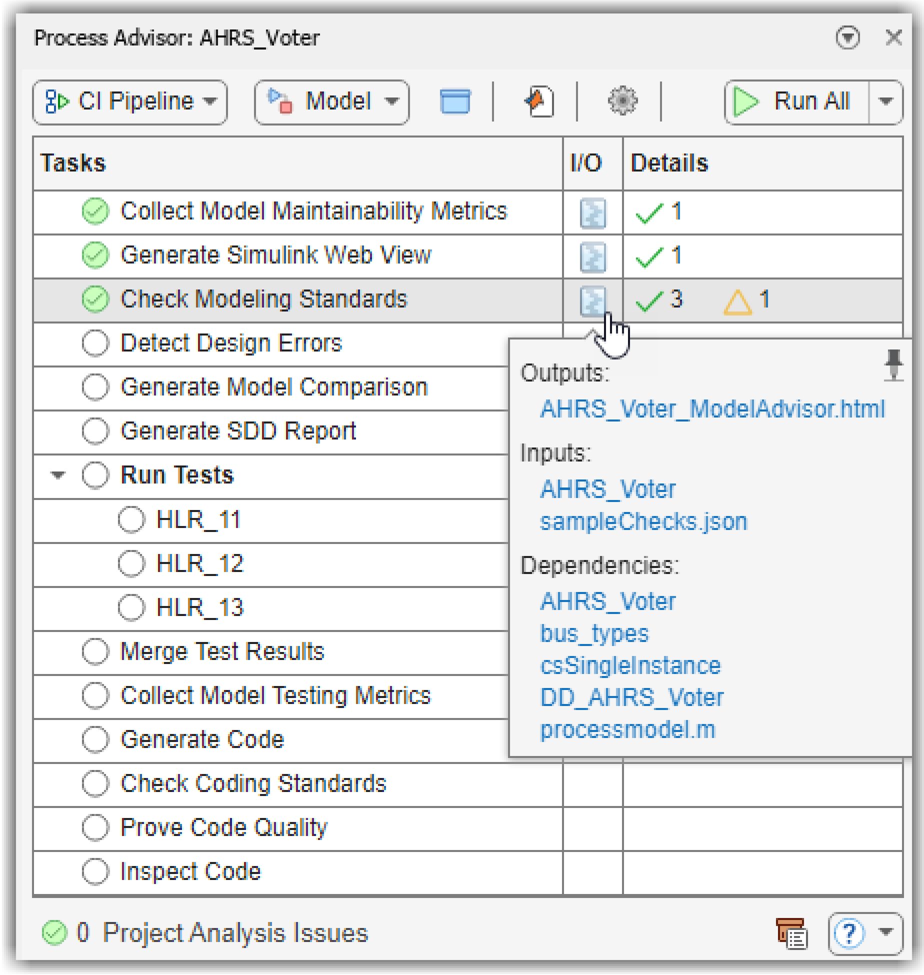
To run the tasks:

- Point to a task in the **Tasks** column and click the run button ▷ to run that task and outdated dependent tasks.
- Click **Run All** to run each of the tasks shown in the **Tasks** column.
- Click **Run All** > **Force Run All** to force the build system to run each task, even if the tasks already have up-to-date results.
- Click **Run All** > **Clean All** to clear the task results and delete task outputs for each of the tasks.
- Click **Run All** > **Refresh All** to manually refresh the list of tasks that appears in the **Tasks** column.

When the Process Advisor app runs tasks, a **Stop** button appears in the top-right corner. You can click the **Stop** button to stop the queued tasks from running next.

To edit the process model, click the **Edit process model** icon. If you have a P-coded process model file, you must delete the `processmodel.p` file before you can edit the process model using Process Advisor.

After Process Advisor analyzes the project, the **Project Analysis Issues** pane shows the errors or warnings that the artifact analysis generated. For more information, see “Troubleshoot Missing Tasks, Artifacts, and Dependencies”.



Tasks	I/O	Details
Collect Model Maintainability Metrics		✓ 1
Generate Simulink Web View		✓ 1
Check Modeling Standards		✓ 3 △ 1
Detect Design Errors		
Generate Model Comparison		
Generate SDD Report		
Run Tests		
HLR_11		
HLR_12		
HLR_13		
Merge Test Results		
Collect Model Testing Metrics		
Generate Code		
Check Coding Standards		
Prove Code Quality		
Inspect Code		

Outputs:
AHRS_Voter_ModelAdvisor.html

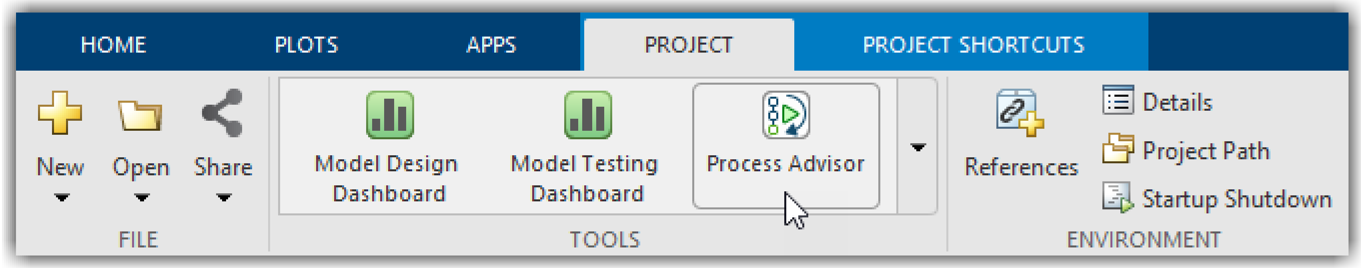
Inputs:
AHRS_Voter
sampleChecks.json

Dependencies:
AHRS_Voter
bus_types
csSingleInstance
DD_AHRS_Voter
processmodel.m

Open the Process Advisor App

- For a Simulink model:
  - On the **Apps** tab, click **Process Advisor**.
  - Or, in the Command Window, enter:

    ```
    processadvisor(modelName)
    ```
- For a project:
  - On the **Project** tab, in the **Tools** section, click **Process Advisor**.



- Or, in the Command Window, enter:

  ```
  processAdvisorWindow
  ```

Examples

Open Process Advisor For Model

Open the Process Advisor app for a Simulink model in a project.

Create and open a working copy of the Process Advisor example project. MATLAB copies the files to an example folder so that you can edit them.

```
processAdvisorExampleStart
```

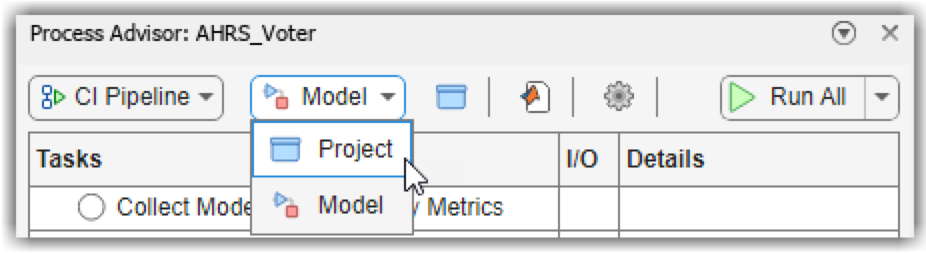
The project contains the model `AHRS_Voter.slx`.

Open the Process Advisor app for the model `AHRS_Voter.slx`.

```
processadvisor("AHRS_Voter")
```

By default, the Process Advisor pane shows the tasks for the current model.

To view the tasks associated with the project, in the Process Advisor pane, you can switch the filter from **Model** to **Project**.



Open Process Advisor For Project

Open the Process Advisor for a project and view the pipeline of tasks.

Create and open a working copy of an example project. MATLAB copies the files to an example folder so that you can edit them.

```
proj = Simulink.createFromTemplate("code_generation_example.sltx",...
Name="New Project");
```

Open the Process Advisor for the project.

```
processAdvisorWindow
```

The **Tasks** column shows the pipeline of tasks generated from the process model.

Click **Edit** to open the process model file that defines the process.

Programmatic Use

Note that you need to load a project before you open the Process Advisor.

`processadvisor(modelName)` opens the Simulink model, `modelName`, in the current project and opens a Process Advisor pane to the left of the Simulink canvas.

`processAdvisorWindow()` opens the Process Advisor app for the current project. The app opens in a standalone window.

processadvisor

Open Process Advisor app for Simulink model

Syntax

```
processadvisor(modelName)
processadvisor( ___ ,processName)
```

Description

`processadvisor(modelName)` opens the Simulink model, `modelName`, in the current project and opens a Process Advisor pane to the left of the Simulink canvas. You need to load a project to use the function `processadvisor`.

This function requires CI/CD Automation for Simulink Check.

`processadvisor( ___ ,processName)` opens Process Advisor for the process specified by `processName`. By default, the function opens Process Advisor for the default process in the process model.

Examples

Open Process Advisor for Model in Project

Open the Process Advisor app for a specific model in a project.

Open the Process Advisor example project, which contains an example model `AHRS_Voter.slx`.

```
processAdvisorExampleStart
```

Open the Process Advisor app for the model `AHRS_Voter.slx`.

```
processadvisor("AHRS_Voter")
```

The `AHRS_Voter` model opens in Simulink and the Process Advisor app opens in a pane to the left of the Simulink canvas. You can use the Process Advisor app to run the tasks in your process.

Input Arguments

`modelName` — Model name
character vector | string

Model name, specified as a character vector or string.

Do not include the model extension (`.slx` or `.mdl`) in the model name.

Example: `"AHRS_Voter"`

Data Types: `char` | `string`

`processName` — Process name
string

Process name, specified as a string.

Example: `"CIPipeline"`

Data Types: `string`

Alternative Functionality

App

You can also open the Process Advisor app for a model by using the Apps Gallery.

1. Open a Simulink model in your project.
2. Click the **Apps** tab.
3. In the **Model Verification, Validation, and Test** section, click **Process Advisor**.

processAdvisorWindow

Open standalone Process Advisor window for project

Syntax

`processAdvisorWindow()`

Description

`processAdvisorWindow()` opens the Process Advisor app for the current project. The app opens in a standalone window.

This function requires CI/CD Automation for Simulink Check.

Examples

Open Standalone Process Advisor Window

Open the Process Advisor app for a project.

Open the **Process Advisor** example project, which contains an example process model.

```
processAdvisorExampleStart
```

Open the Process Advisor app for the project.

```
processAdvisorWindow()
```

The standalone **Process Advisor** window shows each of the task iterations in the project, organized by task. In the **Task** column, the table shows each task and the artifacts that the task iterates over. You can double-click on an artifact name to open the artifact. For example, if you double-click on the name of a test case, the test case opens in Test Manager.

Alternative Functionality

App

You can also open the Process Advisor app for a project directly from the **Project** tab in MATLAB.

On the **Project** tab, in the **Tools** gallery, click **Process Advisor**.

Process Modeling System API

The support package provides a customizable process modeling system that you can use to define your build and verification process. You define your pipeline of tasks in the process model. The process model is a file (`processmodel.p` or `processmodel.m`) that specifies the tasks in the process, the queries that determine which artifacts to use for each task, the artifacts associated with each task, and the dependencies between tasks. Open the Process Advisor app or use the function `createprocess` to create a process model for your project. Inside the process model file, you can add, remove, and reconfigure tasks and the dependencies between tasks.

Classes

Class	Description
`padv.Artifact`	Store artifact information
`padv.Process`	Group tasks and subprocesses in process model
`padv.ProcessModel`	Define tasks and process for project
`padv.Query`	Select set of artifacts from project
`padv.Subprocess`	Group tasks and subprocesses in process
`padv.Task`	Define single step in process
`padv.TaskResult`	Create and access results from task

Functions

Create and Access Process Model

Function	Description
`createprocess`	Create a process model
`getprocess`	Get process model object for process model in project

createprocess

Create process model

Syntax

```
processModelPath = createprocess()
processModelPath = createprocess(Name=Value)
```

Description

`processModelPath = createprocess()` creates a process model at the project root and returns the path to the created process model. The process model is saved as `processmodel.m`.

By default, the process model is a default process model that can create a model-based design pipeline. You can only call `createprocess` if you have a project open.

`processModelPath = createprocess(Name=Value)` specifies the output process model using one or more `Name=Value` arguments.

Examples

Create Process Model

Open a project that does not have a process model and use `createprocess` to create a copy of the default process into the project.

Open an example project, for example `matlab.project.example.timesTable`, that does not have a process model.

Create a process model for the project.

```
processModelPath = createprocess
```

`createprocess` copies the default process model into the project root and saves the path to the process model to `processModelPath`.

Create a project object for the currently loaded project.

```
myProject = currentProject;
```

Add the process model file to the current project.

```
addFile(myProject,processModelPath)
```

Open the Process Advisor app in a standalone window to view the tasks associated with the project and project artifacts.

```
processAdvisorWindow
```

Overwrite Process Model with Empty Process

Open a project and overwrite the process model with an empty process model.

Open the **Process Advisor** example project, which contains an example process model.

```
processAdvisorExampleStart
```

Use `createprocess` to overwrite the existing process model with an empty process model.

```
processModelPath = createprocess(Template="empty",Overwrite=true)
```

Open the created process model to view the commented-out example code.

```
open(processModelPath)
```

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `processModelPath = createprocess(Overwrite=true)`

`Template` — Name of predefined process model template
`"default"` (default) | `"empty"` | `"parallel"`

Name of predefined process model template, specified as either:

- `"default"` — Process model file that includes several built-in tasks
- `"empty"` — Process model file that contains commented-out example code for adding built-in and custom tasks
- `"parallel"` — Process model file designed for parallel CI jobs.

Example: `"empty"`

Data Types: `char` | `string`

`Overwrite` — Setting to overwrite existing process model
`false` or `0` (default) | `true` or `1`

Setting to overwrite existing process model, specified as a numeric or logical `0` (`false`) or `1` (`true`).

Example: `true`

Data Types: `logical`

`Subprocess` — Set up default process model to use subprocesses to group tasks
`false` or `0` (default) | `true` or `1`

Set up default process model to group model verification and code verification tasks using subprocesses, specified as a numeric or logical `0` (`false`) or `1` (`true`).

If you specify `Subprocess` as `true`, the default process model template contains a subprocess for model verification tasks, `"Model Verification"`, and a subprocess for code verification tasks, `"Code Verification"`.

Example: `true`

Data Types: `logical`

Output Arguments

`processModelPath` — Path to created process model
character vector

Path to created process model, returned as a character vector.

By default, `createprocess` creates a process model at the project root.

Alternative Functionality

App

If a project does not have a process model, you can use the Process Advisor app to create the default process model. To open the Process Advisor app for a project, in the MATLAB Command Window, enter:

```
processAdvisorWindow
```

When you open the Process Advisor app on a project that does not have a process model, the app automatically creates a copy of the default process model at the root of the project.

getprocess

Get process model object for process model in project

Syntax

```
processModelObject = getprocess()
```

Description

`processModelObject = getprocess()` returns a process model object, `processModelObject`, for the process model in the project. You can use the process model object to view the properties of the process model in the project. For more information, see `padv.ProcessModel`.

If the current project does not have a process model, the function `getprocess` automatically creates a new process model at the root of the project.

Examples

Find the Default Query for the Current Process

Use `getprocess` to find the default query that the current process model uses. If you have a task that does not specify an iteration query, the default query defines which artifacts the process iterates over. By default, custom tasks run once per project because the default query is `"padv.builtin.query.FindProjectFile"`.

Open the **Process Advisor** example project, which contains an example process model.

```
processAdvisorExampleStart
```

Get the properties of the current process model.

```
currentProcessModel = getprocess()
```

Get the default query for the current process model.

```
defaultQuery = currentProcessModel.DefaultQueryName
```

```
defaultQuery = 

    "padv.builtin.query.FindProjectFile"
```

You can use the `findTask` and `findQuery` functions on the loaded process model to find specific tasks and queries in the process.

```
findTask(currentProcessModel,"padv.builtin.task.RunModelStandards")
```

Output Arguments

`processModelObject` — Properties of process model
`padv.ProcessModel` object

Properties of process model, returned as a `padv.ProcessModel` object.

The `padv.ProcessModel` object returns the names of the tasks, queries, default query, and root process model file for the process.

padv.Artifact

Store artifact information

Description

A `padv.Artifact` object represents an artifact that you can run a task on in the process defined in your process model. For example, you can use a `padv.Artifact` object as the input to functions like `runprocess` and `generateProcessTasks` when you only want to run or generate tasks associated with a specific artifact.

Creation

Syntax

```
artifactObject = padv.Artifact(artifactType,artifactAddress)
artifactObject = padv.Artifact(___,Name=Value)
```

Description

`artifactObject = padv.Artifact(artifactType,artifactAddress)` stores artifact information in a `padv.Artifact` object, `artifactObject`. You can use the artifact information when you want to get the ID for a specific task iteration.

`artifactObject = padv.Artifact(___,Name=Value)` specifies the artifact using one or more `Name=Value` arguments.

Input Arguments

`artifactType` — Type of artifact
string

Type of artifact, specified as a string. For example:

- `"sl_model_file"` for Simulink models
- `"m_file"` for MATLAB M files

For a list of valid artifact types, see "Valid Artifact Types" on page 9-2.

Example: `"sl_model_file"`

Example: `"m_file"`

Example: `"sl_test_case"`

Data Types: `string`

`artifactAddress` — Address of artifact
`padv.util.ArtifactAddress` object

Address of artifact, specified as an `padv.util.ArtifactAddress` object. Note that the address is relative to the project root.

Example:
`padv.util.ArtifactAddress(fullfile("02_Models","AHRS_Voter","specification"," AHRS_Voter.slx"))`

Data Types: `string`

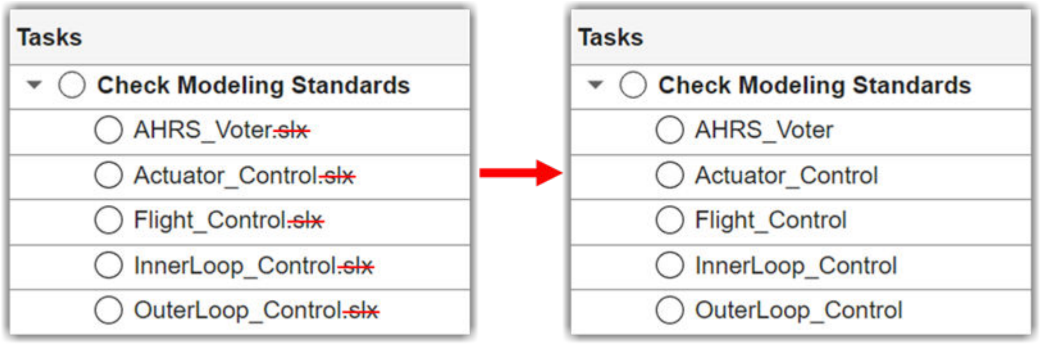
Properties

`Alias` — Human-readable name for artifact

empty string (default) | string

Human-readable name for the artifact in the Process Advisor user interface, specified as a string.

If you want to customize how artifact names appear in Process Advisor, create a custom query that updates the values of the `Alias` property for each `padv.Artifact` object that the query returns. For an example of how to update the alias to remove the `.slx` file extension for models shown in the **Tasks** column, see "Hide File Extension in Process Advisor".



Data Types: `string`

`Type` — Type of artifact

string

Type of artifact, specified as a string. For example:

- `"sl_model_file"` for Simulink models
- `"m_file"` for MATLAB M files

For a list of valid artifact types, see “Valid Artifact Types” on page 9-2.

Example: `"sl_model_file"`

Example: `"sl_test_case"`

Example: `"m_file"`

Data Types: `string`

`Parent` — Reference to parent artifact

`padv.Artifact` object

Reference to parent artifact, specified as a `padv.Artifact` object.

`ArtifactAddress` — Address of artifact in project
`padv.util.ArtifactAddress` object

Address of artifact in project, specified as a `padv.util.ArtifactAddress` object.

Object Functions

Object Function	Description
`getTypes`	Get artifact type. `TYPES = getTypes(artifactObj)`
`getKey`	Get unique key for artifact. A key is a unique address for a file. `KEY = getKey(artifactObj)`
`hasType`	Check if artifact has type. `TYPE = hasType(artifactObj)`

Examples

Run Task Associated with Model

Suppose you have a process model with several tasks, but right now you only want to run test cases associated with a single model. You can use a `padv.Artifact` object to specify the model and use the `runprocess` function to run the test cases for that model.

Open the Process Advisor example project, which contains an example process model.

```
processAdvisorExampleStart
```

The example process contains a **Run Tests** task (`padv.builtin.task.RunTestsPerTestCase`) that runs the test cases in the project.

Create a `padv.Artifact` object that represents the model that you want to run. For this example, the artifact type is `"sl_model_file"` because the artifact is a Simulink model and the address is the path to model `AHRS_Voter.slx`, relative to the project root.

```
model = padv.Artifact(...
"sl_model_file",...
fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx"));
```

Run the **Run Tests** task on the test cases associated with the model `AHRS_Voter.slx` by specifying the name-value arguments of the `runprocess` function.

```
runprocess(...
Tasks = "padv.builtin.task.RunTestsPerTestCase",...
FilterArtifact = model)
```

The build system only runs the test cases associated with the specified model.

padv.Process Class

Namespace: `padv`

Group tasks and subprocesses in process model

Description

A `padv.Process` object represents a group of tasks and subprocesses in your process model. By default, your process model has a default process `"CIPipeline"`. To create other processes in your process model, create a new process object by using the method `addProcess`. You can group tasks and other subprocesses inside a specified process by using `addTask` and `addSubprocess`. You can specify a dependency or desired execution order between tasks and subprocesses inside your process by using either `addDependsOnRelationship` or `addRunsAfterRelationship`.

The `padv.Process` class is a `handle` class.

Creation

Syntax

```
process = padv.Process(Name)
process = padv.Process( ___ ,Name=Value)
```

Description

`process = padv.Process(Name)` represents a process, named `Name`, inside a process model. Each process in the process model must have a unique `Name`.

`process = padv.Process( ___ ,Name=Value)` sets properties using one or more name-value arguments. For example, `padv.Process("myProcess",Title="My Process")` creates a process with the title `My Process` in Process Advisor.

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Properties

`DescriptionCSH` — Path to process documentation
string

Path to process documentation, returned as a string.

Example: `padv.Process("myProcess",DescriptionCSH = fullfile(pwd,"myHelpFiles","myProcessDocumentation.pdf"))`

Data Types: `string`

`DescriptionText` — Process description
string

Process description, returned as a string.

Example: `padv.Process("myProcess",DescriptionText = "This is my process.")`

Data Types: `string`

`Title` — Human readable name that appears in Process Advisor app
string

Human readable name that appears in the **Processes** drop-down menu in the Process Advisor app, returned as a string. By default, the Process Advisor app uses the `Name` property of the process as the `Title`.

Example: `padv.Process("myProcess",Title = "My Process")`

Data Types: `string`

Name — Unique identifier for process
string

Unique identifier for the process, returned as a string. When you specify the `Name`, you specify the `Name` property of the process object.

Each process in the process model must have a unique `Name`.

Example: `padv.Process("myProcess")`

Data Types: `string`

Methods

Public Methods

`addTask`	Add task to process `myProcess.addTask("myTask");`
`addSubprocess`	Add subprocess to process `myProcess.addSubprocess("mySubprocess");`

`addDependsOnRelationship`	Create dependency between two tasks
	
	`myProcess.addDependsOnRelationship(...`
	`    Source=taskB,...`
	`    Dependency=taskA);`
	
	The build system always runs the `Dependency` task before the `Source` task. Use this method when one task cannot start without another task finishing first. Otherwise, if you only want to specify a preferred task execution order, you can use `addRunsAfterRelationship` instead.

`addRunsAfterRelationship`	Specify predecessor for task
	
	`myProcess.addRunsAfterRelationship(...`
	`    Source=taskB,...`
	`    Predecessor=taskA);`
	
	When you run your process, the build system runs the `Predecessor` task before the `Source` task when possible. But if you force run the `Source` task, the build system runs that task independently. Use this method for tasks that you prefer to run in a specific order, but do not have a strict dependency. If a task must run before another task to run successfully, use `addDependsOnRelationship` instead.

Examples

Create New Process Inside Process Model

You can use `addProcess` to create a new process and add that process to the process model. `addProcess` returns a `padv.Process` object that can represent a group of tasks and subprocesses in a process model.

For example, this process model creates a new process, `ProcessA`, adds tasks to the process, and adds a dependency between those tasks.

```
function processmodel(pm)
    % Defines the project's processmodel

    arguments
        pm padv.ProcessModel
    end

    % Create and add process to process model
    processA = pm.addProcess("ProcessA");

    % Add tasks to Process A
    taskA = processA.addTask("taskA");
    taskB = processA.addTask("taskB");

    % Add dependency between tasks inside Process A
    processA.addDependsOnRelationship(...
        Source = taskB,...
        Dependency = taskA);

end
```

padv.ProcessModel

Define tasks and process for project

Description

A `padv.ProcessModel` object represents the process model that defines the tasks and process for a project. A *task* performs an action and is a single step in your process. A *process* is a series of tasks that run in a specific order. The process model defines the tasks that you can perform on the project, and the order and relationships between tasks in the process. You can use tasks and queries to dynamically perform actions and find artifacts in the project. Use the `addTask` object function to add tasks to the process model. You can use the function `runprocess` to run the tasks defined in the process model. Certain `padv.ProcessModel` properties use tokens, like `$PROJECTROOT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see "Dynamically Resolve Paths Using Tokens" on page 10-2.

Creation

Syntax

```
pm = padv.ProcessModel()
```

Description

`pm = padv.ProcessModel()` creates an empty process model object, `pm`.

Properties

`TaskNames` — Tasks added to process model object
string array

Tasks added to process model object, returned as string array.

Use the object function `addTask` to add a task instance to a process model.

Example: `["padv.builtin.task.GenerateSimulinkWebView" "padv.builtin.task.RunModelStandards"]`

Data Types: `string`

`QueryNames` — Queries added to process model object
string array

Queries added to process model object, returned as string array.

Use the object function `addQuery` to add a query instance to a process model.

Example: `["padv.builtin.query.FindModels" "padv.builtin.query.FindProjectFile"]`

Data Types: `string`

`ProcessNames` — Processes in process model
`"CIPipeline"` (default) | string

Processes in the process model, specified as a string.

Example: `["CIPipeline" "ProcessA"]`

Data Types: `string`

`DefaultQueryName` — Default query for tasks added to process model object
`"padv.builtin.query.FindProjectFile"` (default) | name of `padv.Query` query

Default query for tasks added to process model, specified as the name of a `padv.Query` query.

Example: `"padv.builtin.query.FindModels"`

Data Types: `string`

`DefaultOutputDirectory` — Default output directory for results
`fullfile("$PROJECTROOT$","PA_Results")` (default) | string array

Default output directory, specified as a string array. Set the default output directory to a path inside your project. The path can be either a relative or absolute path. Consider using the path relative to the project root to promote consistency across local environments and CI systems, and allow for more portable builds.

By default, Process Advisor and the build system output results in a folder `PA_Results` in the project root.

Example: `fullfile("$PROJECTROOT$","Process_Results")`

Data Types: `string`

`JUnitReportName` — Name of generated JUnit-style XML report
`"$TASKNAME$_$ITERATIONARTIFACT$_JUnit.xml"` (default) | string array

Name of generated JUnit-style XML report , specified as a string array.

By default, the generated JUnit report for a task has the format *`taskName_iterationArtifact`*`_JUnit.xml`.

Example: `"$TASKNAME$_$ITERATIONARTIFACT$_JUnitReport.xml"`

Data Types: `string`

`JUnitReportPath` — Location for JUnit-style XML report
`fullfile("$DEFAULTOUTPUTDIR$","junit")` (default) | string array

Location for JUnit-style XML report, specified as a string array.

Example: `fullfile("$DEFAULTOUTPUTDIR$","junit","reports")`

Data Types: `string`

`DefaultProcessId` — Name of default process for project
`"CIPipeline"` (default) | string

Name of default process for project, specified as a string.

Unless you specify a different process, the build system and Process Advisor app use this default process.

Example: "ProcessA"

Data Types: string

EnablePerformanceChecks — Turn on performance improvement checks
1 (true) (default) | 0 (false)

Turn on performance improvement checks for the process model, specified as a numeric or logical 1 (true) or 0 (false).

When EnablePerformanceChecks is true, the build system identifies and warns you about inefficient process model code. For example, the build system can generate a warning if multiple tasks in the process model use the same query but do not share the same query object.

Example: false

Data Types: logical

DefaultDryRunResults — Default task results when task dry-runs
padv.TaskResult (default) | padv.TaskResult object

Default task results when task dry-runs, specified as a padv.TaskResult object.

If you dry-run a task that does not have a dry-run behavior specified, the task returns the default dry-run results specified by DefaultDryRunResults. To specify a dry-run behavior for a task, you can use the dryRun method for class-based tasks or the DryRunAction function for function-based tasks.

By default, DefaultDryRunResults returns a padv.TaskResult object. You can create a different set of default dry-run results by creating and using a padv.TaskResult object with different property values. For example, to have the default dry-run results be failing task results with specific result values in the **Details** column, in your process model you can create a padv.TaskResult object and update the value of the DefaultDryRunResults property:

```
res = padv.TaskResult;
res.Status = padv.TaskStatus.Fail;
res.ResultValues = struct(...
    "Pass",1,...
    "Warn",2,...
    "Fail",3);

pm.DefaultDryRunResults = res;
```

Example: padv.TaskResult

RootFileName — Name of process model file
string

Name of process model file, returned as a string.

RootFileName uses processmodel.m as the name of the process model file, unless a processmodel.p file exists. If you have both a P-code file and a .m file, the P-code file takes precedence over the corresponding .m file for execution, even after modifications to the .m file.

The default name of the process model file is specified by DefaultRootFileName.

Data Types: `string`

`DefaultRootFileName` — Default name of process model file
`"processmodel.m"` (default) | string

Default name of process model file, specified as a string.

Data Types: `string`

Object Functions

`reset`	Removes tasks and queries from process model
	`pm = padv.ProcessModel();`
	`reset(pm);`

`reload`	Load process model by executing process model file for project
	`pm = padv.ProcessModel();`
	`reload(pm);`

`addProcess`	Add process to process model `processA = pm.addProcess("processA");`
`addSubprocess`	Add subprocess instance to process model `addSubprocess(pm,"MySubprocess");`

`addTask`	Add task instance to process model
	`addTask(pm,"MyCustomTask",...`
	`Action=@SayHello,...`
	`IterationQuery=padv.builtin.query.FindModels);`
	When you use `addTask` on a process model object, the function adds the task to the default process. To add a task to a specific process inside the process model, use `addTask` on the process object.
	For information, see `addTask`.

`addQuery`	Add query instance to process model `addQuery(pm,"MyCustomQuery")` For information, see `addQuery`.

`findProcess`	Find process in process model
	`pm = getprocess;`
	`ci = pm.findProcess("CIPipeline")`

`findQuery`	Find query instance by name
	`pm = padv.ProcessModel();`
	`QUERY = findQuery(pm,...`
	`"padv.builtin.query.FindModels")`

`findTask`	Find task instance by name
	
	`pm = padv.ProcessModel();`
	`TASK = findTask(pm,...`
	`"padv.builtin.task.RunModelStandards");`

`exists`	Check if process model exists for project `[FOUND, PATH] = padv.ProcessModel.exists()`

Examples

Add Tasks to Process Model Object

You can use the object function `addTask` to add the tasks to a `padv.ProcessModel` object.

Open the Process Advisor example project.

```
processAdvisorExampleStart
```

The model `AHRS_Voter` opens with the Process Advisor pane to the left of the Simulink canvas.

In the Process Advisor pane, click the **Edit process model** button to open the `processmodel.m` file for the project.

Replace the contents of the `processmodel.m` file with this code:

```
function processmodel(pm)
    arguments
        pm padv.ProcessModel
    end

    addTask(pm,"taskA");
    addTask(pm,"taskB");

end
```

The function `addTask` adds the task objects to the `padv.ProcessModel` object.

Use the function `getprocess` to get the process model object for the project.

```
pm = getprocess;
```

Get the task object for `"taskA"` defined in the current process model.

```
taskAObj = findTask(pm, "taskA");
```

`taskAObj` is a `padv.Task` object that you can use to view the properties of the task `"taskA"`.

addQuery

Namespace: `padv`

Add query instance to process model

Syntax

```
queryObj = addQuery(pm,queryNameOrInstance)
queryObj = addQuery(___,Name=Value)
```

Description

`queryObj = addQuery(pm,queryNameOrInstance)` adds the query specified by `queryNameOrInstance` to the process model. You can access the query using the query object `queryObj`.

`queryObj = addQuery(___,Name=Value)` specifies the properties of the query using one or more `Name=Value` arguments.

Input Arguments

pm — Process for project
`padv.ProcessModel` object (default) |

Process for project, specified as a `padv.ProcessModel` object.

Example: `pm = padv.ProcessModel`

`queryNameOrInstance` — Name or instance of query
string | `padv.Query` object

Name or instance of a query, specified as a string or `padv.Query` object.

Example: `"NameOfMyQuery"`

Example: `padv.builtin.query.FindModels`

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example:

`DefaultArtifactType` — Artifact type returned by query
`"padv_output_file"` (default) | valid value for the `Type` property of a `padv.Artifact` object

Artifact type returned by the query, specified as a valid value for the `Type` property of a `padv.Artifact` object.

Example: `DefaultArtifactType = "sl_model_file"`

`Title` — Human readable name
`Name` property of query (default) | string

Human readable name for the query, specified as a string. By default, the `Title` property of the query is the same as the `Name`.

Example: `Title = "My Query"`

Data Types: `string`

`FunctionHandle` — Handle to function that runs when you run query object
`function_handle`

Handle to function that runs when you run query object, specified as a `function_handle`.

When you call the `run` function on a query object, `run` runs the function specified by the `function_handle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

`Parent` — Initial query run before iteration query
`[0×0 string]` (default) | `padv.Query` object | `Name` of `padv.Query` object

Initial query run before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify a `padv.Query` object as the iteration query for a task, the `Parent` query is the initial query that the build system runs before running the specified iteration query.

For example, the built-in query`padv.builtin.query.FindModelsWithTestCases` has the `Parent` query `padv.builtin.query.FindModels`. If you specify `padv.builtin.query.FindModelsWithTestCases` as the iteration query for a task, you are specifying that you want the task to run once for each model with a test case. The build system runs the `Parent` query `padv.builtin.query.FindModels` first, to find the models in the project, and then the build system runs the iteration query `padv.builtin.query.FindModelsWithTestCases` to find the models with test cases.

The build system ignores the `Parent` query when you specify a query as an input query or dependency query for a task.

Example: `Parent = "padv.builtin.query.FindModels"`

`SortArtifacts` — Setting for automatically sorting artifacts by address
`true` or `1` (default) | `false` or `0`

Setting for automatically sorting artifacts by address, specified as a numeric or logical `1` (`true`) or `0` (`false`). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal `sortArtifacts` method in a subclass that defines a custom sort behavior.

For more information, see “Sort Artifacts in Specific Order”.

The build system automatically calls the `sortArtifacts` method when using the process model. The `sortArtifacts` method expects two input arguments: a `padv.Query` object and a list of `padv.Artifact` objects returned by the `run` function. The `sortArtifacts` method should return a list of sorted `padv.Artifact` objects.

Example: `SortArtifacts = false`

Data Types: `logical`

Output Arguments

`queryObj` — Query object
`padv.Query` object

Query object, returned as a `padv.Query` object.

For more information, see `padv.Query`.

addTask

Namespace: padv

Add task instance to process model

Syntax

```
taskObj = addTask(pm,taskNameOrInstance)
taskObj = addTask( ___ ,Name=Value)
```

Description

`taskObj = addTask(pm,taskNameOrInstance)` adds the task specified by `taskNameOrInstance` to the process model. You can access the task using the task object `taskObj`.

`taskObj = addTask( ___ ,Name=Value)` specifies the properties of the task using one or more `Name=Value` arguments.

Examples

Add Tasks to Process Model

You can use the `addTask` function to create function-based tasks directly in the process model.

Open the Process Advisor example project.

```
processAdvisorExampleStart
```

The model `AHRS_Voter` opens with the Process Advisor pane to the left of the Simulink canvas.

In the Process Advisor pane, click the **Edit process model** button to open the `processmodel.m` file for the project.

Replace the contents of the `processmodel.m` file with this code:

```
function processmodel(pm)
    arguments
        pm padv.ProcessModel
    end

    addTask(pm,"MyCustomTask",Action=@SayHello,...
        IterationQuery=padv.builtin.query.FindModels);

end

function results = SayHello(~)
    disp("Hello, World!");
    results = padv.TaskResult;
    results.ResultValues.Pass = 1;
end
```

This code adds a task, `MyCustomTask` to the process model while specifying that the task runs the function `SayHello` one time for each model found in the project. The function `SayHello` also specifies the results returned by the task.

Input Arguments

`pm` — Process for project
`padv.ProcessModel` object (default)

Process for project, specified as a `padv.ProcessModel` object.

Example: `pm = padv.ProcessModel`

`taskNameOrInstance` — Name or instance of task
string | `padv.Task` object

Name or instance of a task, specified as a string or `padv.Task` object.

Example: `"NameOfMyTask"`

Example: `padv.builtin.task.RunModelStandards`

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example:
`addTask(pm,"RunOnceForEachModel",IterationQuery=padv.builtin.query.FindModels)`

`Title` — Human readable name that appears in Process Advisor app
`Name` property of task (default) | string

Human readable name that appears in the **Tasks** column of the Process Advisor app, specified as a string. By default, the Process Advisor app uses the `Name` property of the task as the `Title`.

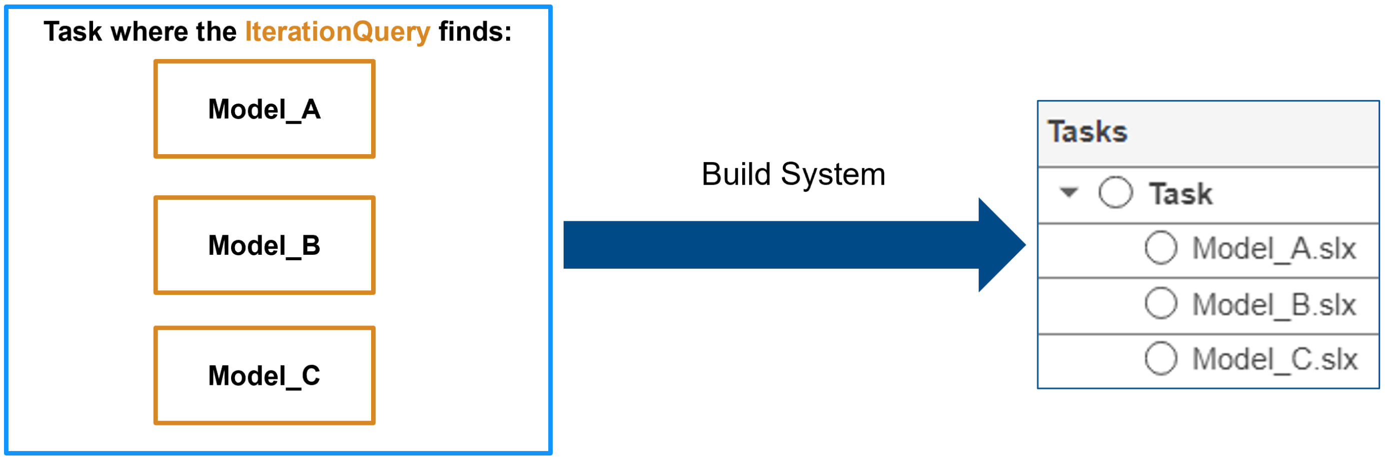
Example: `"My Task"`

Data Types: `string`

`IterationQuery` — Artifacts that task iterates over
`padv.Query` object | name of `padv.Query` object

Artifacts that task iterates over, specified as a `padv.Query` object or the name of a `padv.Query` object. By default, task objects run one time and are associated with the project. When you specify `IterationQuery`, the task runs one time *for each* artifact specified by the `padv.Query`. In the Process Advisor app, the artifacts specified by `IterationQuery` appear under task title.

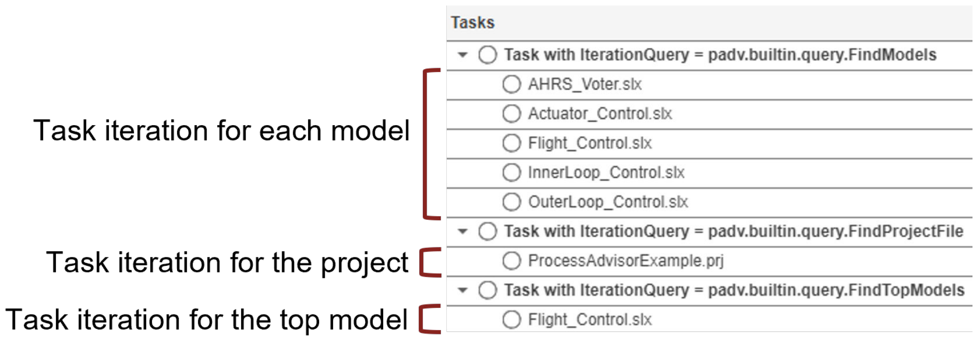
For example, if the `IterationQuery` for a task finds three models, `Model_A`, `Model_B`, and `Model_C`, the build system creates three task iterations under the title of the task in the **Tasks** column.



Each of the artifacts under the task title represents a *task iteration*.

For examples of different `IterationQuery` values:

- If you have a task where the `IterationQuery` uses `padv.builtin.query.FindModels` to find each of the models in the project, the build system creates a task iteration for each model.
- If you have a task where the `IterationQuery` uses `padv.builtin.query.FindProjectFile` to find the project file, the build system creates a task iteration for the project file.
- If you have a task where the `IterationQuery` uses `padv.builtin.query.FindTopModels` to find top models in the project, the build system creates a task iteration for each top model.


Tasks
Task with IterationQuery = padv.builtin.query.FindModels
AHRS_Voter.slx
Actuator_Control.slx
Flight_Control.slx
InnerLoop_Control.slx
OuterLoop_Control.slx
Task with IterationQuery = padv.builtin.query.FindProjectFile
ProcessAdvisorExample.prj
Task with IterationQuery = padv.builtin.query.FindTopModels
Flight_Control.slx
Task iteration for each model
Task iteration for the project
Task iteration for the top model

Example: `IterationQuery = padv.builtin.query.FindModels`

Data Types: `string`

`InputQueries` — Inputs to task
`padv.Query` object | name of `padv.Query` object | array of `padv.Query` objects

Inputs to the task, specified as:

- a `padv.Query` object
- the name of `padv.Query` object
- an array of `padv.Query` objects
- an array of names of `padv.Query` objects

By default, `padv.Task` does not have inputs. When you specify `InputQueries`, the task uses the artifacts specified by the specified query or queries as an input.

Suppose a task runs once for each model in the project and you want to provide the models as inputs to the task. If you specify `InputQueries` as the built-in query `padv.builtin.query.GetIterationArtifact`, the query returns each artifact that the tasks iterates over, which in this example is each of the models in the project.

Example: `InputQueries = padv.builtin.query.GetIterationArtifact`

`InputDependencyQuery` — Artifact dependencies for task inputs

`padv.Query` object | name of `padv.Query` object

Artifact dependencies for task inputs, specified as a `padv.Query` object or the name of a `padv.Query` object.

The build system runs the query specified by `InputDependencyQuery` to find the dependencies for the task inputs, since those dependencies can impact if task results are up-to-date. Typically, you specify `InputDependencyQuery` as `padv.builtin.query.GetDependentArtifacts` to get the dependent artifacts for each task input. For example, if you specify a model as an input to a task and you specify `InputDependencyQuery` as `padv.builtin.query.GetDependentArtifacts`, the build system can find artifacts, such as data dictionaries, that the model uses.

Example: `InputDependencyQuery = padv.builtin.query.GetDependentArtifacts`

`Action` — Function that task runs

function handle

Function that the task runs, specified as the function handle. When you run the task, the task runs the function specified by the function handle.

For example, if you want the task to run the function `myFunction`, specify `Action` as `@myFunction`.

Example: `Action = @myFunction`

Data Types: `function_handle`

`RequiredIterationArtifactType` — Artifact type that task can run on

string

Artifact type that the task can run on, specified by a string. The required iteration artifact type must be the artifact type supported by the `IterationQuery` property of the task.

For a list of valid artifact types, see "Valid Artifact Types" on page 9-2.

Example: `RequiredIterationArtifactType = "sl_model_file"`

Data Types: `string`

`Licenses` — List of licenses that task requires

string array

List of licenses that the task requires, specified as a string array.

Example: `Licenses = ["matlab_report_gen" "simulink_report_gen"]`

Data Types: `string`

`AllLicenseRequired` — Setting to require all licenses for task
`true` or `1` (default) | `false` or `0`

Setting to require all licenses for task, specified as a numeric or logical `1` (`true`) or `0` (`false`). By default, all licenses in the `Licenses` property of the task are required for the task to run. Specify `0` (`false`) if the task can run without all licenses listed in the `Licenses` property.

Example: `AllLicenseRequired = false`

Data Types: `logical`

`DescriptionText` — Task description
string

Task description, specified as a string.

Example: "This task runs myScript."

Data Types: `string`

`DescriptionCSH` — Path to task documentation
string

Path to task documentation, specified as a string.

Example: `DescriptionCSH = fullfile(pwd,"taskHelpFiles","myTaskDocumentation.pdf")`

Data Types: `string`

Output Arguments

`taskObj` — Task object
`padv.Task` object

Task object, returned as a `padv.Task` object.

For more information, see `padv.Task`.

padv.Query

Select set of artifacts from project

Description

A `padv.Query` object represents a query that you can use to select a set of artifacts from a project. Use the input arguments to define the set of artifacts that the query selects. Queries can either be function-based or class-based. Use `FunctionHandle` to specify a function for a function-based query or use inheritance for a class-based query.

Creation

Syntax

```
Q = padv.Query(Name)
Q = padv.Query( ___ ,Name = Value)
```

Description

`Q = padv.Query(Name)` creates a query object with the name `Name`.

`Q = padv.Query( ___ ,Name = Value)` specifies query properties using one or more name-value arguments. For example, `DefaultArtifactType = "sl_model_file"` changes the default artifact type for the query from a generic output file, `"padv_output_file"`, to a model file, `"sl_model_file"`.

Input Arguments

`Name` — Unique identifier for query
character vector | string

Unique identifier for query, specified as character vector or string. You can only specify a query name when you create a query object. You cannot change the query name after you create the query object.

Each query in the process model must have a unique name.

Example: `"CustomQueryForArtifacts"`

Data Types: `char` | `string`

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `DefaultArtifactType = "sl_model_file"`

`Title` — Human-readable name for query
character vector | string

Human-readable name for query, specified as character vector or string.

Example: `Title = "Custom Query for Artifacts"`

Data Types: `char` | `string`

`DefaultArtifactType` — Expected artifact type
`"padv_output_file"` (default) | valid value for the `Type` property of a `padv.Artifact` object

Expected artifact type, specified as a valid value for the `Type` property of a `padv.Artifact` object. `padv.Task` objects use the `DefaultArtifactType` to confirm that the artifacts output by the query are the types of artifacts required by the `padv.Task` object.

When you use the `run` function on a query object, the `DefaultArtifactType` is the default value for artifacts returned by the function.

Example: `DefaultArtifactType = "sl_model_file"`

`Parent` — Initial query run before iteration query
`padv.Query` object | `Name` of `padv.Query` object

Initial query run before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify a `padv.Query` object as the iteration query for a task, the `Parent` query is the initial query that the build system runs before running the specified iteration query.

For example, the built-in query `padv.builtin.query.FindModelsWithTestCases` has the `Parent` query `padv.builtin.query.FindModels`. If you specify `padv.builtin.query.FindModelsWithTestCases` as the iteration query for a task, you are specifying that you want the task to run once for each model with a test case. The build system runs the `Parent` query `padv.builtin.query.FindModels` first, to find the models in the project, and then the build system runs the iteration query `padv.builtin.query.FindModelsWithTestCases` to find the models with test cases.

The build system ignores the `Parent` query when you specify a query as an input query or dependency query for a task.

Example: `"padv.builtin.query.FindModels"`

`ShowFileExtension` — Show file extensions for returned artifacts
`0` (`false`) | `1` (`true`)

Show file extensions in the `Alias` property of returned artifacts, specified as a numeric or logical `1` (`true`) or `0` (`false`). The `Alias` property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the `Alias` property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property `ShowFileExtension` as `true`.

Example: `true`

Data Types: `logical`

`SortArtifacts` — Setting for automatically sorting artifacts by address
`true` or `1` (default) | `false` or `0`

Setting for automatically sorting artifacts by address, specified as a numeric or logical `1` (`true`) or `0` (`false`). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal `sortArtifacts` method in a subclass that defines a custom sort behavior.

For more information, see “Sort Artifacts in Specific Order”.

The build system automatically calls the `sortArtifacts` method when using the process model. The `sortArtifacts` method expects two input arguments: a `padv.Query` object and a list of `padv.Artifact` objects returned by the `run` function. The `sortArtifacts` method should return a list of sorted `padv.Artifact` objects.

Example: `SortArtifacts = false`

Data Types: `logical`

`FunctionHandle` — Handle to function that runs when you run query object
`function_handle`

Handle to function that runs when you run query object, specified as a `function_handle`.

When you call the `run` function on a query object, `run` runs the function specified by the `function_handle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

run

Namespace: padv

Return artifacts from query

Syntax

```
artifacts = run(queryObj)
artifacts = run(queryObj,inputArtifact)
```

Description

`artifacts = run(queryObj)` returns the artifacts in the project folder that match the criteria specified by the query `queryObj`.

Typically, you use queries inside your process model and the build system automatically runs the queries to find artifacts, but you can manually call the `run` function to run a query outside of your process model to confirm which artifacts the query returns. For examples of how to run specific built-in queries, see "Built-In Query Library".

`artifacts = run(queryObj,inputArtifact)` returns the artifacts in the project folder that match the criteria specified by the query `queryObj` and are associated with the artifact `inputArtifact`. If you use the query as an iteration query or dependency query, the build system can use `inputArtifact` to determine the scope of the artifacts that the query returns, which can be helpful for queries that need an input artifact from a parent query.

Examples

Test Query Outside Process Model

Although you typically use queries inside your process model, you can run queries outside of your process model to confirm which artifacts the query returns.

1. Open a project. For this example, you can open the Process Advisor example project.

   ```
   processAdvisorExampleStart
   ```

2. Create an instance of a query. For this example, you can create an instance of the built-in query `padv.builtin.query.FindArtifacts`. You can use the arguments of the query to filter the query results. For example, you can use the `IncludeLabel` argument to have the query only return artifacts that use the `Design` project label from the `Classification` project label category.

   ```
   q = padv.builtin.query.FindArtifacts(...
   IncludeLabel = {'Classification','Design'});
   ```

3. Run the query and inspect the array of artifacts that the query returns.

   ```
   artifacts = run(q)
   ```

```
artifacts = 

  1×24 Artifact array with properties:

    Type
    Parent
    ArtifactAddress
    Alias
```

Input Arguments

`queryObj` — Query object
`padv.Query` object | built-in query object

Query object, specified as a `padv.Query` object, built-in query object, or an object whose class inherits from either the `padv.Query` class or a built-in query class.

Example: `q = padv.Query("myQueryName")`

Example: `q = padv.builtin.query.FindArtifacts`

`inputArtifact` — Input artifact that query needs
`padv.Artifact`

Input artifact that the query needs, specified as a `padv.Artifact` object.

Output Arguments

`artifacts` — Artifacts that query returns
`padv.Artifact`

Artifacts that query returns, returned as an array of `padv.Artifact` objects.

padv.Subprocess

Group of tasks and subprocesses in process

Description

A `padv.Subprocess` object represents a group of tasks and subprocesses in your process. You can have multiple processes inside your process model. In your process model, use the object functions `addTask` and `addSubprocess` to group tasks and other subprocesses inside your subprocess. You can specify a dependency between tasks or a desired execution order by using either `dependsOn` or `runsAfter`. Use `dependsOn` when a subprocess cannot start without another task or subprocess finishing first. Otherwise, if you only want to specify a preferred execution order, you can use `runsAfter` instead.

Creation

Syntax

```
subprocessObject = padv.Subprocess(Name)
subprocessObject = padv.Subprocess( ___ ,Name=Value)
```

Description

`subprocessObject = padv.Subprocess(Name)` represents a subprocess, named `Name`, in a process. Each subprocess in a process must have a unique `Name`.

`subprocessObject = padv.Subprocess( ___ ,Name=Value)` sets properties using one or more name-value arguments. For example, `padv.Subprocess("mySubprocess",Title="My Subprocess")` creates a subprocess with the title `My Subprocess` in Process Advisor.

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Properties

`Name` — Unique identifier for subprocess
string

Unique identifier for subprocess, returned as a string. When you specify the `Name`, you specify the `Name` property of the subprocess object.

Each subprocess must have a unique `Name`.

Example: `padv.Subprocess("mySubprocess")`

Data Types: `string`

`Title` — Human readable name that appears in Process Advisor app
string

Human readable name that appears in the **Tasks** column of the Process Advisor app, returned as a string. By default, the Process Advisor app uses the `Name` property of the subprocess as the `Title`.

Example: `padv.Subprocess("mySubprocess",Title = "My Subprocess")`

Data Types: `string`

`DescriptionText` — Subprocess description
string

Subprocess description, returned as a string.

Example: `padv.Subprocess("mySubprocess",DescriptionText = "This is my subprocess.")`

Data Types: `string`

`DescriptionCSH` — Path to subprocess documentation
string

Path to subprocess documentation, returned as a string.

Example: `padv.Subprocess("mySubprocess",DescriptionCSH = fullfile(pwd,"subprocessHelpFiles","mySubprocessDocumentation.pdf"))`

Data Types: `string`

`RequiredIterationArtifactType` — Type of artifact
`"sl_model_file"` | `"m_file"` | `"zc_file"` | ...

Type of artifact, specified as one or more of the values listed in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow® chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table

Artifact Type	Description
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer™ architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

Example: `"m_file"`

Example: `["sl_model_file" "zc_file"]`

`LaunchToolAction` — Function that launches a tool
function handle

Function that launches a tool, returned as the function handle.

When the property `LaunchToolAction` is specified, you can point to the subprocess in the Process Advisor app and click the ellipsis (**...**) and then **Open *`Tool Name`*** to open the tool associated with the subprocess.

Example: `padv.Subprocess("mySubprocess",LaunchToolAction = @openTool)`

Data Types: `function_handle`

`LaunchToolText` — Description of action that `LaunchToolAction` property performs
`"Launch Tool"` (default) | string scalar

Description of the action that the `LaunchToolAction` property performs, returned as a string scalar.

Example: `padv.Subprocess("mySubprocess",LaunchToolAction = @openTool, LaunchToolText = "Open tool.")`

Data Types: `string`

Enabled — Controls if the `padv.Subprocess` is enabled in the process model
`true` or `1` (default) | `false` or `0`

Controls if the `padv.Subprocess` is enabled in the process model, returned as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `padv.Subprocess("mySubprocess",Enabled = false)`

Data Types: `logical`

`DryRunLicenseCheckout` — Dry-run checks out product license
`logical.empty` (default) | `true` or `1` | `false` or `0`

Dry-run checks out product license, returned as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`OutputDirectory` — Location for standard outputs that tasks in subprocess produce
string

Location for standard outputs that tasks in the subprocess produce, specified as a string.

Example: `fullfile("folder", "subfolder")`

Data Types: `string`

`CacheDirectory` — Location for additional cache files that tasks in subprocess produce
string

Location for additional cache files that tasks in the subprocess produce, specified as a string. The cache directory can contain temporary files that do not need to be either saved in the task results or archived by a CI system.

Example: `fullfile("folder", "subfolder")`

Data Types: `string`

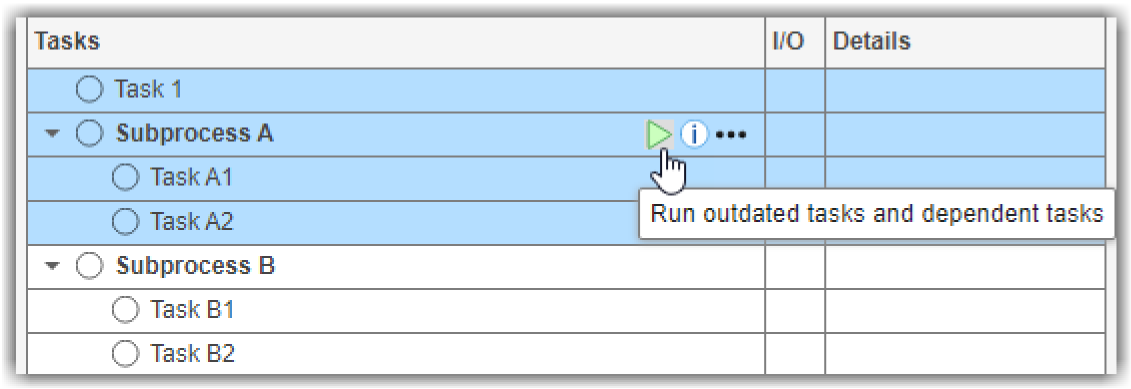
Object Functions

- `addTask(subprocessObject, taskNameOrInstance, NAME, VALUE, ...)`
- `addSubprocess(subprocessObject, subprocessNameOrInstance, NAME, VALUE, ...)`
- `dependsOn(subprocessObject, DEPENDENCIES, NAME, VALUE, ...)`
- `runsAfter(subprocessObject, PREDECESSORS, NAME, VALUE, ...)`

Examples

Group Tasks Inside Subprocess

You can use a subprocess to group related tasks, create a hierarchy of tasks, and share parts of a process. A *subprocess* is a self-contained sequence of tasks, inside a process or other subprocess, that can run standalone.



To group the tasks in your process model, in the process model, add a subprocess by using `addSubprocess` on your process model object.

```
spA = pm.addSubprocess("Subprocess A");
```

Add your tasks directly to the subprocess by using `addTask`.

```
tA1 = spA.addTask("Task A1");
tA2 = spA.addTask("Task A2");
```

Note You do not need to add the task to both the subprocess and process model.

Specify the relationship between the tasks and subprocesses in your process.

You can use either `dependsOn` or `runsAfter` to define a relationship.

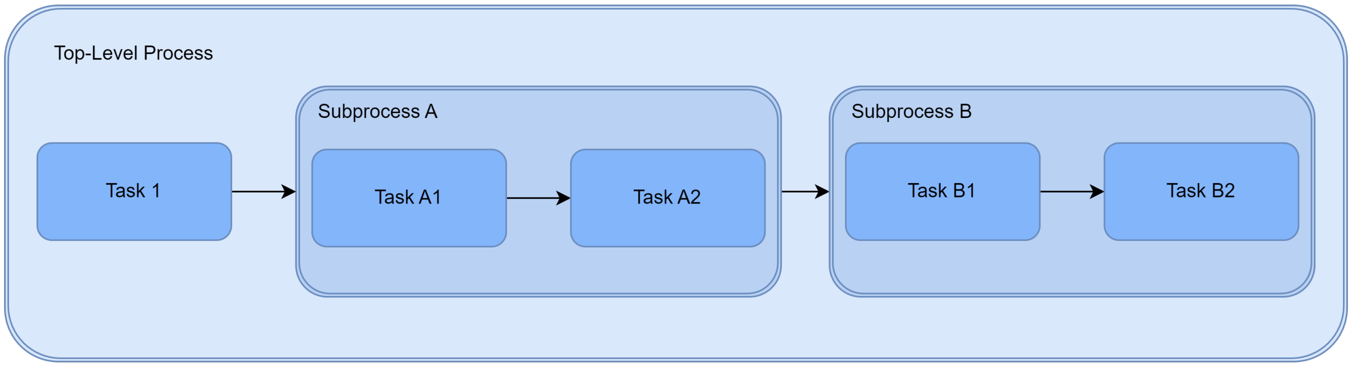
For example, the following process model defines a process in which `Task 1` runs, then `Subprocess A`, and then `Subprocess B`.

```
function processmodel(pm)
    % Defines the project's processmodel

    arguments
        pm padv.ProcessModel
    end

    t1 = pm.addTask("Task 1");

    spA = pm.addSubprocess("Subprocess A");
        tA1 = spA.addTask("Task A1");
        tA2 = spA.addTask("Task A2");
    spB = pm.addSubprocess("Subprocess B");
```

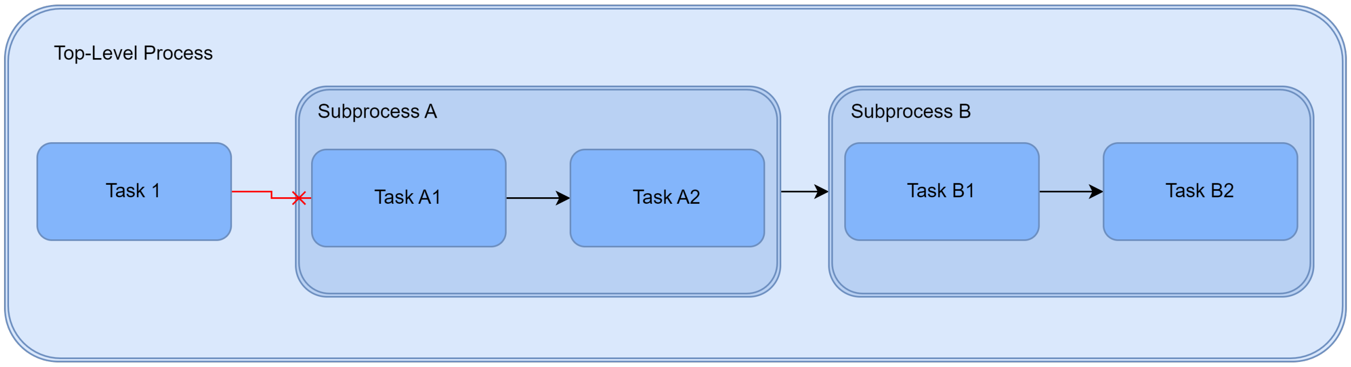
```
        tB1 = spB.addTask("Task B1");
        tB2 = spB.addTask("Task B2");

    % Relationships
    spA.dependsOn(t1);
        tA2.dependsOn(tA1);
    spB.dependsOn(spA);
        tB2.dependsOn(tB1);

end
```

The build system executes each of the tasks inside a subprocess before existing the subprocess.

The following diagram shows a graphical representation of the relationships defined by that process model.



Note Relationships cannot cross any subprocess boundaries. For example, in this process model, you cannot directly specify that `Task A1` depends on `Task 1` because that relationship would enter into `Subprocess A`, crossing the subprocess boundary.



padv.Task Class

Namespace: `padv`

Single step in process

Description

A `padv.Task` object represents a single step in a `padv.ProcessModel` process. For example, a `padv.Task` object could represent a step like checking modeling standards, running tests, generating code, or performing a custom action. `padv.Task` objects can accept project artifacts as inputs, perform actions, generate assessments, and return project artifacts as outputs. You can add a task to your process model by using the function `addTask`. You can specify task inputs by using `addInputQueries`. You can specify a dependency between tasks or a desired execution order by using either `dependsOn` or `runsAfter`. Use `dependsOn` when a task cannot start without another task finishing first. Otherwise, if you only want to specify a preferred execution order, you can use `runsAfter` instead. You can execute tasks as part of a pipeline. Use the `runprocess` function to generate and run a pipeline of tasks.

Creation

Syntax

```
taskObject = padv.Task(Name)
taskObject = padv.Task( ___ ,Name=Value)
```

Description

`taskObject = padv.Task(Name)` represents a task, named `Name`, in a `padv.ProcessModel` process. Each task object in a process must have a unique `Name`.

`taskObject = padv.Task( ___ ,Name=Value)` sets properties using one or more name-value arguments. For example, `padv.Task("myTask",IterationQuery=padv.builtin.query.FindModels)` creates a task object named `myTask` that runs once for each model.

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Properties

Name — Unique identifier for task in process
string

Unique identifier for task in process, specified as a string. When you specify the `Name`, you specify the `Name` property of the task object.

Each task in the process model must have a unique `Name`. After you specify a `Name` for a `padv.Task` object, you cannot change the `Name`.

Example: `padv.Task("myTask")` creates a task with the `Name` `myTask`

Data Types: `string`

`Title` — Human readable name that appears in Process Advisor app
string

Human readable name that appears in the **Tasks** column of the Process Advisor app, specified as a string. By default, the Process Advisor app uses the `Name` property of the task as the `Title`.

Example: `padv.Task("myTask",Title = "My Task")`

Data Types: `string`

`DescriptionText` — Task description
string

Task description, specified as a string.

Example: `padv.Task("myTask",DescriptionText = "This is my task.")`

Data Types: `string`

`DescriptionCSH` — Path to task documentation
string

Path to task documentation, specified as a string.

Example: `padv.Task("myTask",DescriptionCSH = fullfile(pwd,"taskHelpFiles","myTaskDocumentation.pdf"))`

Data Types: `string`

`Action` — Function that task can run
function handle

Function that task can run, specified as the function handle.

If the task is defined in a function, the build system runs the function specified by `Action`. If the task is defined in a class, the build system ignores the `Action` and runs the `run` method for the class instead. The built-in tasks are defined in classes, so the build system calls the `run` method for those tasks.

Example: `padv.Task("myTask",Action = @myFunction)`

Data Types: `function_handle`

`DryRunAction` — Function that task can use during dry-run
function handle

Function that task can use during dry-run, specified as the function handle.

If the task is defined in a function, the build system dry-runs by calling the function specified by `DryRunAction`. If the task is defined in a class, the build system ignores the `DryRunAction` and dry-runs by calling the `dryRun` method for the class instead. The built-in tasks are defined in classes, so the build system calls the `dryRun` method for those tasks.

Example: `padv.Task("myTask",DryRunAction = @myFunction)`

Data Types: `function_handle`

`RequiredIterationArtifactType` — Artifact type that task can run on
`"sl_model_file"` | `"m_file"` | `"zc_file"` | ...

Type of artifact, specified as one or more of the values listed in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file

Artifact Type	Description
"sl_test_iteration"	Simulink Test iteration
"sl_test_iteration_result"	Simulink Test iteration result
"sl_test_report_file"	Simulink Test result report
"sl_test_result_file"	Simulink Test result file
"sl_test_resultset"	Simulink Test result set
"sl_test_seq"	Test Sequence
"sl_test_suite"	Simulink Test suite
"sl_test_suite_result"	Simulink Test suite result
"zc_block_diagram"	System Composer architecture
"zc_component"	System Composer architecture component
"zc_file"	System Composer architecture file

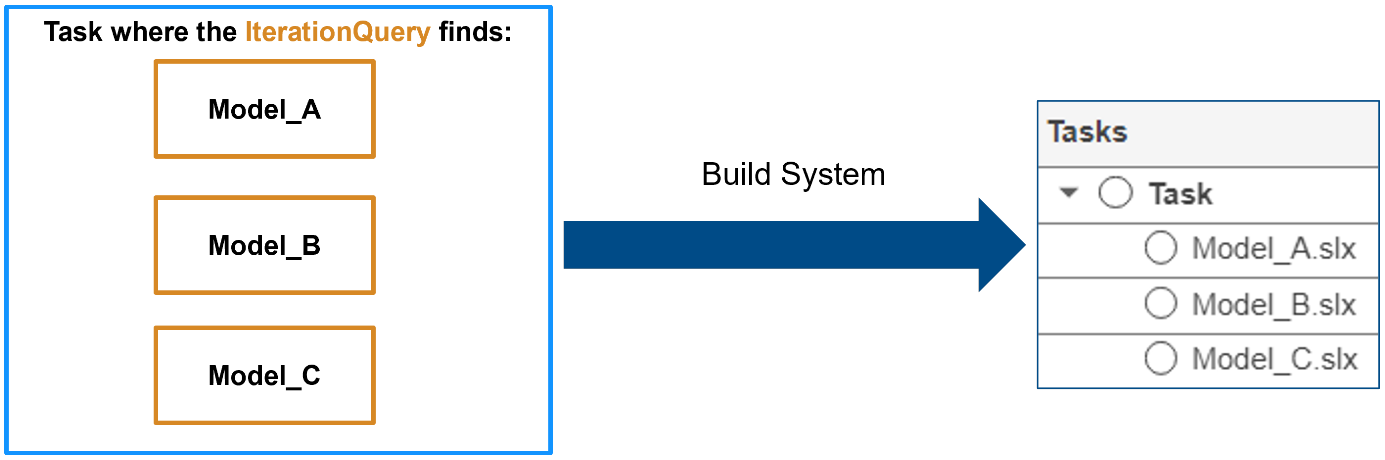
Example: `padv.Task("myTask",RequiredIterationArtifactType = "sl_model_file")`

Data Types: `string`

`IterationQuery` — Artifacts that task iterates over
`padv.Query` object | name of `padv.Query` object

Artifacts that task iterates over, specified as a `padv.Query` object or the name of a `padv.Query` object. By default, task objects run one time and are associated with the project. When you specify `IterationQuery`, the task runs one time *for each* artifact returned by the `padv.Query`. In the Process Advisor app, the artifacts returned by `IterationQuery` appear under task title.

For example, if the `IterationQuery` for a task finds three models, `Model_A`, `Model_B`, and `Model_C`, the build system creates three task iterations under the title of the task in the **Tasks** column.

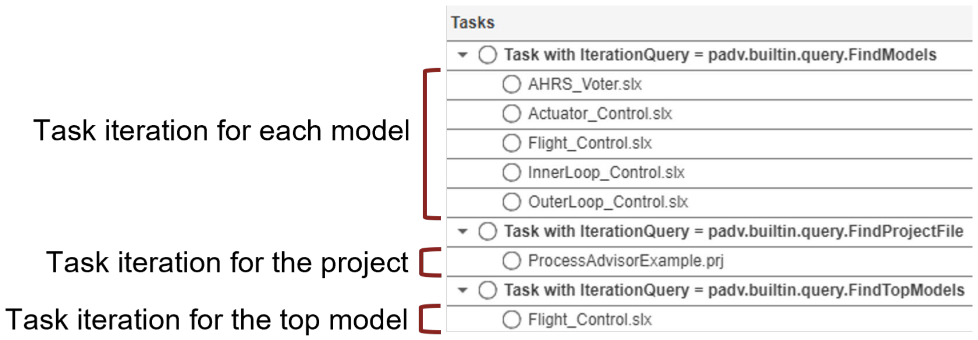


Each of the artifacts under the task title represents a *task iteration*.

For examples of different `IterationQuery` values:

- If you have a task where the `IterationQuery` uses `padv.builtin.query.FindModels` to find each of the models in the project, the build system creates a task iteration for each model.

- If you have a task where the `IterationQuery` uses `padv.builtin.query.FindProjectFile` to find the project file, the build system creates a task iteration for the project file.
- If you have a task where the `IterationQuery` uses `padv.builtin.query.FindTopModels` to find top models in the project, the build system creates a task iteration for each top model.


Task iteration for each model
Task iteration for the project
Task iteration for the top model

Tasks
- Task with IterationQuery = padv.builtin.query.FindModels
  - AHRS_Voter.slx
  - Actuator_Control.slx
  - Flight_Control.slx
  - InnerLoop_Control.slx
  - OuterLoop_Control.slx
- Task with IterationQuery = padv.builtin.query.FindProjectFile
  - ProcessAdvisorExample.prj
- Task with IterationQuery = padv.builtin.query.FindTopModels
  - Flight_Control.slx

Example: `padv.Task("myTask",IterationQuery = padv.builtin.query.FindModels)`

Data Types: `string`

`InputDependencyQuery` — Artifact dependencies for task inputs
`padv.Query` object | name of `padv.Query` object

Artifact dependencies for task inputs, specified as a `padv.Query` object or the name of a `padv.Query` object.

The build system runs the query specified by `InputDependencyQuery` to find the dependencies for the task inputs, since those dependencies can impact if task results are up-to-date. Typically, you specify `InputDependencyQuery` as `padv.builtin.query.GetDependentArtifacts` to get the dependent artifacts for each task input. For example, if you specify a model as an input to a task and you specify `InputDependencyQuery` as `padv.builtin.query.GetDependentArtifacts`, the build system can find artifacts, such as data dictionaries, that the model uses.

Example: `InputDependencyQuery = padv.builtin.query.GetDependentArtifacts`

`IncludeMatlabWarningsInResults` — Automatically include number of MATLAB warning messages in `padv.TaskResult`
`false` or `0` (default) | `true` or `1`

Automatically include the number of MATLAB warning messages in the `padv.TaskResult`, specified as a numeric or logical `0` (`false`) or `1` (`true`).

Example: `true`

Data Types: `logical`

`Licenses` — List of licenses that task requires
string array

List of licenses that the task requires, specified as a string array.

Example: `padv.Task("myTask",Licenses = ["matlab_report_gen" "simulink_report_gen"])`

Data Types: `string`

Products — List of products that must be installed to run task
string array

List of products that must be installed to run the task, specified as a string array.

Data Types: string

AllLicenseRequired — Setting to require all licenses for task
true or 1 (default) | false or 0

Setting to require all licenses for task, specified as a numeric or logical 1 (true) or 0 (false). By default, all licenses in the Licenses property of the task are required for the task to run. Specify 0 (false) if the task can run without all licenses listed in the Licenses property.

Example: padv.Task("myTask",AllLicenseRequired = false)

Data Types: logical

LaunchToolAction — Function that launches a tool
function handle | cell array of function_handle objects

Function that launches a tool, specified as the function handle or a cell array of function_handle objects. For each action that you specify in LaunchToolAction, you must have corresponding text specified in LaunchToolText.

When the property LaunchToolAction is specified, you can point to the task in the Process Advisor app and click the ellipsis (**...**) and then **Open *Tool Name*** to open the tool associated with the task.

For tasks that are not built-in tasks, the task options show the ellipsis (**...**) and then **Launch Tool**.

Example: @openTool

Example: {@openToolA,@openToolB}

Data Types: cell | function_handle

LaunchToolText — Description of action that LaunchToolAction property performs
"Launch Tool" (default) | string

Description of the action that the LaunchToolAction property performs, specified as a string. For each action that you specify in LaunchToolAction, you must have corresponding text specified in LaunchToolText.

Example: "Open Tool"

Example: ["Open Tool A","Open Tool B"]

Data Types: string

Enabled — Controls if the padv.Task is enabled in the process model
true or 1 (default) | false or 0

Controls if the padv.Task is enabled in the process model, specified as a numeric or logical 1 (true) or 0 (false).

Example: padv.Task("myTask",Enabled = false)

Data Types: logical

`AlwaysRun` — Always force task to run, even if the task results are already up to date
`false` or `0` (default) | `true` or `1`

Always force task to run, even if the task results are already up to date, specified as a numeric or logical `0` (`false`) or `1` (`true`).

Example: `padv.Task("myTask",AlwaysRun = true)`

Data Types: `logical`

`TrackOutputs` — Track changes to output files
`true` or `1` (default) | `false` or `0`

Track changes to output files, specified as a numeric or logical `1` (`true`) or `0` (`false`).

By default, the build system tracks changes to outputs files from tasks unless the files are outside the project. If you make a change to an output file, the task status are results are marked as outdated. If you specify `TrackOutputs` as `false`, changes that you make to the task output files do not make the task status and results outdated.

For more information, see "Turn Off Change Tracking for Task Outputs".

Example: `false`

Data Types: `logical`

`DryRunLicenseCheckout` — Dry-runs check out product licenses associated with tasks in process
`logical.empty` (default) | `true` or `1` | `false` or `0`

Dry-runs check out product licenses associated with tasks in process, returned as a numeric or logical `1` (`true`) or `0` (`false`).

To perform a dry-run, you can specify the `runprocess` argument `DryRun` as `true`.

Example: `true`

Data Types: `logical`

`InputQueries` — Inputs to task
`padv.Query` object | name of `padv.Query` object | array of `padv.Query` objects

Inputs to the task, specified as:

- a `padv.Query` object
- the name of `padv.Query` object
- an array of `padv.Query` objects
- an array of names of `padv.Query` objects

By default, `padv.Task` does not have inputs. When you specify `InputQueries`, the task uses the artifacts returned by the specified query or queries as inputs.

Suppose a task runs once for each model in the project and you want to provide the models as inputs to the task. If you specify `InputQueries` as the built-in query `padv.builtin.query.GetIterationArtifact`, the query returns each artifact that the tasks iterates over, which in this example is each of the models in the project.

To add an input query to an existing task object, you can use `addInputQueries`.

Example: `padv.Task("myTask",InputQueries = padv.builtin.query.GetIterationArtifact)`

`OutputDirectory` — Location for standard outputs that the task produces
`""` (default) | string array

Location for standard outputs that the task produces, specified as a string.

Built-in tasks automatically specify `OutputDirectory`. If you do not specify `OutputDirectory` for a custom task, the build system stores task outputs in the `DefaultOutputDirectory` specified by `padv.ProcessModel`.

Data Types: `string`

`CacheDirectory` — Location for additional cache files that the task generates
string array

Location for additional cache files that the task generates, specified as a string. The cache directory can contain temporary files that do not need to be either saved in the task results or archived by a CI system.

Data Types: `string`

`CISupportOutputsForTask` — List of CI aware result file types generated for task
`"JUnit"` (default) | string array

List of CI aware result file types to be generated for task, specified as a string array.

Data Types: `string`

`CISupportOutputsByTask` — List of CI aware result file types generated by task
empty string (default) | string array

List of CI aware result file types generated by task, specified as a string array.

Data Types: `string`

Methods

Object Functions

Object Function	Description
`addInputQueries`	Add the input artifacts returned by `inputQueries` as inputs to the task represented by `taskObj`. `addInputQueries(taskObj,inputQueries)`

Object Function	Description
`dependsOn`	Create a dependency between a task, `taskObj`, and dependencies, `dependencies`. `dependsOn(taskObj,dependencies)` The build system always runs the `dependencies` before the `taskObj`. Use `dependsOn` when one task cannot start without another task finishing first. Otherwise, if you only want to specify a preferred task execution order, you can use `runsAfter` instead.

`dryRun`	Dry-run the task to validate task inputs and generate representative task outputs without actually running the task.The `dryRun` method runs on the current task instance `this` with task inputs `inputArtifacts` and returns a task result `result`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. By default, the task returns the default dry-run results specified by the `padv.ProcessModel` property `DefaultDryRunResults`. If you inherit from this class, make sure to use the same method signature inside your custom task:
	
	`function result = dryRun(this, inputArtifacts)`
	`    ...`
	`end`

`run`	Run task represented by `taskObj`.
	
	`taskResult = run(taskObj)`
	
	If the task requires inputs, specify the inputs using `inputArtifacts`.
	
	`taskResult = run(taskObj,inputArtifacts)`

`runsAfter`	Specify the preferred execution order for tasks by specifying the tasks, `predecessors`, that a task, `taskObj`, should run after. `runsAfter(taskObj,predecessors)` When you run your process, the build system runs the `predecessors` before the `taskObj` when possible. But if you force run the `taskObj`, the build system runs that task independently. Use `runsAfter` for tasks that you prefer to run in a specific order, but do not have a strict dependency. If a task must run before another task to run successfully, use `dependsOn` instead.

Examples

Create Task Objects and Add Tasks to Process Model

You can use `padv.Task` to create task objects and then use the `addTask` function to add the task objects to the `padv.ProcessModel` object.

Open the Process Advisor example project.

```
processAdvisorExampleStart
```

The model `AHRS_Voter` opens with the Process Advisor pane to the left of the Simulink canvas.

In the Process Advisor pane, click the **Edit process model** button to open the `processmodel.m` file for the project.

Replace the contents of the `processmodel.m` file with this code:

```
function processmodel(pm)
    arguments
        pm padv.ProcessModel
    end

    taskA = padv.Task("taskA");
    taskB = padv.Task("taskB");

    runsAfter(taskB,taskA);

    addTask(pm,taskA);
    addTask(pm,taskB);

end
```

This code uses `padv.Task` to create two task objects: `taskA` and `taskB`.

The object function `runsAfter` specifies that `taskB` should run after `taskA`.

The function `addTask` adds the task objects to the `padv.ProcessModel` object.

addInputQueries

Namespace: padv

Add input artifacts as inputs to task

Syntax

`addInputQueries(taskObj,inputQueries)`

Description

`addInputQueries(taskObj,inputQueries)` adds the input artifacts returned by `inputQueries` as inputs to the task represented by `taskObj`.

If the task already has input queries specified, `addInputQueries` adds `inputQueries` to the list of input queries in the `InputQueries` property.

Examples

Add Inputs to Task

Use `addInputQueries` to specify the models in the project as inputs to a task.

Create a new `padv.Task` object `myTaskObj` that represents a task named `runForEachModel`.

```
myTaskObj = padv.Task("runForEachModel");
```

By default, the task does not have inputs.

Use the function `addInputQueries` to add the built-in query `padv.builtin.query.FindModels` as the input query for the task.

```
addInputQueries(myTaskObj,padv.builtin.query.FindModels);
```

When you run the task defined by `myTaskObj`, the query `padv.builtin.query.FindModels` finds each model in the project and provides the models as the input artifacts for the task.

Input Arguments

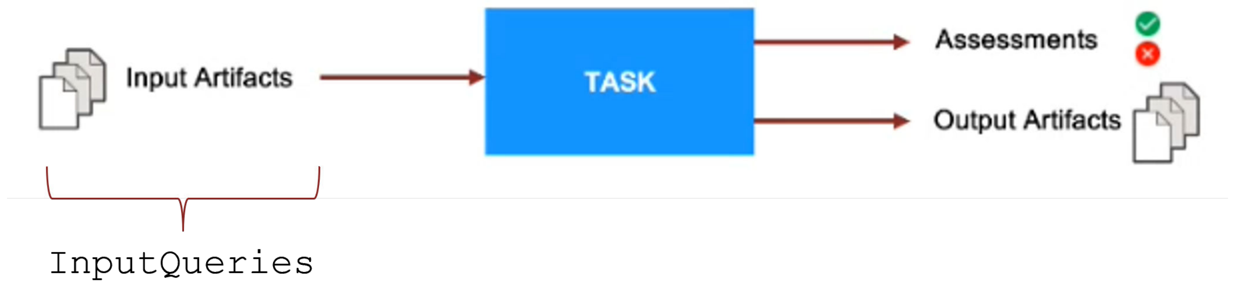
`taskObj` — Task object that represents task
`padv.Task` object

Task object that represents a task, specified as a `padv.Task` object.

Example: `myTaskObj = padv.Task("myTask");`

`inputQueries` — Queries that get input artifacts for task
`padv.Query` object | array of `padv.Query` objects

A query or queries that get the input artifacts for a task, specified as a `padv.Query` object or an array of `padv.Query` objects. Each artifact that the query or queries return becomes an input to the task.



For example, if you specify the `InputQueries` property for a task as the query `padv.builtin.query.FindModels`, the query returns each model and the models become input artifacts for the task.

Note You can only specify the following queries for the `inputQueries` argument:

- `padv.builtin.query.FindArtifacts`
- `padv.builtin.query.FindFileWithAddress`
- `padv.builtin.query.FindModels`
- `padv.builtin.query.FindProjectFile`
- `padv.builtin.query.FindRequirements`
- `padv.builtin.query.FindRequirementsForModel`
- `padv.builtin.query.FindTestCasesForModel`
- `padv.builtin.query.FindTopModels`
- `padv.builtin.query.GetDependentArtifacts`
- `padv.builtin.query.GetIterationArtifact`
- `padv.builtin.query.GetOutputsOfDependentTask`

You cannot specify the following queries for `inputQueries`:

- `padv.builtin.query.FindFilesWithLabel`
- `padv.builtin.query.FindModelsWithLabel`
- `padv.builtin.query.FindModelsWithTestCases`
- `padv.builtin.query.FindRefModels`

Example: `addInputQueries(myTaskObj,padv.builtin.query.FindModels)`

Example: `addInputQueries(myTaskObj,[padv.builtin.query.GetIterationArtifact,padv.builtin.query.GetDependentArtifacts])`

dependsOn

Namespace: `padv`

Create dependency between tasks

Syntax

```
dependsOn(taskObj,dependencies)
dependsOn(___,Name=Value)
```

Description

`dependsOn(taskObj,dependencies)` creates a dependency between `taskObj` and `dependencies`. `taskObj` runs only after the tasks specified by `dependencies` run and return a task status.

`dependsOn(___,Name=Value)` specifies how the build system handles dependencies using one or more `Name=Value` arguments.

Note You can specify the relationship between two tasks as *either* a `dependsOn` relationship or a `runsAfter` relationship, but not both.

If you define multiple relationships between the same tasks, the build system only uses the most recent relationship and ignores previous relationships. For example:

```
dependsOn(taskA, taskB)
dependsOn(taskB, taskA) % build system only uses this relationship
```

Examples

Create Dependency Between Two Tasks

Use the `dependsOn` function to create a dependency between two tasks in a process model.

Open the Process Advisor example project.

```
processAdvisorExampleStart
```

Open the `processmodel.m` file. The file is at the root of the project.

Replace the contents of the `processmodel.m` file with the following code:

```
function processmodel(pm)
    arguments
        pm padv.ProcessModel
    end

    TaskA = padv.Task("TaskA");
    TaskB = padv.Task("TaskB");

    dependsOn(TaskB,TaskA);

    addTask(pm,TaskA);
    addTask(pm,TaskB);

end
```

This code uses `padv.Task` to create two task objects: `TaskA` and `TaskB`.

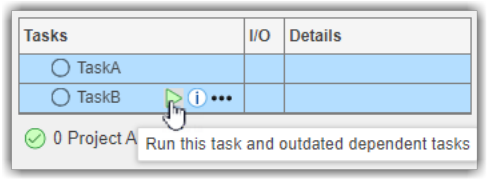
The object function `dependsOn` specifies that `TaskB` depends on `TaskA`.

The function `addTask` adds the task objects to the `padv.ProcessModel` object.

Open the Process Advisor app. In the MATLAB Command Window, enter:

```
processAdvisorWindow
```

In the **Tasks** column, point to the run button for **TaskB**. The Process Advisor app automatically highlights both tasks since **TaskA** is a dependent task. If you click the run button for **TaskB**, **TaskA** will run before **TaskB**.



Input Arguments

`taskObj` — Task object that represents task
`padv.Task` object

Task object that represents a task, specified as a `padv.Task` object.

Example: `myTaskObj = padv.Task("myTask");`

`dependencies` — Tasks that need to run before `taskObj` runs
string | character vector | `padv.Task` object

Tasks that need to run before `taskObj` runs, specified as either:

- The name of a task, specified as a string or character vector.
- A `padv.Task` object.

Example: `dependsOn(TaskB,"TaskA")`

Example: `dependsOn(TaskB,TaskA)`

Data Types: `char` | `string`

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `dependsOn(TaskB,TaskA,WhenStatus=["Pass","Fail"])`

`IterationArtifactMatching` — Setting that controls which dependent task iterations run

`true` or `1` (default) | `false` or `0`

Setting that controls which dependent task iterations run, specified as a numeric or logical `1` (`true`) or `0` (`false`):

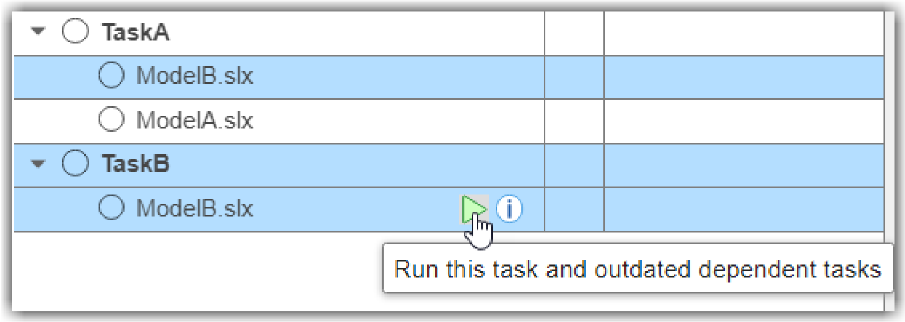
- `true` — When the build system runs the dependencies of a task, the build system runs only the task iterations that the tasks have in common.
- `false` — When the build system runs the dependencies of a task, the build system runs all task iterations. This behavior is useful when you have a task that creates new project artifacts and a task that runs on each artifact in the project. The second task depends on all project artifacts generated by the first task.

For example, suppose you have two tasks: `TaskA` and `TaskB`:

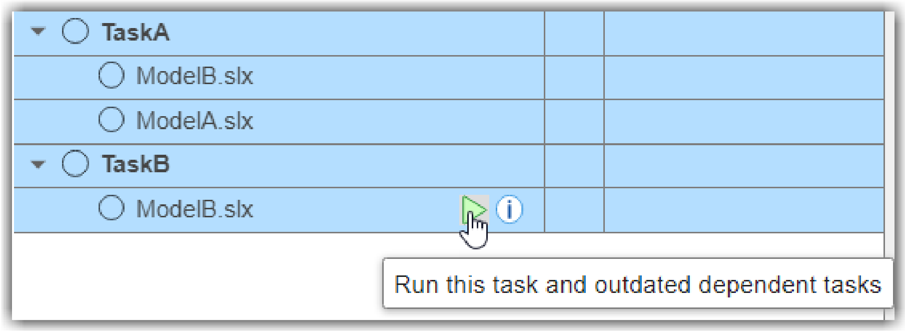
- `TaskA` runs on `ModelA` and `ModelB`.
- `TaskB` runs only on `ModelB` and depends on `TaskA`.

If you run `TaskB` and:

- `IterationArtifactMatching` is `true`, `TaskA` runs only on `ModelB`.



- `IterationArtifactMatching` is `false`, `TaskA` runs on both `ModelA` and `ModelB`.



Example: `dependsOn(TaskB,TaskA,IterationArtifactMatching=false)`

Data Types: `logical`

`WhenStatus` — Setting that controls when dependencies run
`"Pass"` (default) | `["Pass","Fail"]` | `["Pass","Fail","Error"]`

Setting that controls when dependencies run, specified as either:

- `"Pass"` — Only run the task if the dependencies pass. For example, if `TaskB` depends on `TaskA`, `TaskA` needs to pass before `TaskB` runs. If `TaskA` fails or errors, `TaskB` does not run.
- `["Pass","Fail"]` — Only run the task if the dependencies either pass or fail. For example, if `TaskB` depends on `TaskA`, `TaskA` needs to either pass or fail before `TaskB` runs. If `TaskA` errors, `TaskB` does not run.
- `["Pass","Fail","Error"]` — The task runs, even if the dependencies fail or error. For example, if `TaskB` depends on `TaskA`, `TaskA` can pass, fail, or error and `TaskB` still runs.

Example: `dependsOn(TaskB,TaskA,WhenStatus=["Pass","Fail"])`

Data Types: `string`

run

Namespace: `padv`

Run task

Syntax

```
taskResult = run(taskObj)
taskResult = run(taskObj,inputArtifacts)
```

Description

`taskResult = run(taskObj)` runs the task represented by `taskObj` and returns the result from the task.

How a task runs depends on how the you define the task. You can define tasks using a function or a class:

- Function-based tasks — Runs the function specified by the `Action` property of the task.
- Class-based task — Runs the `run` function implemented inside the class definition.

By default, when you create a `padv.Task` object, the task is a function-based task, even if you do not specify an `Action` property for the task.

`taskResult = run(taskObj,inputArtifacts)` uses the artifacts specified by `inputArtifacts` as inputs to the task. The `InputQueries` property of the task specifies the query that provides the `inputArtifacts` for the task.

Input Arguments

`taskObj` — Task object that represents task
`padv.Task` object

Task object that represents a task, specified as a `padv.Task` object.

Example: `myTaskObj = padv.Task("myTask");`

`inputArtifacts` — Artifacts that are inputs to task
cell array of `padv.Artifact` objects

Artifacts that are inputs to the task, specified as a cell array of `padv.Artifact` objects.

If you specified the `InputQueries` property for a task, the `InputQueries` automatically passes a cell array of `padv.Artifact` objects to `inputArtifacts` when you run the task.

Output Arguments

`taskResult` — Result from task
`TaskResult` object

Result from the task, returned as a `TaskResult` object.

runsAfter

Namespace: `padv`

Specify preferred execution order for tasks

Syntax

```
runsAfter(taskObj,predecessors)
runsAfter( ___ ,Name=Value)
```

Description

`runsAfter(taskObj,predecessors)` specifies a preferred execution order for tasks. If possible, the build system runs the predecessor tasks, specified by `predecessors`, before the task represented by `taskObj`.

`runsAfter( ___ ,Name=Value)` specifies how the build system handles the preferred execution order using one or more `Name=Value` arguments.

Note You can specify the relationship between two tasks as *either* a `dependsOn` relationship or a `runsAfter` relationship, but not both.

If you define multiple relationships between the same tasks, the build system only uses the most recent relationship and ignores previous relationships. For example:

```
runsAfter(taskA, taskB)
runsAfter(taskB, taskA) % build system only uses this relationship
```

Examples

Specify Preferred Execution Order for Two Tasks

Use the `runsAfter` function to specify that one task should run after another task.

Open the Process Advisor example project.

```
processAdvisorExampleStart
```

Open the `processmodel.m` file. The file is at the root of the project.

Replace the contents of the `processmodel.m` file with the following code:

```
function processmodel(pm)
    arguments
        pm padv.ProcessModel
    end

    FirstTask = padv.Task("FirstTask");
    SecondTask = padv.Task("SecondTask");

    runsAfter(SecondTask,FirstTask);

    addTask(pm,FirstTask);
    addTask(pm,SecondTask);

end
```

This code uses `padv.Task` to create two task objects: `FirstTask` and `SecondTask`.

The object function `runsAfter` specifies that `SecondTask` should run after `FirstTask`.

The function `addTask` adds the task objects to the `padv.ProcessModel` object.

Open the Process Advisor app. In the MATLAB Command Window, enter:

```
processAdvisorWindow
```

In the toolstrip, click the **Run All** button. You can see that **SecondTask** runs after **FirstTask**.

Input Arguments

`taskObj` — Task object that represents task

`padv.Task` object

Task object that represents a task, specified as a `padv.Task` object.

Example: `myTaskObj = padv.Task("myTask");`

`predecessors` — Tasks that should run before `taskObj` runs

string | character vector | `padv.Task` object

Tasks that should run before `taskObj` runs, specified as either:

- The name of a task, specified as a string or character vector.
- A `padv.Task` object.

Example: `runsAfter(SecondTask,"FirstTask")`

Example: `runsAfter(SecondTask,FirstTask)`

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `runsAfter(SecondTask,FirstTask,StrictOrdering=true)`

`IterationArtifactMatching` — Setting that controls which predecessor task iterations run

`true` or `1` (default) | `false` or `0`

Setting that controls which predecessor task iterations run, specified as a numeric or logical `1` (`true`) or `0` (`false`):

- `true` — When the build system runs the predecessors of a task, the build system runs only the task iterations that the tasks have in common.
- `false` — When the build system runs the predecessor of a task, the build system runs all task iterations. This behavior is useful when you have a task that creates new project artifacts and a task that runs on each artifact in the project. The second task should run after all project artifacts are generated by the first task.

For example, suppose you have two tasks: `FirstTask` and `SecondTask`:

- `FirstTask` runs on `ModelA` and `ModelB`.
- `SecondTask` runs only on `ModelB` and should run after on `FirstTask`.

If you run `SecondTask` and:

- `IterationArtifactMatching` is `true`, `FirstTask` runs only on `ModelB`.
- `IterationArtifactMatching` is `false`, `FirstTask` runs on both `ModelA` and `ModelB`.

Example: `runsAfter(SecondTask,FirstTask,IterationArtifactMatching=false)`

Data Types: `logical`

`StrictOrdering` — Setting that controls whether build system ignores circular relationships between tasks
`false` or `0` (default) | `true` or `1`

Setting that controls whether the build system ignores circular relationships between tasks, specified as a numeric or logical `0` (`false`) or `1` (`true`). By default, if you specify a circular relationship between tasks, the build system ignores the relationship. For example, if you specify both `runsAfter(SecondTask,FirstTask)` and `runsAfter(FirstTask,SecondTask)`, the build system ignores the `runsAfter` relationship.

If you specify `StrictOrdering` as `true`, the build system generates an error when you try to run tasks that have a circular relationship.

Example: `runsAfter(SecondTask,FirstTask,StrictOrdering=true)`

Data Types: `string`

padv.TaskResult

Create and access results from task

Description

A `padv.TaskResult` object represents the results from a task. The `run` function of a `padv.Task` creates a `padv.TaskResult` object that you can use to access the results from the task. When you create a custom task, you can specify the results from your custom task. You can also use the function `getProcessTaskResults` to view a list of the last task results for a project. The Process Advisor app uses task results to determine the task statuses, output artifacts, and detailed task results that appear in the **Tasks**, **I/O**, and **Details** columns of the app.

Creation

Syntax

`resultObj = padv.TaskResult()`

Description

`resultObj = padv.TaskResult()` creates a result object `resultObj` that represents the results from a task.

Properties

`Status` — Task result status
`Pass` (default) | `Fail` | `Error`

Task result status, returned as:

- `Pass` — A passing task status. The task completed successfully without failures or errors.
- `Fail` — A failing task status. The task completed, but the results were not successful.
- `Error` — An error task status. The task generated an error and did not complete.

The `Status` property determines the task status shown in the **Tasks** column in the Process Advisor app.

For custom tasks, you can specify the task result status as either:

- `padv.TaskStatus.Pass` — Sets the `Status` property to `Pass`.
- `padv.TaskStatus.Fail` — Sets the `Status` property to `Fail`.
- `padv.TaskStatus.Error` — Sets the `Status` property to `Error`.

For example, `taskResult.Status = padv.TaskStatus.Fail` sets the `Status` property of the task result object to `Fail` to represent a failing task status.

Example: `Fail`

`OutputArtifacts` — Artifacts created by task
`padv.Artifact` object | array of `padv.Artifact` objects

Artifacts created by the task, returned as a `padv.Artifact` object or array of `padv.Artifact` objects.

The `OutputArtifacts` property determines the output artifacts shown in the **I/O** column in the Process Advisor app.

The build system only manages output artifacts specified by the task result. For custom tasks, use the `OutputPaths` argument to define the output artifacts for the task result.

`Details` — Temporary storage for task-specific data
`struct`

Temporary storage for task-specific data, returned as a `struct`. The build system uses `Details` to store task-specific data that other build steps can use.

Note that `Details` are temporary. The build system does not save `Details` with the task results after the build finishes.

Data Types: `struct`

`ResultValues` — Number of passing, warning, and failing conditions
`struct` with `Pass: 0`, `Warn: 0`, `Fail: 0` (default) | `struct` with fields `Pass`, `Warn`, `Fail`

Number of passing, warning, and failing conditions, returned as a `struct` with fields:

- `Pass` — Number of passing conditions returned by task
- `Warn` — Number of warning conditions returned by task
- `Fail` — Number of failing conditions returned by task

The `ResultValues` property determines the detailed results shown in the **Details** column in the Process Advisor app.

For example, the task `padv.builtin.task.RunModelStandards` runs several Model Advisor checks and returns the number of passing, warning, and failing checks. If you run the task and one check passes, two checks generate a warning, and three checks fail, `ResultValue` returns:

```
ans = 

  struct with fields:

    Pass: 1
    Warn: 2
    Fail: 3
```

Data Types: `struct`

`OutputPaths` — Define `OutputArtifacts` for task result
string

This property is write-only.

`OutputArtifacts` for task result, specified as a string or string array.

The build system adds each path specified by `OutputArtifacts` to the `OutputArtifacts` argument as a `padv.Artifact` object with type `padv_output_file`.

Example: `taskResultObj.OutputPaths = string(fullfile(pwd,filename))`

Example: `taskResultObj.OutputPaths = [string(fullfile(pwd,filename1)), string(fullfile(pwd,filename2))]`

Data Types: `char` | `string`

Object Functions

- `applyStatus`

Examples

Create Task Result for Custom Task

Create a `padv.TaskResult` object for a custom task that has a failing task status, outputs a single `.json` file, and 1 passing condition, 2 warning conditions, and 3 failing conditions.

Open the Process Advisor example project.

```
processAdvisorExampleStart
```

The model `AHRS_Voter` opens with the Process Advisor pane to the left of the Simulink canvas.

In the Process Advisor pane, click the **Edit process model** button to open the `processmodel.m` file for the project.

Replace the contents of the `processmodel.m` file with this example process model code:

```
function processmodel(pm)
    % Defines the project's processmodel

    arguments
        pm padv.ProcessModel
    end

    addTask(pm,"ExampleTask",Action=@ExampleAction);

end

function taskResult = ExampleAction(~)

    % Create a task result object that stores the results
    taskResult = padv.TaskResult();

    % Specify the task status shown in the Tasks column
    taskResult.Status = padv.TaskStatus.Fail;

    % Specify the output files shown in the I/O column
    cp = currentProject;
    rf = cp.RootFolder;
    outputFile = fullfile(rf,"tools","sampleChecks.json");
    taskResult.OutputPaths = string(outputFile);

    % Specify the values shown in the Details column
    taskResult.ResultValues.Pass = 1;
    taskResult.ResultValues.Warn = 2;
    taskResult.ResultValues.Fail = 3;

end
```

Save the `processmodel.m` file.

Go back to the Process Advisor app and click **Refresh Tasks** to update the list of tasks shown in the app.

In the top-left corner of the Process Advisor pane, switch the filter from **Model** to **Project**.

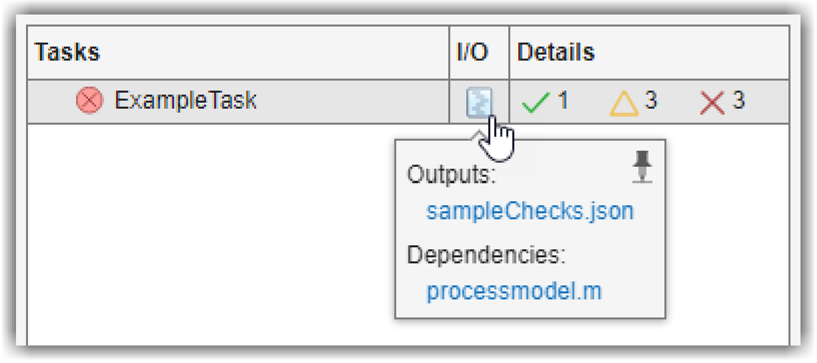
In the top-right corner of the Process Advisor pane, click **Run All**.

- The **Tasks** column shows a failing task status to the left of **ExampleTask**. This code from the example process model specifies the task status shown in the **Tasks** column:

  ```
  taskResult.Status = padv.TaskStatus.Fail;
  ```
- The **I/O** column shows an output artifact associated with the task. This code from the example process model specifies the output artifact shown in the **I/O** column:

  ```
  taskResult.OutputPaths = string(fullfile(pwd,outputFile));
  ```
- The **Details** column shows 1 passing condition, 2 warning conditions, and 3 failing conditions. This code from the example process model specifies the detailed task results shown in the **Details** column:

  ```
  taskResult.ResultValues.Pass = 1;
  taskResult.ResultValues.Warn = 2;
  taskResult.ResultValues.Fail = 3;
  ```



applyStatus

Namespace: padv

Apply new task status if priority is higher

Syntax

`applyStatus(resultObj,taskStatus)`

Description

`applyStatus(resultObj,taskStatus)` applies a new task status `taskStatus` to the task result object `resultObj` if the priority level of `taskStatus` is higher than the current `Status` property of the task result object.

The priority levels from lowest to highest are:

- `padv.TaskStatus.Pass`
- `padv.TaskStatus.Fail`
- `padv.TaskStatus.Error`

Note The function `applyStatus` can only change the `Status` to a higher priority status. For example, if you apply a failing status and then apply a passing status, the status remains a failing status because the priority of `padv.TaskStatus.Fail` is higher than the priority of `padv.TaskStatus.Pass`.

```
taskResult = padv.TaskResult(); % By default, Status is Pass.
applyStatus(taskResult, padv.TaskStatus.Fail); % Status changes to Fail.
applyStatus(taskResult, padv.TaskStatus.Pass); % Status remains Fail.
taskResult
```

```
taskResult =

  TaskResult with properties:

             Status: Fail
    OutputArtifacts: [0×0 padv.Artifact]
            Details: [1×1 struct]
       ResultValues: [1×1 struct]
```

To set the `Status` property of a task result object to a specific value, manually set the property to either `padv.TaskStatus.Pass`, `padv.TaskStatus.Fail`, or `padv.TaskStatus.Error`. For example, to set the `Status` of a task result object `taskResult` to `Pass`, use `taskResult.Status = padv.TaskStatus.Pass`.

Examples

Apply Status to Task Result

Use `applyStatus` to update the `Status` property of a task result object. If the status is a higher priority status, `applyStatus` updates the `Status` property of the task result object.

Create a task result object. By default, the `Status` property of the task result object is specified as `Pass`.

```
taskResult = padv.TaskResult();
```

Suppose the task needs to generate an error. Use `applyStatus` to apply an error task status, specified by `padv.TaskStatus.Error`.

```
applyStatus(taskResult,padv.TaskStatus.Error);
```

`padv.TaskStatus.Error` has a higher priority than a passing task status, so `applyStatus` updates the `Status` property of the task result object.

Apply a passing task status to the task result object. A passing task status is specified by `padv.TaskStatus.Pass`.

```
applyStatus(taskResult,padv.TaskStatus.Pass);
```

`padv.TaskStatus.Pass` does not have a higher priority than an error task status, so `applyStatus` does not change the `Status` of the task result object.

Inspect the properties of the task result object.

```
taskResult
```

Suppose you want to reset the status of the task result object to a passing task status. Manually specify the `Status` property as `padv.TaskStatus.Pass`.

```
taskResult.Status = padv.TaskStatus.Pass
```

```
taskResult = 

  TaskResult with properties:

              Status: Pass
     OutputArtifacts: [0×0 padv.Artifact]
             Details: [1×1 struct]
        ResultValues: [1×1 struct]
```

The task result object now has a passing task status.

Input Arguments

`resultObj` — Task result object
`padv.TaskResult` object

Task result object, specified as a `padv.TaskResult` object.

`taskStatus` — Task status
`padv.TaskStatus.Pass` | `padv.TaskStatus.Fail` | `padv.TaskStatus.Error`

Task status, specified as `padv.TaskStatus.Pass`, `padv.TaskStatus.Fail`, or `padv.TaskStatus.Error`.

Example: `padv.TaskStatus.Fail`

Build System API

The support package provides a build system that you can use to orchestrate and automate the steps in your model-based design (MBD) pipeline. The build system is software that can orchestrate tasks, efficiently execute tasks in the pipeline, and perform other actions related to the pipeline. You can call the build system either through the Process Advisor app or by using the `runprocess` function. When you call the build system, the build system loads the process model, analyzes the project, and orchestrates the create of a pipeline of tasks.

For examples of how to use the build system, see the "Control Builds" and "Integrate into CI" chapters in the user's guide.

Classes

Class	Description
`padv.BuildResult`	Result from build system build
`padv.Preferences`	(To be removed) Set `runprocess` function settings
`padv.ProjectSettings`	Build system settings for project
`padv.UserSettings`	Build system settings for user

Functions

Run Tasks

Function	Description
`runprocess`	Run task iterations defined by the process model

Get Task Iterations and Tasks Results

Function	Description
`createProcessTaskID`	Generate an ID for a specific task iteration defined by the process model
`generateProcessTasks`	Generate a list of the IDs for the task iterations defined by the process model
`getProcessTaskResults`	Get available results and result details for task iterations defined by the process model

runprocess

Generate and run pipeline of tasks by using build system

Syntax

```
[buildResult,exitCode] = runprocess()
[buildResult,exitCode] = runprocess(Name=Value)
```

Description

`[buildResult,exitCode] = runprocess()` generate a model-based design (MBD) pipeline and run the pipeline using the build system. The process model (`processmodel.p` or `processmodel.m`) defines the tasks for the pipeline.

This function requires CI/CD Automation for Simulink Check.

`[buildResult,exitCode] = runprocess(Name=Value)` specifies how the MBD pipeline runs using one or more `Name=Value` arguments.

Examples

Run MBD Pipeline

Open a project and use `runprocess` to generate and run the MBD pipeline using the build system.

Open the **Process Advisor** example project, which contains an example process model. The process model defines the tasks for the pipeline.

```
processAdvisorExampleStart
```

Generate and run the MBD pipeline and store the results in the variable `results`.

```
results = runprocess()
```

Run Specific Tasks

Open a project and use `runprocess`. To only run a specific set of tasks, provide the task names to the `Tasks` argument.

Open the Process Advisor example project, which contains an example process model. The process model defines the tasks for the pipeline.

```
processAdvisorExampleStart
```

Run only the tasks **Generate Simulink Web View** (`padv.builtin.task.GenerateSimulinkWebView`) and **Check Modeling Standards** (`padv.builtin.task.RunModelStandards`) by specifying the `Tasks` argument.

```
% run the Generate Simulink Web View task
% and the Check Modeling Standards tasks
runprocess(...
Tasks = ["padv.builtin.task.GenerateSimulinkWebView",...
"padv.builtin.task.RunModelStandards"])
```

Run Tasks Associated with Specific Artifact

Open a project and use `runprocess`. To only run the tasks associated with a specific artifact, provide a full path, relative path, or a `padv.Artifact` object to the `FilterArtifact` argument.

Open the Process Advisor example project, which contains an example process model. The process model defines the tasks for the pipeline.

```
processAdvisorExampleStart
```

Run tasks for the `AHRS_Voter` model by specifying the relative path to the model.

```
% run only the AHRS_Voter tasks
runprocess(...
FilterArtifact = fullfile(...
"02_Models","AHRS_Voter","specification","AHRS_Voter.slx"))
```

Run Specific Task Iteration, Clean Task Results, and Delete Task Outputs

Open a project and run one specific task iteration in the pipeline.

Open the Process Advisor example project, which contains an example process model.

```
processAdvisorExampleStart
```

Get a list of the task iterations in the MBD pipeline.

```
tasks = generateProcessTasks;
```

Force `runprocess` to run one of the task iterations by specifying `Force` as `true` and `Tasks` as one of the tasks in `tasks`.

```
runprocess(Force=true,Tasks=tasks(1))
```

When `Force` is `true`, `runprocess` runs the pipeline, even if the pipeline already had results that were marked as up to date.

Clean task results and delete task outputs.

```
runprocess(Clean=true,DeleteOutputs=true)
```

When you clean task results and delete task outputs, it is as if the tasks were not run.

Dry-Run Process with License Checkouts

Before you try to run your process in CI, you can dry-run your process to validate your task inputs, generate representative task outputs, and make sure that you have the required licenses available on your CI agent.

Open the Process Advisor example project, which contains an example process model.

```
processAdvisorExampleStart
```

Perform a dry-run of the process and automatically check out the licenses associated with the tasks by using the `DryRun` and `DryRunLicenseCheckout` arguments.

```
runprocess(DryRun = true, DryRunLicenseCheckout = true)
```

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `[buildResult,exitCode] = runprocess(Force=true)`

`Tasks` — Names of tasks that you want to run
character vector | cell array of character vectors | string | string array

Names of tasks that you want to run, specified as a character vector, cell array of character vectors, string, or string array. The task name is defined by the `Name` property of the task.

Alternatively, you can specify the task iteration IDs for individual task iterations that you want to run. See `generateProcessTasks` and `createProcessTaskID`.

Note You can only run tasks that are defined in the process model.

Example: `"padv.builtin.task.GenerateSimulinkWebView"`

Example: `["padv.builtin.task.GenerateSimulinkWebView",... "padv.builtin.task.RunModelStandards"]`

Data Types: `char` | `string`

`Process` — Name of process that you want to run
`padv.ProcessModel.DefaultProcessId` (default) | character vector | string

Name of process that you want to run, specified by a character vector or string.

Example: `"CIPipeline"`

Data Types: `char` | `string`

`Subprocesses` — Names of subprocesses that you want to run
character vector | cell array of character vectors | string | string array

Names of subprocesses that you want to run, specified as a character vector, cell array of character vectors, string, or string array. The subprocess name is defined by the `Name` property of the subprocess.

Example: `"SubprocessA"`

Example: `["SubprocessA",SubprocessB"]`

Data Types: `char` | `string`

`FilterArtifact` — Artifacts that you want to run tasks for
`string.empty` (default) | string | `padv.Artifact` object | array of `padv.Artifact` objects

Artifact or artifacts that you want to run tasks for, specified as either the full path to an artifact, relative path to an artifact, a `padv.Artifact` object that represents an artifact, or an array of `padv.Artifact` objects.

Example: `fullfile("C:\","User","projectA","myModel.slx")`

Example: `fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx")`

Example:
`padv.Artifact("sl_model_file",fullfile("02_Models","AHRS_Voter","specificatio n","AHRS_Voter.slx"))`

Data Types: `string`

`Force` — Skip or run up-to-date task iterations
`false` or `0` (default) | `true` or `1`

Skip or run up-to-date tasks, specified as a numeric or logical `0` (`false`) or `1` (`true`). By default, `runprocess` does not run task iterations that have up to date results.

Example: `true`

Data Types: `logical`

`Isolation` — Include task dependencies
`false` or `0` (default) | `true` or `1`

Include task dependencies, specified as a numeric or logical `0` (`false`) or `1` (`true`).

By default, `runprocess` includes task dependencies when running a task. Specify `Isolation` as `true` if you want to run a task in isolation, without running task dependencies.

Note that you define task dependencies in the process model by using the function `dependsOn`.

Example: `true`

Data Types: `logical`

`Clean` — Clear task results and delete outputs
`false` or `0` (default) | `true` or `1`

Clear task results and delete task outputs, specified as a numeric or logical `0` (`false`) or `1` (`true`).

If you specify `Clean` as `true`:

- The `runprocess` functions ignores other name-value arguments, cleans the task results, and deletes task outputs.

- The `OutputDirectory` of the task might still contain files. The `runprocess` function only deletes the task outputs, specified by the `OutputPaths` property of the `padv.TaskResult` object for the task.
- You cannot specify `MarkStale` as `true`. The arguments are mutually exclusive.

Example: `true`

Data Types: `logical`

`DeleteOutputs` — Delete task outputs
`false` or `0` (default) | `true` or `1`

Delete task outputs, specified as a numeric or logical `0` (`false`) or `1` (`true`).

Note To delete task outputs with `DeleteOutputs`, you must specify `Clean` as `true`.

Example: `true`

Data Types: `logical`

`MarkStale` — Mark task as outdated
`false` or `0` (default) | `true` or `1`

Mark task as outdated, specified as a numeric or logical `0` (`false`) or `1` (`true`). When you mark a task as stale, the results appear outdated in the Process Advisor app.

Note If you specify `MarkStale` as `true`, then you cannot specify `Clean` as `true`. The arguments are mutually exclusive.

Example: `true`

Data Types: `logical`

`DryRun` — Validate inputs and generate representative outputs without running task
`false` or `0` (default) | `true` or `1`

Validate task inputs and generate representative task outputs without actually running the tasks, specified as a numeric or logical `0` (`false`) or `1` (`true`).

You can use a dry-run to help make sure your tasks are set up as expected.

If you want to override the dry-run functionality for a task, you can:

- Override the `dryRun` method for class-based tasks
- Specify the task property `DryRunAction` for function-based tasks
- Change the default dry-run results for each task in your process model by modifying the `DefaultDryRunResults` property for `padv.ProcessModel`

By default, if a task does not have a dry-run functionality defined, the task returns the default dry-run results specified by the `padv.ProcessModel` property `DefaultDryRunResults`.

To have the dry-run check out the licenses associated with the task, specify the `runprocess` argument `DryRunLicenseCheckout` as `true`.

Example: `true`

Data Types: `logical`

`DryRunLicenseCheckout` — Dry-runs check out product licenses associated with tasks in process
`false` or `0` (default) | `true` or `1`

Dry-runs check out the product licenses associated with the tasks in process, returned as a numeric or logical `1` (`true`) or `0` (`false`).

To perform a dry-run, you can specify the `runprocess` argument `DryRun` as `true`.

Example: `true`

Data Types: `logical`

`ExitInBatchMode` — Exit MATLAB when running in batch mode
`true` or `1` (default) | `false` or `0`

Exit MATLAB when running in batch mode, specified as a numeric or logical `1` (`true`) or `0` (`false`). By default, if you are running MATLAB in batch mode and `runprocess` finishes running, `runprocess` exits MATLAB.

The process exit codes are:

- `0` if the `Status` of `buildResult` is `PASS`
- `1` if the `Status` of `buildResult` is `ERROR`
- `2` if the `Status` of `buildResult` is `FAIL`

Example: `false`

Data Types: `logical`

`GenerateReport` — Automatically generate report at end of `runprocess`
`false` or `0` (default) | `true` or `1`

Automatically generate report after `runprocess` runs tasks, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `runprocess(GenerateReport = true)`

Data Types: `logical`

`ReportFormat` — File format for generated report
`"pdf"` (default) | `"html"` | `"html-file"` | `"docx"`

File format for the generated report, specified as one of these values:

- `"pdf"` — PDF file
- `"html"` — HTML report, packaged as a zipped file that contains the HTML file, images, style sheet, and JavaScript® files of the report
- `"html-file"` — HTML report

- `"docx"` — Microsoft® Word document

Note that for the `runprocess` function to generate a report, you must also specify the argument `GenerateReport` as `true`.

Example: `runprocess(GenerateReport = true,ReportFormat = "html-file")`

`ReportPath` — Name and path of generated report
`"ProcessAdvisorReport"` (default) | string array

Name and path of generated report, specified as a string array.

Note that for the `runprocess` function to generate a report, you must also specify the argument `GenerateReport` as `true`.

Example: `runprocess(GenerateReport = true,ReportPath = fullfile(pwd,"folderName","reportName"))`

Data Types: `string`

`RerunFailedTasks` — Rerun failed task iterations
`false` or `0` (default) | `true` or `1`

Rerun failed task iterations, specified as a numeric or logical `0` (`false`) or `1` (`true`).

Example: `true`

Data Types: `logical`

`RerunErroredTasks` — Rerun errored task iterations
`false` or `0` (default) | `true` or `1`

Rerun errored task iterations, specified as a numeric or logical `0` (`false`) or `1` (`true`).

Example: `true`

Data Types: `logical`

`RefreshProcessModel` — Automatically refresh before running tasks
`true` or `1` (default) | `false` or `0`

Automatically refresh before running tasks, specified as a numeric or logical `1` (`true`) or `0` (`false`). By default, `runprocess` refreshes before running tasks so that the run uses the current state of the process model and project. If you specify `RefreshProcessModel` as `false`, `runprocess` does not refresh before running, but the run might not include the latest changes to tasks in the process model or artifacts in the project.

Example: `false`

Data Types: `logical`

`ReanalyzeProjectAnalysisIssues` — Automatically reanalyze project analysis issues that have severity level of error
`true` or `1` (default) | `false` or `0`

Automatically reanalyze project analysis issues that have a severity level of error, specified as a numeric or logical `1` (`true`) or `0` (`false`).

If you are using R2022b Update 1 or later, you can specify `ReanalyzeProjectAnalysisIssues` as `false` to prevent the build system from reanalyzing project analysis issues that have a severity level of error. This might reduce the execution time for `runprocess`, but the build system might not generate the expected task iterations or detect outdated results.

Fix the issues listed in the **Project Analysis Issues** pane of the Process Advisor app to make sure the build system can fully analyze the project, generate the expected task iterations, and detect outdated results.

Example: `false`

Data Types: `logical`

`GenerateJUnitForProcess` — Generate JUnit-style XML report for process
`false` or `0` (default) | `true` or `1`

Generate JUnit-style XML report for each task in process, specified as a numeric or logical `0` (`false`) or `1` (`true`).

Example: `true`

Data Types: `logical`

`EnableTaskLogging` — Control command-line outputs from tasks
`true` or `1` (default) | `false` or `0`

Control command-line outputs from tasks, specified as:

- A numeric or logical `0` (`false`) — Task logging is disabled.
- A numeric or logical `1` (`true`) — Task logging is enabled.

If the project setting `SuppressOutputWhenInteractive` is `true` and MATLAB is not running in batch mode, task logging is automatically disabled.

When task logging is disabled, tasks does not output information in the MATLAB Command Window.

Example: `false`

Data Types: `logical`

`SuppressOutputWhenInteractive` — Suppress command-line output from Process Advisor
`logical.empty` (default) | `1` or `true` | `0` or `false`

Suppress command-line output from Process Advisor during interactive MATLAB sessions, specified as either:

- An empty logical array (`logical.empty`) — No impact. `runprocess` follows the Process Advisor setting **Suppress outputs to command window**.
- A numeric or logical `1` (`true`) — Override the Process Advisor setting **Suppress outputs to command window** and suppress output to the MATLAB Command Window.
- A numeric or logical `0` (`false`) — Override the Process Advisor setting **Suppress outputs to command window** and show build logs and task execution messages in the MATLAB Command Window.

Note that this argument has no impact when you run MATLAB in batch mode, which is typically the case for CI systems.

Example: `true`

Data Types: `logical`

Output Arguments

buildResult — Results of run
padv.BuildResult

Results of run, returned as a padv.BuildResult object.

The padv.BuildResult object includes:

- The start time and end time of the run
- The status of the run (Pass,Error,Fail)
- Lists of the tasks that the passed, generated errors, were skipped, or failed during the run
- Input arguments to the run

exitCode — Exit code from run
0 | 1 | 2

Exit code from run, returned as a double representing the process error code.

- 0 if the Status of buildResult is Pass
- 1 if the Status of buildResult is Error
- 2 if the Status of buildResult is Fail

Alternative Functionality

App

You can also use the Process Advisor app to run each task or individual task iterations in the process. To open the Process Advisor app for a project, in the MATLAB Command Window, enter:

```
processAdvisorWindow
```

createProcessTaskID

Generate ID for specific task iteration defined by process model

Syntax

```
ID = createProcessTaskID(task,artifact)
```

Description

`ID = createProcessTaskID(task,artifact)` generates the identifier, `ID`, for an individual task iteration defined by the process model. A *task iteration* is the pairing of a task, `task`, to a specific project artifact, `artifact`.

Examples

Run One Task on One Artifact

Suppose you have a process model with several tasks, but right now you only want to run the task `padv.builtin.task.RunModelStandards` on the model `AHRS_Voter.slx`. Use the function `createProcessTaskID` to generate the ID for a specific task iteration, then use the function `runprocess` to run only that specific task iteration.

Open the **Process Advisor** example project, which contains an example process model.

```
processAdvisorExampleStart
```

Specify a task that exists in the process model. For this example, specify the built-in task for running Model Advisor checks, `padv.builtin.task.RunModelStandards`.

```
task = padv.builtin.task.RunModelStandards;
```

Use `padv.Artifact` to specify the project artifact that you want the task to run on. For this example, the artifact type is `sl_model_file` because the artifact is a Simulink model and the address is the path to `AHRS_Voter.slx`, relative to the project root.

```
artifactType = "sl_model_file";
address = fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx");
artifact = padv.Artifact(artifactType,address);
```

Use the task instance and artifact to generate the ID for the specific task iteration.

```
runModelStandards_for_AHRS_Voter = createProcessTaskID(task,artifact)
```

```
runModelStandards_for_AHRS_Voter = 

"padv.builtin.task.RunModelStandards|sl_model_file|02_Models/AHRS_Voter/specification/AHRS_Voter
```

Use the function `runprocess` to run the task iteration.

```
runprocess(Tasks = runModelStandards_for_AHRS_Voter)
```

When you specify the `Tasks` value as the ID for a single task iteration, the function `runprocess` runs only the specified task iteration. For this example, `runprocess` runs only the task iteration associated with the task `padv.builtin.task.RunModelStandards` and the artifact `AHRS_Voter.slx`.

Note Alternatively, instead of creating and then running the task iterations, you can directly specify the `Task` and `FilterArtifact` arguments of the `runprocess` function to run the task on a specific artifact:

```
runprocess(...
Tasks = "padv.builtin.task.RunModelStandards",...
FilterArtifact = fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx"))
```

But note that you can only run the tasks if the tasks are defined in the process model and the artifacts exist in the project.

Input Arguments

`task` — Task name or subclass of `padv.Task`

string | character vector | `padv.Task` object

Either:

- Name of task, specified as a string or character vector. The name of a task is stored in the `Name` property of the task. For example, `"name_of_my_custom_task"`.
- Subclass of `padv.Task`, specified as a `padv.Task` object. Built-in tasks are subclasses of `padv.Task`. For example, you can specify the `padv.Task` object `padv.builtin.task.RunModelStandards` for the `task` argument.

Example: `"name_of_my_custom_task"`

Example: `"padv.builtin.task.RunModelStandards"`

Example: `padv.builtin.task.RunModelStandards`

Data Types: `char` | `string`

`artifact` — File in project

`padv.Artifact` object

File in project, specified as a `padv.Artifact` object.

Example: `padv.Artifact("project","ProcessAdvisorExample.prj")`

Example: `padv.Artifact("sl_model_file", "02_Models/AHRS_Voter/specification/AHRS_Voter.slx")`

Output Arguments

`ID` — Identifier for task iteration defined by process model

string

Identifier for task iteration defined by the process model, returned as a string.

IDs take the form: "*`taskNameOrObject|fileType|relativePath`*", where `relativePath` is the path relative to the project root.

Example IDs:

- `"myCustomProjectTask|project|ProcessAdvisorExample.prj"`
- `"padv.builtin.task.RunModelStandards|sl_model_file|02_Models/AHRS_Voter/specification/AHRS_Voter.slx"`
- `"padv.builtin.task.RunTestsPerTestCase|sl_test_case|ced877ff-cfb8-4fa8-9bbf-aaa29b1d926b"`

Alternative Functionality

App

You can also use the Process Advisor app to run individual task iterations in the process. To open the Process Advisor app for a project, in the MATLAB Command Window, enter:

```
processAdvisorWindow
```

generateProcessTasks

Get list of IDs for task iterations in MBD pipeline

Syntax

```
IDs = generateProcessTasks()
IDs = generateProcessTasks(Name=Value)
```

Description

`IDs = generateProcessTasks()` returns identifiers, `IDs`, for each of the task iterations in the model-based design (MBD) pipeline.

By default, `generateProcessTasks` returns an ID for each combination of tasks and associated project artifacts in the MBD pipeline.

`IDs = generateProcessTasks(Name=Value)` filters the list of IDs using one or more `Name=Value` arguments.

Examples

List IDs for Each Task Iteration in MBD Pipeline

Suppose you have a process model that adds several tasks to the process. Use the function `generateProcessTasks` to list the IDs for each task iteration in the MBD pipeline.

Open the Process Advisor example project, which contains an example process model.

```
processAdvisorExampleStart
```

List the IDs for each task iteration in the MBD pipeline.

```
IDs = generateProcessTasks()
```

Run Each Task Associated with an Artifact

Suppose you have a process model that adds several tasks to the process, but right now you only want to run the tasks associated with one specific artifact. You can use the function `generateProcessTasks`, but filter the list of IDs to only include task iterations associated with a specific model in the project, `AHRS_Voter.slx`.

Open the **Process Advisor** example project, which contains an example process model.

```
processAdvisorExampleStart
```

Use `padv.Artifact` to specify the project artifact that you want the task to run on. For this example, the artifact type is `sl_model_file` because the artifact is a Simulink model and the address is the path to `AHRS_Voter.slx`, relative to the project root.

```
artifactType = "sl_model_file";
address = fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx");
artifact = padv.Artifact(artifactType,address);
```

Get a list of the IDs for the task iterations in the MBD pipeline, but filter the list to include only task iterations associated with the artifact `AHRS_Voter.slx`.

```
IDs_AHRS_Voter = generateProcessTasks(FilterArtifact=artifact);
```

Use the function `runprocess` to run only the task iterations associated with the artifact `AHRS_Voter.slx`.

```
runprocess(Tasks=IDs_AHRS_Voter)
```

When you specify the `Tasks` value as a list of IDs for task iterations, the function `runprocess` runs only the specified task iterations. For this example, `runprocess` runs only the task iterations associated with the artifact `AHRS_Voter.slx`.

Note Alternatively, instead of generating and then running the task iterations, you can directly specify the `FilterArtifact` argument of the `runprocess` function to run the tasks associated with the artifact:

```
runprocess(FilterArtifact = fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx"))
```

But note that you can only run the tasks if the tasks are defined in the process model and the artifacts exist in the project.

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `generateProcessTasks(Tasks = "padv.builtin.task.GenerateSimulinkWebView")`

`FilterArtifact` — Artifacts that you want to run tasks for
`string.empty` (default) | string | `padv.Artifact` object | array of `padv.Artifact` objects

Artifact or artifacts that you want to generate IDs for, specified as either the full path to an artifact, relative path to an artifact, a `padv.Artifact` object that represents an artifact, or an array of `padv.Artifact` objects.

Example: `fullfile("C:\","User","projectA","myModel.slx")`

Example: `fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx")`

Example: `padv.Artifact("sl_model_file",fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx"))`

Data Types: `string`

`Process` — Name of process that you want to generate IDs for
`padv.ProcessModel.DefaultProcessId` (default) | character vector | string

Name of process that you want to generate IDs for, specified by a character vector or string.

Example: `"CIPipeline"`

Data Types: `char` | `string`

`Subprocesses` — Names of subprocesses that you want to generate IDs for
character vector | cell array of character vectors | string | string array

Names of subprocesses that you want to generate IDs for, specified as a character vector, cell array of character vectors, string, or string array. The subprocess name is defined by the `Name` property of the subprocess.

Example: `"SubprocessA"`

Example: `["SubprocessA",SubprocessB"]`

Data Types: `char` | `string`

`Tasks` — Names of tasks that you want to generate IDs for
character vector | cell array of character vectors | string | string array

Names of tasks that you want to generate IDs for, specified as a character vector, cell array of character vectors, string, or string array. The task name is defined by the `Name` property of the task.

Example: `"padv.builtin.task.GenerateSimulinkWebView"`

Example: `["padv.builtin.task.GenerateSimulinkWebView",... "padv.builtin.task.RunModelStandards"]`

Data Types: `char` | `string`

Output Arguments

`IDs` — Identifiers for task iterations defined by process model
string

Identifiers for task iterations in the MBD pipeline, returned as a string.

IDs take the form: "*`taskNameOrObject|fileType|relativePath`*", where `relativePath` is the path relative to the project root.

Example IDs:

- `"myCustomProjectTask|project|ProcessAdvisorExample.prj"`
- `"padv.builtin.task.RunModelStandards|sl_model_file|02_Models/AHRS_Voter/specification/AHRS_Voter.slx"`
- `"padv.builtin.task.RunTestsPerTestCase|sl_test_case|ced877ff-cfb8-4fa8-9bbf-aaa29b1d926b"`

Alternative Functionality

App

You can also use the Process Advisor app to run individual task iterations in the process or to view task iterations for a specific model.

- To open the Process Advisor app for a project, in the MATLAB Command Window, enter:

  ```
  processAdvisorWindow
  ```
- To open the Process Advisor app for a specific model, provide the name of the model, `modelName`, to the function `processadvisor`:

  ```
  processadvisor(modelName)
  ```

getProcessTaskResults

Get available task results and result details for task iterations in MBD pipeline

Syntax

```
[IDsWithTaskResults,taskResults,taskResultsOutdated] =
getProcessTaskResults()
[IDsWithTaskResults,taskResults,taskResultsOutdated] = getProcessTaskResults(
Name=Value)
```

Description

`[IDsWithTaskResults,taskResults,taskResultsOutdated] = getProcessTaskResults()` returns available task results and result details for the task iterations in the MBD pipeline. The function returns the identifiers for task iterations that have task results, `IDsWithTaskResults`, the current task results, `taskResults`, and a logical value that indicates if the task results are outdated, `taskResultsOutdated`.

If you do not have task results, use the function `runprocess` to run tasks and generate results. The function `getProcessTaskResults` only returns information related to task iterations that are defined in the process model. If you have task results from a task iteration that is not in the process model, the function does not return information related to those task results.

`[IDsWithTaskResults,taskResults,taskResultsOutdated] = getProcessTaskResults(Name=Value)` specifies options using one or more name-value arguments.

Examples

Get Output Artifacts from Task Results

Get the available task results for a task iteration and use the result details to find information about the output artifacts of the task iteration.

Open the Process Advisor example project, which contains an example process model.

```
processAdvisorExampleStart
```

List the IDs for each task iteration in the MBD pipeline.

```
IDs = generateProcessTasks();
```

Run the first task iteration in the list.

```
runprocess(Tasks=IDs(1))
```

For this example, the build system runs the task `padv.builtin.task.GenerateSimulinkWebView` for the model `AHRS_Voter.slx`.

Get the available task results and result details.

```
[IDsWithResults,results,outdated] = getProcessTaskResults()

IDsWithResults =

    "padv.builtin.task.GenerateSimulinkWebView|sl_model_file|02_Models/AHRS_Voter/specification/


results =

  TaskResult with properties:

             Status: Pass
    OutputArtifacts: [1×1 padv.Artifact]
            Details: [1×1 struct]
       ResultValues: [1×1 struct]


outdated =

  logical

   0
```

Get the output artifacts from the result. For this example, the result is a Simulink Web View for the model `AHRS_Voter.slx`.

```
webView = results.OutputArtifacts

webView =

  Artifact with properties:

               Type: "padv_output_file"
             Parent: [0×0 padv.Artifact]
    ArtifactAddress: [1×1 padv.util.ArtifactAddress]
              Alias: ""
```

Get Output Artifacts from Task Results for Specific Model

Get the available task results for a specific model.

Open the Process Advisor example project, which contains an example process model.

```
processAdvisorExampleStart
```

Check modeling standards for the model `AHRS_Voter.slx` by using the built-in task `padv.builtin.task.RunModelStandards`. The task uses Model Advisor to run checks on the model.

```
runprocess(...
Tasks = "padv.builtin.task.RunModelStandards",...
FilterArtifact = fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx"));
```

Get the task results and result details.

```
[IDsWithResults,results,outdated] = getProcessTaskResults(...
Tasks = "padv.builtin.task.RunModelStandards",...
FilterArtifact = fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx"))
```

```
IDsWithResults = 

    "padv.builtin.task.RunModelStandards|sl_model_file|ProcessAdvisorExample|02_Models/AHRS_Vote


results = 

  TaskResult with properties:

              Status: Pass
     OutputArtifacts: [1×1 padv.Artifact]
             Details: [1×1 struct]
        ResultValues: [1×1 struct]


outdated = 

  logical

   0
```

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `[~,results,~] = getProcessTaskResults(Tasks="maTask", FilterArtifact=fullfile("models","myModel.slx"));`

Tasks — Names of tasks that you want to run
character vector | cell array of character vectors | string | string array

Names of tasks that you want to run, specified as a character vector, cell array of character vectors, string, or string array. The task name is defined by the `Name` property of the task.

Alternatively, you can specify the task iteration IDs for individual task iterations that you want to run. See `generateProcessTasks` and `createProcessTaskID`.

Note You can only run tasks that are defined in the process model.

Example: `"padv.builtin.task.GenerateSimulinkWebView"`

Example: `["padv.builtin.task.GenerateSimulinkWebView",... "padv.builtin.task.RunModelStandards"]`

Data Types: `char` | `string`

Process — Name of process that you want to run
`padv.ProcessModel.DefaultProcessId` (default) | character vector | string

Name of process that you want to run, specified by a character vector or string.

Example: `"CIPipeline"`

Data Types: `char` | `string`

`Subprocesses` — Names of subprocesses that you want to run
character vector | cell array of character vectors | string | string array

Names of subprocesses that you want to run, specified as a character vector, cell array of character vectors, string, or string array. The subprocess name is defined by the `Name` property of the subprocess.

Example: `"SubprocessA"`

Example: `["SubprocessA",SubprocessB"]`

Data Types: `char` | `string`

`FilterArtifact` — Artifacts that you want to run tasks for
`string.empty` (default) | string | `padv.Artifact` object | array of `padv.Artifact` objects

Artifact or artifacts that you want to run tasks for, specified as either the full path to an artifact, relative path to an artifact, a `padv.Artifact` object that represents an artifact, or an array of `padv.Artifact` objects.

Example: `fullfile("C:\","User","projectA","myModel.slx")`

Example: `fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx")`

Example:
`padv.Artifact("sl_model_file",fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx"))`

Data Types: `string`

Output Arguments

`IDsWithTaskResults` — Identifiers for task iterations that have task results and are defined in process model
string | string array

Identifiers for task iterations that have task results and are defined in the process model, returned as a string or string array.

- If you do not have task results for task iterations in your process model, `IDsWithTaskResults` returns an empty array, `[]`. You can use the function `runprocess` to run tasks and generate results.
- If you have task results for task iterations that are not in your process model, `IDsWithTaskResults` returns an empty array, `[]`.
- If you have task results for task iterations that are in your process model, `IDsWithTaskResults` returns the IDs for the task iterations that have task results.

IDs take the form: "*`taskNameOrObject|fileType|relativePath`*", where `relativePath` is the path relative to the project root.

Example IDs:

- `"myCustomProjectTask|project|ProcessAdvisorExample.prj"`
- `"padv.builtin.task.RunModelStandards|sl_model_file|02_Models/AHRS_Voter/specification/AHRS_Voter.slx"`
- `"padv.builtin.task.RunTestsPerTestCase|sl_test_case|ced877ff-cfb8-4fa8-9bbf-aaa29b1d926b"`

`taskResults` — Results for task iterations
`padv.TaskResult` | `padv.TaskResult` array

Results for task iterations, returned as a `padv.TaskResult` or `padv.TaskResult` array.

- If you do not have task results for task iterations in your process model, `taskResults` returns an empty array, `[]`.
- If you have task results for task iterations that are not in your process model, `taskResults` returns an empty array, `[]`.
- If you have task results for task iterations that are in your process model, `taskResults` returns a `padv.TaskResult` or `padv.TaskResult` array.

`padv.TaskResult` objects contain properties for the result status, output artifacts, details, and result values for the number of passing, warning, and failing results for task iterations.

`taskResultsOutdated` — Whether task results are outdated or up-to-date
logical | logical array

Status of task results, returned as a logical value or logical array. Values of `1` indicate that the results for the task iteration are outdated and might not reflect the current state of the project or task. Values of `0` indicate that the results for the task iteration are up-to-date. The result is an empty array, `[]`, when there are not task results.

padv.BuildResult

Result from build system build

Description

Use the build result, `padv.BuildResult`, to find the properties of the build system build, including a list of the tasks that the build system ran and the settings the build system used.

Creation

Syntax

`buildResultObj = padv.BuildResult()`

Description

`buildResultObj = padv.BuildResult()` stores the results from a build system build.

Properties

`StartTime` — Start time of build
`datetime`

Start time of build, returned as `datetime`.

Example: `09-Aug-2022 14:32:05`

Data Types: `datetime`

`EndTime` — End time of build
`datetime`

End time of build, returned as `datetime`.

Example: `09-Aug-2022 14:32:37`

Data Types: `datetime`

`Status` — Overall status for build
`Pass` (default) | `Fail` | `Error`

Overall status for build, returned as the `padv.TaskStatus` enumeration value:

- `Error` if a task iteration in the build returns an error.
- `Fail` if none of the task iterations in the build return an error, but at least one task iteration fails.
- `Pass` if none of the task iterations were run, or if none of the task iterations in the build return an error or fail.

Example: `Pass`

`ResultValues` — Task iteration result values

`[1×1 struct]` (default)

Task iteration result values, returned as a structure array with fields:

- `Pass`
- `Warn`
- `Fail`

For example, if the build runs one task iteration and the task iteration returns one passing result and five warning results, the structure array contains:

```
  struct with fields:

    Pass: 1
    Warn: 5
    Fail: 0
```

Data Types: `struct`

`PassTasks` — IDs for task iterations that passed during the build

cell array

IDs for task iterations that passed during the build, returned as a cell array.

If the build system runs one task iteration and the task iteration passes, `PassTasks` returns a one-dimensional cell array. For example, if the build system only ran the task `padv.builtin.task.GenerateCode` on the model `AHRS_Voter.slx` and the task iteration passed, `PassTasks` returns:

```
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/AHRS_Voter/specification/AHRS_Voter.slx
```

If multiple task iterations pass, `PassTasks` returns one cell for each task iteration that passed. For example:

```
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/AHRS_Voter/specification/AHRS_Voter.slx
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/Actuator_Control/specification/Actuator_
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/Flight_Control/specification/Flight_Cont
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/InnerLoop_Control/specification/InnerLoo
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/OuterLoop_Control/specification/OuterLoo
```

Data Types: `cell`

`ErrorTasks` — IDs for task iterations that returned an error during the build

cell array

IDs for task iterations that returned an error during the build, returned as a cell array.

If the build system runs one task iteration and the task iteration returns an error, `ErrorTasks` returns a one-dimensional cell array. For example, if the build system tried to run a custom task, `customTask`, on the model `AHRS_Voter.slx`, but the task iteration returned an error, `ErrorTasks` returns:

```
{'customTask|sl_model_file|02_Models/AHRS_Voter/specification/AHRS_Voter.slx'}
```

If multiple task iterations error, `ErrorTasks` returns one cell for each task iteration that returned an error. For example:

```
{'customTask|sl_model_file|02_Models/AHRS_Voter/specification/AHRS_Voter.slx'              }
{'customTask|sl_model_file|02_Models/Actuator_Control/specification/Actuator_Control.slx'  }
{'customTask|sl_model_file|02_Models/Flight_Control/specification/Flight_Control.slx'      }
{'customTask|sl_model_file|02_Models/InnerLoop_Control/specification/InnerLoop_Control.slx'}
{'customTask|sl_model_file|02_Models/OuterLoop_Control/specification/OuterLoop_Control.slx'}
```

Data Types: `cell`

`SkippedTasks` — IDs for task iterations that the build system skipped
cell array

IDs for task iterations that the build system skipped, returned as a cell array. The build system skips task iterations that already have up-to-date results, unless you specify `Force` as `true` when you call the function `runprocess`.

If the build system skips one task iteration, `SkippedTasks` returns a one-dimensional cell array. For example, if you instructed the build system to run the task `padv.builtin.task.GenerateCode` on the model `AHRS_Voter.slx`, but the task iteration already had up-to-date results, `SkippedTasks` returns:

```
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/AHRS_Voter/specification/AHRS_Voter.slx
```

If the build system skips multiple task iterations, `SkippedTasks` returns one cell for each task iteration that the build system skipped. For example:

```
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/AHRS_Voter/specification/AHRS_Voter.slx
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/Actuator_Control/specification/Actuator_
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/Flight_Control/specification/Flight_Cont
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/InnerLoop_Control/specification/InnerLoo
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/OuterLoop_Control/specification/OuterLoo
```

Data Types: `cell`

`FailedTasks` — IDs for task iterations that failed during the build
cell array

IDs for task iterations that failed during the build, returned as a cell array.

If the build system runs only one task iteration and the task iteration fails, `FailedTasks` returns a one-dimensional cell array. For example, if the build system ran the task `padv.builtin.task.GenerateCode` on the model `AHRS_Voter.slx` and the task iteration failed, `FailedTasks` returns:

```
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/AHRS_Voter/specification/AHRS_Voter.slx
```

If multiple task iterations fail, `FailedTasks` returns one cell for each task iteration that failed. For example:

```
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/AHRS_Voter/specification/AHRS_Voter.slx
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/Actuator_Control/specification/Actuator_
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/Flight_Control/specification/Flight_Cont
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/InnerLoop_Control/specification/InnerLoo
{'padv.builtin.task.GenerateCode|sl_model_file|02_Models/OuterLoop_Control/specification/OuterLoo
```

Data Types: `cell`

`InputArgs` — Input arguments that defined how the build system ran the build
`[1×1 struct]` (default) | structure array

Input arguments that defined how the build system ran the build, returned as a structure array with fields:

- `TasksToBuild` — List of task iteration IDs that you want the build system to run
- `Isolation` — Setting to include or ignore task dependencies
- `Force` — Setting to skip or run up-to-date task iterations
- `RerunFailedTasks` — Setting to ignore or rerun failed task iterations
- `RerunErroredTasks` — Setting to ignore or rerun task iterations that returned an error

For example, the `InputArgs` for a build result could return:

```
  struct with fields:

         TasksToBuild: [1×5 string]
            Isolation: 0
                Force: 0
     RerunFailedTasks: 0
    RerunErroredTasks: 0
```

For more information, see `runprocess`.

Data Types: `struct`

Examples

Get List of Passed Task Iterations and Build Settings

Open a project, run a build, and use the build result, `padv.BuildResult`, to get a list of the passed task iterations and the settings that the build system used when running the build.

Open the Process Advisor example project, which contains an example process model.

```
processAdvisorExampleStart
```

Generate a list of the tasks defined by the process model.

```
tasks = generateProcessTasks;
```

Run the first five task iterations in `tasks` and specify `Force` as `true`.

```
buildResult = runprocess(Force=true,Tasks=tasks(1:5))
```

Use the build result, `buildResult`, to get a list of the task iterations that passed.

```
passed = buildResult.PassTasks'
```

```
passed =

  5×1 cell array

    {'padv.builtin.task.GenerateSimulinkWebView|sl_model_file|02_Models/AHRS_Voter/specification/
    {'padv.builtin.task.GenerateSimulinkWebView|sl_model_file|02_Models/Actuator_Control/specific
    {'padv.builtin.task.GenerateSimulinkWebView|sl_model_file|02_Models/Flight_Control/specificat
    {'padv.builtin.task.GenerateSimulinkWebView|sl_model_file|02_Models/InnerLoop_Control/specifi
    {'padv.builtin.task.GenerateSimulinkWebView|sl_model_file|02_Models/OuterLoop_Control/specifi
```

When you used the function `runprocess`, you specified `Force` as `true`. You can see that information in the `InputArgs` property of the build result, `buildResult`.

```
runprocessInputs = buildResult.InputArgs
```

```
runprocessInputs = 

  struct with fields:

         TasksToBuild: ["padv.builtin.task.GenerateSimulinkWebView|sl_model_file|02_Models/AHRS_V
            Isolation: 0
                Force: 1
     RerunFailedTasks: 0
    RerunErroredTasks: 0
```

The build result shows that the `Force` setting was `1` (`true`) when the build system ran.

padv.Preferences

(To be removed) Specify settings for build system

Description

There are several settings that you can use to customize the behavior of the build system. These behaviors impact how the Process Advisor app and `runprocess` function run tasks. For example, you can use settings to use incremental builds, enable model caching, and customize other behaviors. The build system saves these settings in `padv.Preferences`. You can use the preferences, `padv.Preferences`, to specify settings for the Process Advisor app and settings for how the `runprocess` function runs builds.

Note The `padv.Preferences` class will be removed in a future release. Use the new classes `padv.ProjectSettings` and `padv.UserSettings` instead. The new classes allow you to programmatically control the settings for incremental builds, build system logging, and other behaviors, without needing to create a project startup script to persist run-time settings.

For information, see the "Version History" on page 4-33 for `padv.Preferences`.

Creation

Syntax

Description

`P = padv.Preferences()` gets the handle to the global preferences object, `P`. There is only one set of preference properties.

The `padv.Preferences` class is a `handle` class.

Properties

Project Settings

These settings are stored in the project and are shared with everyone using the project.

`IncrementalBuild` — Automatically detect changes and mark task results as outdated
`1` (`true`) | `0` (`false`)

Automatically detect changes and mark task results as outdated, specified as a numeric or logical `1` (`true`) or `0` (`false`).

When `IncrementalBuild` is `true` and you make a change to an artifact in your project, the build system marks impacted task results as outdated.

This property is equivalent to the **Incremental build** setting in the Process Advisor Settings dialog box.

Example: `true`

Data Types: `logical`

`EnableModelCaching` — Allow build system to cache models during build
`0` (`false`) (default) | `1` (`true`)

Allow the build system to cache models during a build, specified as a numeric or logical `1` (`true`) or `0` (`false`).

If you specify the property `EnableModelCaching` as `true`, you allow the build system to cache models instead of reloading the same models multiple times within a build. For more information, see "Cache Models and Other Artifacts Used During Build".

This property is equivalent to the **Enable model caching** setting in the Process Advisor Settings dialog box.

Example: `true`

Data Types: `logical`

`MaxNumModelsInCache` — Maximum number of models in cache
`1` (default) | positive value

Maximum number of models in the model cache, specified as a positive value.

Example: `2`

`MaxNumTestResultsInCache` — Maximum number of test results in cache
`20` (default) | positive value

Maximum number of test results in the cache, specified as a positive value.

Example: `30`

`SuppressOutputWhenInteractive` — Suppress command-line output from Process Advisor
`0` (`false`) (default) | `1` (`true`)

Suppress command-line output from Process Advisor during interactive MATLAB sessions, specified as a numeric or logical `1` (`true`) or `0` (`false`).

You can use this setting to suppress command-line outputs from the build system, such as the build log and task execution messages from Process Advisor and the `runprocess` function.

Note that the build system automatically ignores this setting when you run MATLAB in batch mode, which is typically the case for CI systems.

This property is equivalent to the **Suppress outputs to command window** setting in the Process Advisor Settings dialog box.

Example: `true`

Data Types: `logical`

Run-Time Settings

`DetectDuplicateOutputs` — Generate error message when multiple tasks attempt to write to same output file
`1` (`true`) (default) | `0` (`false`)

Setting that controls whether the build system generates an error message when multiple tasks attempt to write to the same output file, specified as a numeric or logical `1` (`true`) or `0` (`false`).

By default, the build system generates an error if multiple tasks attempt to write to the same output file.

This property is equivalent to the **Detect duplicate outputs** setting in the Process Advisor Settings dialog box.

Example: `false`

Data Types: `logical`

`GarbageCollectTaskOutputs` — Setting for automatically cleaning task results for tasks and artifacts that do not match current process model or project
`true` or `1` (default) | `false` or `0`

Setting for automatically cleaning task results for tasks and artifacts that do not match current process model or project, specified as a numeric or logical `1` (`true`) or `0` (`false`).

By default, when you use the build system, the build system cleans task results that are not relevant for the current process model or project. For example, if you had task results from a specific task and then you remove that task from the process model, the build system automatically deletes the task results associated with the task. If you had task results associated with a specific project artifact and then you removed that artifact from the project, the build system automatically deletes the task results associated with the artifact. Note that the build system does not delete generated artifacts like generated code.

If you specify `GarbageCollectTaskOutputs` as `false`, the build system does not automatically clean task results associated with tasks and artifacts that are not in the current process model or project.

This property is equivalent to the **Garbage collect task outputs** setting in the Process Advisor Settings dialog box.

Example: `false`

Data Types: `logical`

`FilteredDigitalThreadMessages` — List of filtered digital thread messages
`[13×1 string]` (default) | string

List of filtered digital thread messages, specified as a string.

By default, Process Advisor and the build system do not display certain messages from the digital thread. You can add or remove messages in the list, or reset the list of filtered messages, by using the `padv.Preferences` object functions. For information, see the “Object Functions” on page 4-31 for `padv.Preferences`.

Data Types: `string`

`ShowDetailedErrorMessages` — Setting to show more information in error messages
`false` or `0` (default) | `true` or `1`

Setting to show more information in error messages, specified as a numeric or logical `0` (`false`) or `1` (`true`).

By default, error messages from the build system are not verbose.

If you specify `ShowDetailedErrorMessages` as `true`, the build system shows full stack traces in error messages. You might want to see full stack traces when you are debugging a process model.

This property is equivalent to the **Show detailed error messages** setting in the Process Advisor Settings dialog box.

Example: `true`

Data Types: `logical`

`TrackProcessModel` — Setting for tracking changes to process model
`true` or `1` (default) | `false` or `0`

Setting for tracking changes to process model, specified as a numeric or logical `1` (`true`) or `0` (`false`).

By default, if you make a change to the process model file, the build system marks each task status and task result as outdated because the tasks in the updated process model might not match the tasks that generated the task results from the previous version of the process model. For example, if you ran the built-in task `padv.builtin.task.RunModelStandards` with the default Model Advisor configuration, updated the process model to specify a different Model Advisor configuration file for the task, and then ran the task again, the task results are now outdated because they are the task results from the default configuration.

If you specify `TrackProcessModel` as `false` and make a change to the process model, the build system will not mark the task statuses and task results as outdated.

This property is equivalent to the **Add process model as dependency** setting in the Process Advisor Settings dialog box.

Example: `false`

Data Types: `logical`

Object Functions

- `addFilteredDigitalThreadMessages(obj, IssueId)` adds the message, specified by the issue ID `IssueId`, to the list of filtered messages in the property `FilteredDigitalThreadMessages`.

  To get a list of issue messages and issue IDs, use the function `getArtifactIssues`:

  ```
  metric_engine = metric.Engine();
  issues = getArtifactIssues(metric_engine)
  issuesMessages = issues.IssueMessage
  issueIDs = issues.IssueId
  ```

  Suppose that you want to filter out the issue message associated with the issue ID `"alm:artifact_service:CannotResolveElement"`. You can use the function `addFilteredDigitalThreadMessages` to add the issue message to the list of filtered messages:

  ```
  p = padv.Preferences;
  addFilteredDigitalThreadMessages(p,...
  "alm:artifact_service:CannotResolveElement")
  ```

- `removeFilteredDigitalThreadMessages(obj, IssueId)` removes the message, specified by `messageID`, to the list of filtered messages in the property `FilteredDigitalThreadMessages`.

  For example:

  ```
  p = padv.Preferences;
  removeFilteredDigitalThreadMessages(p,...
  "alm:simulink_handlers:ModelCallbacksDeactivated")
  ```
- `resetFilteredDigitalThreadMessages(obj)` resets the list of filtered messages in the property `FilteredDigitalThreadMessages`.

  For example:

  ```
  p = padv.Preferences;
  resetFilteredDigitalThreadMessages(p)
  ```

Examples

Specify Preferences for Builds

Use `padv.Preferences` to specify preferences for the Process Advisor app and build system.

Create a `padv.Preferences` object.

```
PREF = padv.Preferences
```

Specify `IncrementalBuild` as `0`.

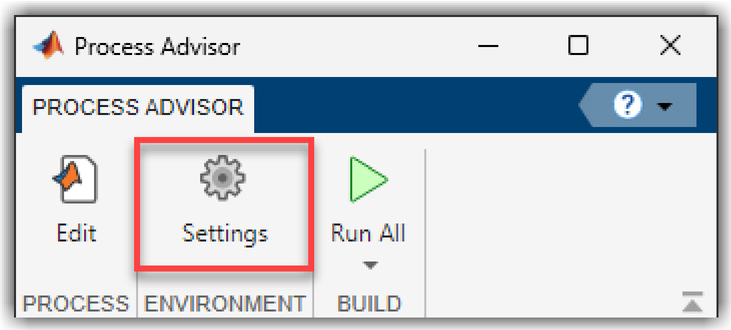
```
PREF.IncrementalBuild = 0;
```

Now, when you run tasks, incremental builds are disabled and the build system forces tasks to run, even if the tasks have up to date results.

Alternative Functionality

App

In Process Advisor, in the toolstrip, click **Settings** to access and change the settings for the build system.



Version History

R2022b: `padv.Preferences` class will be removed in a future release
Warns starting in R2022b

The class `padv.Preferences` will be removed in a future release. Update your code to replace instances of `padv.Preferences` with either `padv.UserSettings.get()` or `padv.ProjectSettings.get()`, depending on which property you need to access.

`padv.Preferences` Property	**Update**
`DetectDuplicateOutputs`	Replace instances of `padv.Preferences` with `padv.UserSettings.get()`.
`GarbageCollectTaskOutputs`	
`ShowDetailedErrorMessages`	
`TrackProcessModel`	
`FilteredDigitalThreadMessages`	Replace instances of `padv.Preferences` with `padv.ProjectSettings.get()`.
`IncrementalBuild`	
`EnableModelCaching`	
`MaxNumModelsInCache`	
`MaxNumTestResultsInCache`	
`SuppressOutputWhenInteractive`	

For example:

Functionality	**Use This Instead**

`% changing run-time setting`
`p1 = padv.Preferences;`
`p1.DetectDuplicateOutputs = false;`
	`p1 = padv.UserSettings.get();`
	`p1.DetectDuplicateOutputs = false;`

`% changing project setting`
`p1 = padv.Preferences;`
`p1.IncrementalBuild = false;`
	`p1 = padv.ProjectSettings.get();`
	`p1.IncrementalBuild = false;`

padv.ProjectSettings Class

Namespace: padv

Build system settings for project

Description

The padv.ProjectSettings class is a handle class.

Creation

Syntax

padv.ProjectSettings

Description

padv.ProjectSettings is a handle class that you can use to customize the behavior of the build system. These behaviors impact how the Process Advisor app and runprocess function run tasks. For example, you can use the project settings to use incremental builds, enable model caching, and customize other behaviors.

Project settings are persistent, are stored in the project, and are shared with everyone using the project. There is only one set of project settings for a project. To get the active project settings object, use the get method.

To specify settings that apply only to your machine, use padv.UserSettings.

Properties

IncrementalBuild — Automatically detect changes and mark task results as outdated
1 (true) | 0 (false)

Automatically detect changes and mark task results as outdated, specified as a numeric or logical 1 (true) or 0 (false).

When IncrementalBuild is true and you make a change to an artifact in your project, the build system marks related task results as outdated.

This property is equivalent to the **Incremental build** setting in the Process Advisor Settings dialog box.

Example: true

Data Types: logical

EnableModelCaching — Allow build system to cache models during build
0 (false) | 1 (true)

Allow the build system to cache models during a build, specified as a numeric or logical `1` (`true`) or `0` (`false`).

If you specify the property `EnableModelCaching` as `true`, you allow the build system to cache models instead of reloading the same models multiple times within a build. For more information, see “Cache Models and Other Artifacts Used During Build”.

This property is equivalent to the **Enable model caching** setting in the Process Advisor Settings dialog box.

Example: `true`

Data Types: `logical`

`MaxNumModelsInCache` — Maximum number of models in cache
`1` (default) | positive value

Maximum number of models in the model cache, specified as a positive value.

For more information, see “Cache Models and Other Artifacts Used During Build”.

Example: `2`

`MaxNumTestResultsInCache` — Maximum number of test results in cache
`20` (default) | positive value

Maximum number of test results in the cache, specified as a positive value.

For more information, see “Cache Models and Other Artifacts Used During Build”.

Example: `30`

`SuppressOutputWhenInteractive` — Suppress command-line output from Process Advisor
`0` (`false`) (default) | `1` (`true`)

Suppress command-line output from Process Advisor during interactive MATLAB sessions, specified as a numeric or logical `1` (`true`) or `0` (`false`).

You can use this setting to suppress command-line outputs from the build system, such as the build log and task execution messages from Process Advisor and the `runprocess` function.

Note that the build system automatically ignores this setting when you run MATLAB in batch mode, which is typically the case for CI systems.

This property is equivalent to the **Suppress outputs to command window** setting in the Process Advisor Settings dialog box. If you want to override this setting when you use the function `runprocess`, you can use the `runprocess` argument `SuppressOutputWhenInteractive`.

Example: `true`

Data Types: `logical`

`ShowFileExtension` — Show file extensions for task iteration artifacts
`0` (`false`) (default) | `1` (`true`)

Show file extensions for task iteration artifacts, specified as a numeric or logical `1` (`true`) or `0` (`false`).

By default, queries strip file extensions from the `Alias` property of each task iteration artifact. The `Alias` property controls the display name for the artifact in the **Tasks** column in Process Advisor.

To show file extensions for all task iteration artifacts in the **Tasks** column, specify this setting as `true`. To keep file extensions in the results for a specific query, specify the query property `ShowFileExtension` as `true`.

This property is equivalent to the **Show file extensions** setting in the Process Advisor Settings dialog box.

Example: `true`

Data Types: `logical`

`HandleUntrackedIO` — Build system behavior when there are untracked I/O files
`"Warn"` (default) | `"Allow"` | `"Error"`

Build system behavior when there are untracked I/O files, specified as either:

- `"Allow"` — Do not generate warnings or errors for untracked I/O files.
- `"Warn"` — Generate a warning if a task has untracked I/O files. In Process Advisor, the **I/O** column shows a warning icon ⚠.
- `"Error"` — Generate an error if a task has untracked I/O files.

Note that if you make a change to an untracked file, Process Advisor and the build system *do not* mark the task as outdated. Make sure that task inputs or outputs that appear as **Untracked** do not need to be tracked to maintain the task status and result information that you need for your project.

If you change the value of `HandleUntrackedIO`, the build system uses that behavior the next time you run a task. This property is equivalent to the **Untracked dependency behavior** setting in the Process Advisor Settings dialog box.

Example: `"Allow"`

`FilteredDigitalThreadMessages` — List of filtered digital thread messages
`[13×1 string]` (default) | string

List of filtered digital thread messages, specified as a string.

By default, Process Advisor and the build system do not display certain messages from the digital thread. You can add or remove messages in the list, or reset the list of filtered messages, by using the methods for `padv.ProjectSettings`. For information, see Filter Messages.

Data Types: `string`

`DetectMultipleProcessModels` — Detect multiple process model files
`"Off"` (default) | `"Error"` | `"Warning"`

Detect multiple process model files, specified as either:

- `"Off"` — The build system does not generate an error or warning when there are multiple process model files on the project path.
- `"Error"` — The build system generates an error when there are multiple process model files on the project path.

- `"Warning"` — The build system generates a warning when there are multiple process model files on the project path.

To avoid unexpected behavior, make sure only one `processmodel` file is on the project path.

Example: `"Warning"`

Data Types: `string`

Methods

Public Methods

Get or Reset Settings for Project

Method	Description
`get`	Get build system settings for current project `PREF = padv.ProjectSettings.get()`

`resetToDefaultValues`	Reset build system settings for current project
	
	`PREF.resetToDefaultValues()`
	
	To see the changes, use the `get` method to get the latest setting values.
	
	`PREF = padv.ProjectSettings.get()`

Filter Messages

Method	Description

`addFilteredDigitalThreadMessages`	Add message to list of filtered messages
	
	`ps = padv.ProjectSettings.get();`
	`ps.addFilteredDigitalThreadMessages(...`
	`"alm:artifact_service:CannotResolveElement");`
	
	To get a list of issue messages and issue IDs, use the function `getArtifactIssues`:
	
	`metric_engine = metric.Engine();`
	`issues = getArtifactIssues(metric_engine)`
	`issuesMessages = issues.IssueMessage`
	`issueIDs = issues.IssueId`

`removeFilteredDigitalThreadMessages`	Remove message from list of filtered messages
	
	`ps = padv.ProjectSettings.get();`
	`ps.removeFilteredDigitalThreadMessages(...`
	`"alm:simulink_handlers:ModelCallbacksDeactivated");`

`resetFilteredDigitalThreadMessages`	Reset list of filtered messages
	
	`ps = padv.ProjectSettings.get();`
	`ps.resetFilteredDigitalThreadMessages();`

Examples

Get Build System Settings for Project

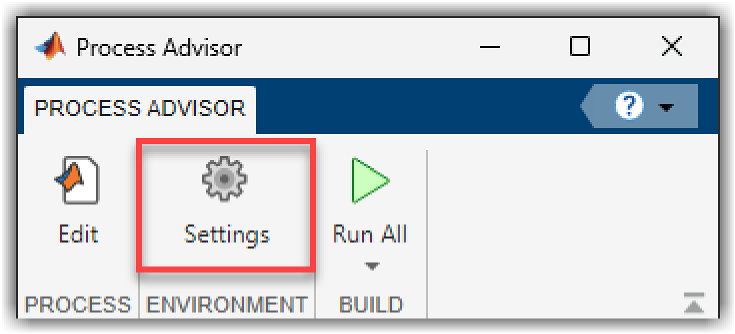
Get for build system settings for the currently open project.

```
PREF = padv.ProjectSettings.get()
```

Alternative Functionality

App

In Process Advisor, in the toolstrip, click **Settings** to access and change the settings for the build system.



padv.UserSettings Class

Namespace: padv

Build system settings for user

Description

The padv.UserSettings class is a handle class.

Creation

Syntax

padv.UserSettings

Description

padv.UserSettings is a handle class that you can use to customize the behavior of the build system on your machine. These behaviors impact how the Process Advisor app and runprocess function run tasks on your machine. For example, you can use the user settings to show detailed error messages, remove the process model as a dependency, and customize other behaviors.

User settings are persistent and do not reset when you restart MATLAB or call clear classes. There is only one set of user settings. To get the active user settings object, use the get method.

To specify settings that apply to everyone that uses your project, use padv.ProjectSettings.

Properties

DetectDuplicateOutputs — Generate error message when multiple tasks attempt to write to same output file
1 (true) (default) | 0 (false)

Setting that controls whether the build system generates an error message when multiple tasks attempt to write to the same output file, specified as a numeric or logical 1 (true) or 0 (false).

By default, the build system generates an error if multiple tasks attempt to write to the same output file.

This property is equivalent to the **Detect duplicate outputs** setting in the Process Advisor Settings dialog box.

Example: false

Data Types: logical

GarbageCollectTaskOutputs — Setting for automatically cleaning task results for tasks and artifacts that do not match current process model or project
true or 1 (default) | false or 0

Setting for automatically cleaning task results for tasks and artifacts that do not match current process model or project, specified as a numeric or logical `1` (`true`) or `0` (`false`).

By default, when you use the build system, the build system cleans task results that are not relevant for the current process model or project. For example, if you had task results from a specific task and then you remove that task from the process model, the build system automatically deletes the task results associated with the task. If you had task results associated with a specific project artifact and then you removed that artifact from the project, the build system automatically deletes the task results associated with the artifact. Note that the build system does not delete generated artifacts like generated code.

If you specify `GarbageCollectTaskOutputs` as `false`, the build system does not automatically clean task results associated with tasks and artifacts that are not in the current process model or project.

This property is equivalent to the **Garbage collect task outputs** setting in the Process Advisor Settings dialog box.

Example: `false`

Data Types: `logical`

`ShowDetailedErrorMessages` — Setting to show more information in error messages
`false` or `0` (default) | `true` or `1`

Setting to show more information in error messages, specified as a numeric or logical `0` (`false`) or `1` (`true`).

By default, error messages from the build system are not verbose.

If you specify `ShowDetailedErrorMessages` as `true`, the build system shows full stack traces in error messages. You might want to see full stack traces when you are debugging a process model.

This property is equivalent to the **Show detailed error messages** setting in the Process Advisor Settings dialog box.

Example: `true`

Data Types: `logical`

`TrackProcessModel` — Setting for tracking changes to process model
`true` or `1` (default) | `false` or `0`

Setting for tracking changes to process model, specified as a numeric or logical `1` (`true`) or `0` (`false`).

By default, if you make a change to the process model file, the build system marks each task status and task result as outdated because the tasks in the updated process model might not match the tasks that generated the task results from the previous version of the process model. For example, if you ran the built-in task `padv.builtin.task.RunModelStandards` with the default Model Advisor configuration, updated the process model to specify a different Model Advisor configuration file for the task, and then ran the task again, the task results are now outdated because they are the task results from the default configuration.

If you specify `TrackProcessModel` as `false` and make a change to the process model, the build system will not mark the task statuses and task results as outdated.

This property is equivalent to the **Add process model as dependency** setting in the Process Advisor Settings dialog box.

Example: `false`

Data Types: `logical`

Methods

Public Methods

Get Settings for User

Method	Description
`get`	Get build system settings for current user `PREF = padv.UserSettings.get()`

`resetToDefaultValues`	Reset build system settings for current user
	
	`PREF.resetToDefaultValues()`
	
	To see the changes, use the `get` method to get the latest setting values.
	
	`PREF = padv.UserSettings.get()`

Examples

Get Build System Settings for User

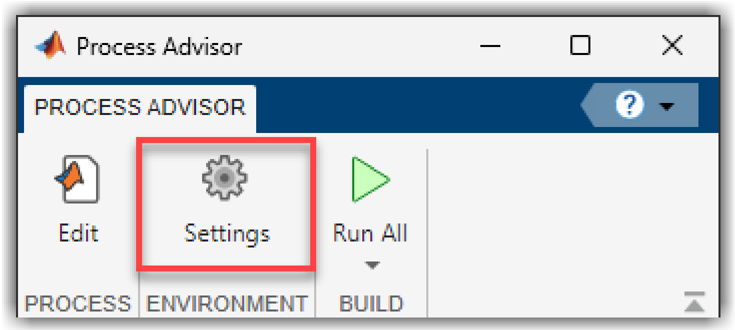
Get for build system settings for the current user.

```
PREF = padv.UserSettings.get()
```

Alternative Functionality

App

In Process Advisor, in the toolstrip, click **Settings** to access and change the settings for the build system.



Pipeline Generator API

The support package provides example pipeline configuration files that you can add to your project to automatically execute your pipeline on a continuous integration (CI) platform, like GitHub® Actions, GitLab®, and Jenkins®. The example pipeline configuration files use the pipeline generator API to automatically generate and execute pipelines for your specific project and process so that you do not need to manually update pipeline files when you make changes to your project.

For examples of how to integrate into a specific CI platform, see the "Integrate into CI" chapter in the user's guide.

Classes

CI Platform Options

Class	Description
`padv.pipeline.GitHubOptions`	Settings that control how a generated GitHub pipeline runs
`padv.pipeline.GitLabOptions`	Settings that control how a generated GitLab pipeline runs
`padv.pipeline.JenkinsOptions`	Settings that control how a generated Jenkins pipeline runs

Functions

Generate Pipeline for CI

Function	Description
`padv.pipeline.generatePipeline`	Generate pipeline configuration file for CI platform

padv.pipeline.generatePipeline

Namespace: `padv.pipeline`

Generate pipeline file for CI platform

Syntax

```
generatorResults = padv.pipeline.generatePipeline(platformOptions)
generatorResults = padv.pipeline.generatePipeline( ___ ,processName)
```

Description

`generatorResults = padv.pipeline.generatePipeline(platformOptions)` generates a pipeline file for the CI platform and options specified by `platformOptions`. The function `padv.pipeline.generatePipeline` is a pipeline generator that can automatically generate a pipeline file. The generated pipeline file can configure a pipeline that runs your process in CI.

`generatorResults = padv.pipeline.generatePipeline( ___ ,processName)` generates a pipeline file for the process specified by `processName`. By default, the pipeline generator generates a pipeline file for the default process in the process model.

Examples

Generate YML File for GitLab Pipeline

Suppose that you want to run your process using GitLab.

```
padv.pipeline.generatePipeline(padv.pipeline.GitLabOptions)
```

The generated pipeline file is `'simulink_pipeline.yml'`.

For information on how to use the pipeline generator to integrate into GitLab, see "Integrate into GitLab" in the User's Guide PDF.

Generate Jenkinsfile for Jenkins Pipeline

Suppose that you want to run your process using Jenkins.

```
padv.pipeline.generatePipeline(padv.pipeline.JenkinsOptions)
```

The generated pipeline file is `'simulink_pipeline'`.

For information on how to use the pipeline generator to integrate into Jenkins, see "Integrate into Jenkins" in the User's Guide PDF.

Input Arguments

`platformOptions` — Options for generating CI pipeline
`padv.pipeline.GitLabOptions` object | `padv.pipeline.JenkinsOptions` object

Options for generating CI pipeline, specified as:

- A `padv.pipeline.GitLabOptions` object to generate a YML file that you can use to run the generated pipeline in a GitLab CI system.
- A `padv.pipeline.JenkinsOptions` object to generate a Jenkinsfile that you can use to run the generated pipeline in Jenkins CI system.

Example: `padv.pipeline.generatePipeline(padv.pipeline.GitLabOptions)`

Example: `padv.pipeline.generatePipeline(padv.pipeline.JenkinsOptions)`

`processName` — Process name
string

Process name, specified as a string.

Example: `"CIPipeline"`

Data Types: `string`

Output Arguments

`generatorResults` — Results from pipeline generator
`padv.pipeline.GeneratorResults` object

Results from pipeline generator, returned as a `padv.pipeline.GeneratorResults` object. The filename for the generated pipeline file is stored in the property `GeneratedPipelineFiles`.

padv.pipeline.GitHubOptions

Options for generating pipeline configuration file for GitHub

Description

Use the `padv.pipeline.GitHubOptions` object to represent the desired options for generating a GitHub pipeline configuration file. To generate a GitHub pipeline configuration file, use `padv.pipeline.GitHubOptions` as an input argument to the `padv.pipeline.generatePipeline` function.

Note For information on how to use the pipeline generator to integrate into a GitHub CI system, see "Integrate into GitHub" in the User's Guide PDF.

Note If you run MATLAB using the `-nodisplay` option or you use a machine that does not have a display (like many CI runners and Docker® containers), you should set up a virtual display server before you include the following built-in tasks in your process model:

- **Generate SDD Report**
- **Generate Simulink Web View**
- **Generate Model Comparison**

For information, see "Set Up Virtual Display for No-Display Machine" in the User's Guide.

Creation

Description

`options = padv.pipeline.GitHubOptions` returns configuration options for generating a GitHub pipeline configuration file.

`options = padv.pipeline.GitHubOptions(Name=Value)` sets properties using one or more name-value arguments. For example, `padv.pipeline.GitHubOptions(RunnerLabels = "Linux")` creates an options object that specifies that a generated pipeline configuration file use `Linux` as the GitHub Action runner label.

Properties

`RunnerLabels` — GitHub runner labels
`"self-hosted"` (default) | string

GitHub runner labels, specified as a string.

The labels determine which GitHub runner can execute the job. For more information, see https://docs.github.com/en/actions/using-jobs/choosing-the-runner-for-a-job#targeting-runners-in-a-group.

Example: `padv.pipeline.GitHubOptions(RunnerLabels = "Linux")`

Data Types: `string`

`ArtifactZipFileName` — Name of ZIP file for job artifacts
`"padv_artifacts.zip"` (default) | string

Name of ZIP file for job artifacts, specified as a string.

Example: `padv.pipeline.GitHubOptions(ArtifactZipFileName = "my_job_artifacts.zip")`

Data Types: `string`

`RetentionDays` — How many days GitHub stores workflow artifacts
`"30"` (default) | string

How many days GitHub stores workflow artifacts, specified as a string. This property corresponds to the job keyword `"retention-days"` in GitHub. After the specified number of retention days, the artifacts expire and GitHub deletes the artifacts.

Example: `padv.pipeline.GitHubOptions(RetentionDays = "90")`

Data Types: `string`

`GeneratedYMLFileName` — File name of generated GitLab pipeline file
`"simulink_pipeline"` (default) | string

File name of generated GitLab pipeline file, specified as a string.

By default, the generated pipeline generates into the subfolder **derived** > **pipeline**, relative to the project root. To change where the pipeline file generates, specify `GeneratedPipelineDirectory`.

Example: `padv.pipeline.GitHubOptions(GeneratedYMLFileName = "padv_generated_pipeline_file")`

Data Types: `string`

`MatlabInstallationLocation` — Path to MATLAB installation location
`"PATH_TO_MATLAB"` (default) | string

Path to MATLAB installation location, specified as a string.

Make sure the path that you specify uses the MATLAB root folder location and file separators for the operating system of your GitHub runner.

Example: `"C:\Program Files\MATLAB\R2023a\bin"`

Example: `"/usr/local/MATLAB/R2023a/bin"`

Example: `"/Applications/MATLAB_R2023a.app/bin"`

Data Types: `string`

`EnableArtifactCollection` — When to collect build artifacts
`"always"`, `1`, or `true` (default) | `"never"`, `0`, or `false` | `"on_success"` | `"on_failure"`

When to collect build artifacts, specified as:

- `"never"`, `0`, or `false` — Never collect artifacts
- `"on_success"` — Only collect artifacts when the pipeline succeeds

- `"on_failure"` — Only collect artifacts when the pipeline fails
- `"always"`, `1`, or `true` — Always collect artifacts

If the pipeline collects artifacts, the child pipeline contains a job, `Collect_Artifacts`, that compresses the build artifacts into a ZIP file and attaches the file to the job.

Example: `padv.pipeline.GitHubOptions(EnableArtifactCollection=false)`

Data Types: `logical` | `string`

`ShellEnvironment` — Shell environment GitHub uses to launch MATLAB
`"bash"` (default) | "pwsh"

Shell environment GitHub uses to launch MATLAB, specified as one of these values:

- `"bash"` — UNIX® shell script
- `"pwsh"` — PowerShell Core script

Example: `padv.pipeline.GitHubOptions(ShellEnvironment = "pwsh")`

Data Types: `string`

`CheckoutSubmodules` — Checkout Git™ submodules
`"false"` (default) | `"true"` | `"recursive"`

Checkout Git submodules at the beginning of each pipeline stage, specified as either:

- `"false"`
- `"true"`
- `"recursive"`

This property uses the GitHub Action `checkout@v3`. For information about the submodule input values, see https://github.com/marketplace/actions/checkout-submodules.

Example: `padv.pipeline.GitHubOptions(CheckoutSubmodules = "true")`

Data Types: `string`

`RunprocessCommandOptions` — Options for runprocess command
`padv.pipeline.RunProcessOptions` (default) | `padv.pipeline.RunProcessOptions` object

Options for `runprocess` command, specified as a `padv.pipeline.RunProcessOptions` object. `padv.pipeline.RunProcessOptions` has properties for each name-value argument in the `runprocess` function.

For example, to have the pipeline generator use a command like `runprocess(DryRun = true)` in GitHub, you can create a `padv.pipeline.RunProcessOptions` object, specify the property values, and pass the object to `padv.pipeline.GitHubOptions`:

```
rpo = padv.pipeline.RunProcessOptions;
rpo.DryRun = true;
gho = padv.pipeline.GitHubOptions(RunprocessCommandOptions = rpo);
```

Example: `padv.pipeline.RunProcessOptions`

`PipelineArchitecture` — Number of stages and grouping of tasks in CI pipeline
`padv.pipeline.Architecture.SingleStage` (default) |
`padv.pipeline.Architecture.IndependentModelPipelines` |

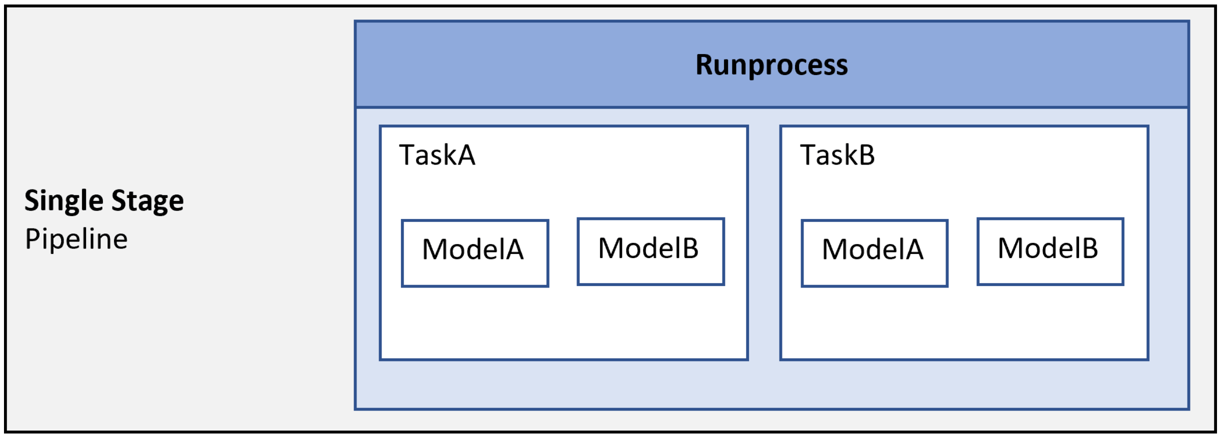
padv.pipeline.Architecture.SerialStages |
padv.pipeline.Architecture.SerialStagesGroupPerTask

Number of stages and grouping of tasks in CI pipeline, specified as either:

- `padv.pipeline.Architecture.SingleStage` — Single stage runs all tasks

  For example, a pipeline with one stage that runs each of the tasks in the process:

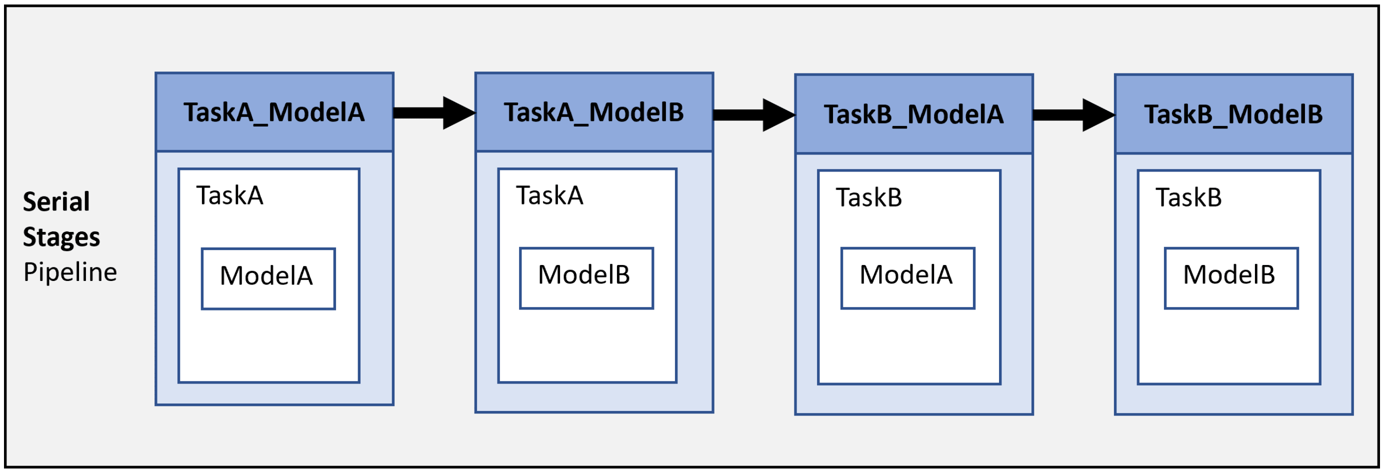
  1 **Runprocess**



- `padv.pipeline.Architecture.SerialStages` — One stage for each task iteration

  For example, a pipeline with four stages:

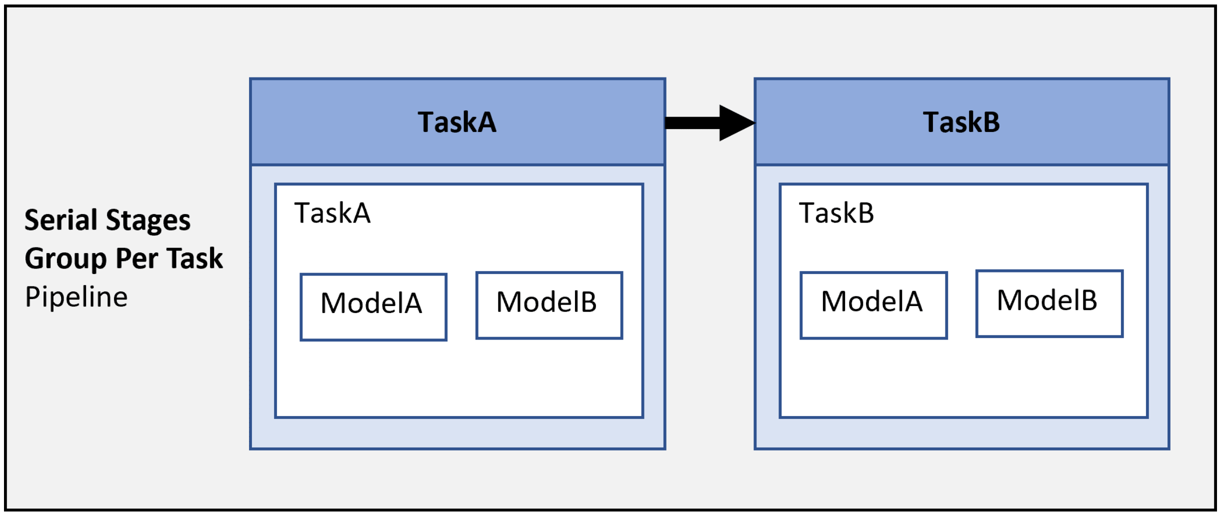
  1 **TaskA_ModelA** — Runs a task `TaskA` on the model `ModelA`
  2 **TaskA_ModelB** — Runs a task `TaskA` on the model `ModelB`
  3 **TaskB_ModelA** — Runs a task `TaskB` on the model `ModelA`
  4 **TaskB_ModelB** — Runs a task `TaskB` on the model `ModelB`



- `padv.pipeline.Architecture.SerialStagesGroupPerTask` — One stage for each type of task

  For example, a pipeline with two stages:

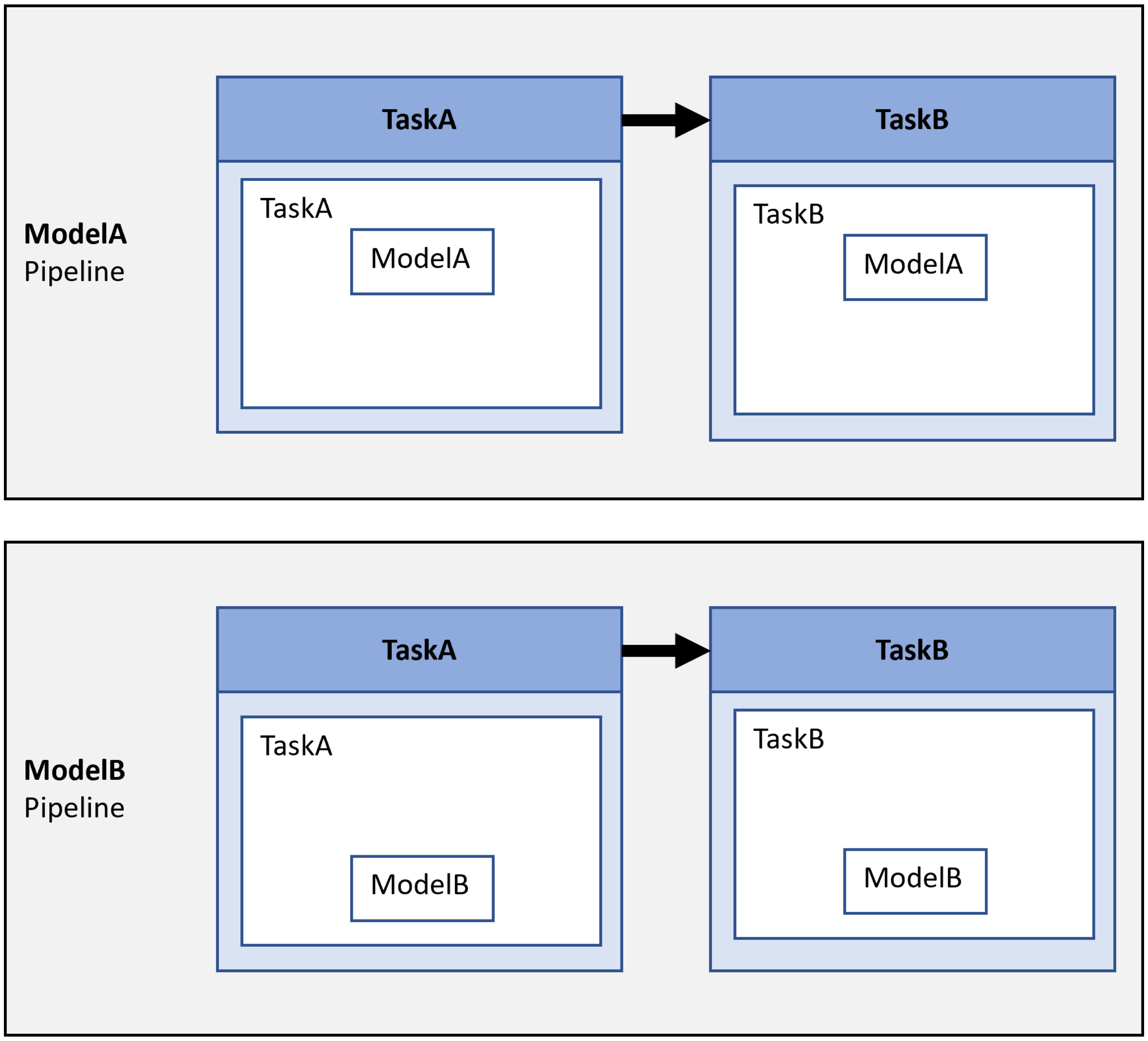
1. **TaskA** — Runs a task `TaskA` on each model in the project
2. **TaskB** — Runs a task `TaskB` on each model in the project



- `padv.pipeline.Architecture.IndependentModelPipelines`— Parallel, downstream pipelines for each model. Each pipeline independently runs the tasks associated with the model.

  For example, a pipeline with parallel downstream pipelines:

  - **ModelA** — Runs `TaskA` and `TaskB` on `ModelA`.
  - **ModelB** — Runs `TaskA` and `TaskB` on `ModelB`.



Example: `padv.pipeline.GitHubOptions(PipelineArchitecture = padv.pipeline.Architecture.SerialStages)`

`MatlabLaunchCmd` — Command to start MATLAB program
`"matlab"` (default) | string

Command to start MATLAB program, specified as a string.

Use this property to specify how the pipeline starts the MATLAB program. This property defines how the script in the generated pipeline file launches MATLAB.

Example: `padv.pipeline.GitHubOptions(MatlabLaunchCmd = "matlab")`

Data Types: `string`

`MatlabStartupOptions` — Command-line startup options for MATLAB
`"-nodesktop -logfile output.log"` (default) | string

Command-line startup options for MATLAB, specified as a string.

Use this property to specify the command-line startup options that the pipeline uses when starting the MATLAB program. This property defines the command-line startup options that appear next to the `-batch` option and `MatlabLaunchCmd` value in the`"script"` section of the generated pipeline file. The pipeline starts MATLAB with the specified startup options.

By default, the support package launches MATLAB using the `-batch` option. If you need to run MATLAB without the `-batch` option, specify the property `AddBatchStartupOption` as false.

Note If you run MATLAB using the `-nodisplay` option or you use a machine that does not have a display (like many CI runners and Docker containers), you should set up a virtual display server before you include the following built-in tasks in your process model:

- **Generate SDD Report**
- **Generate Simulink Web View**
- **Generate Model Comparison**

For information, see "Set Up Virtual Display for No-Display Machine" in the User's Guide.

Example: `padv.pipeline.GitHubOptions(MatlabStartupOptions = "-nodesktop -logfile mylogfile.log")`

Data Types: `string`

`AddBatchStartupOption` — Specify whether to open MATLAB using `-batch` startup option
`1` (`true`) (default) | `0` (`false`)

Specify whether to open MATLAB using `-batch` startup option, specified as a numeric or logical `0` (`false`) or `1` (`true`).

By default, the support package launches MATLAB in CI using the `-batch` startup option.

If you need to launch MATLAB with options that are not compatible with `-batch`, specify `AddBatchStartupOption` as `false`.

Example: `padv.pipeline.GitHubOptions(AddBatchStartupOption = false)`

Data Types: `logical`

`GeneratedPipelineDirectory` — Specify where the generated pipeline file generates
`fullfile("derived","pipeline")` (default) | string

Specify where the generated pipeline file generates, specified as a string.

This property defines the directory where the generated pipeline file generates.

By default, the generated pipeline file is named `"simulink_pipeline.yml"`. To change the name of the generated pipeline file, specify `GeneratedYMLFileName`.

Example: `padv.pipeline.GitHubOptions(GeneratedPipelineDirectory = fullfile("derived","pipeline","test"))`

Data Types: `string`

`GenerateReport` — Generate Process Advisor build report
`true` or `1` (default) | `false` or `0`

Generate Process Advisor build report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `padv.pipeline.GitHubOptions(GenerateReport = false)`

Data Types: `logical`

`ReportFormat` — File format for generated report
`"pdf"` (default) | `"html"` | `"html-file"` | `"docx"`

File format for the generated report, specified as one of these values:

- `"pdf"` — PDF file
- `"html"` — HTML report, packaged as a zipped file that contains the HTML file, images, style sheet, and JavaScript files of the report
- `"html-file"` — HTML report
- `"docx"` — Microsoft Word document

Example: `padv.pipeline.GitHubOptions(ReportFormat = "html-file")`

`ReportPath` — Name and path of generated report
`"ProcessAdvisorReport"` (default) | string array

Name and path of generated report, specified as a string array.

By default, the report path uses a relative path to the project root and the pipeline generator generates a report `ProcessAdvisorReport.pdf`.

Example: `padv.pipeline.GitHubOptions(ReportPath = "myReport")`

Data Types: `string`

`StopOnStageFailure` — Stop running pipeline after stage fails
`0` (`false`) (default) | `1` (`true`)

Stop running pipeline after stage fails, specified as a numeric or logical `0` (`false`) or `1` (`true`).

By default, the pipeline continues to run, even if a stage in the pipeline fails.

Example: `padv.pipeline.GitHubOptions(StopOnStageFailure = true)`

Data Types: `logical`

`CheckOutdatedResultsAfterMerge` — Check for outdated results after merge
`1` (`true`) (default) | `0` (`false`)

Check for outdated results after merge, specified as a numeric or logical `1` (`true`) or `0` (`false`).

When specified as `true`, the pipeline checks if task results are still up-to-date after merging artifact database files from parallel jobs. Outdated results are not expected if the merge is successful. When there are outdated results, there could be an issue with the merge.

Example: `false`

Data Types: `logical`

Examples

Specify GitHub Configuration Options When Generating Pipeline Configuration File

Create a `padv.pipeline.GitHubOptions` object and change the options. When you generate a pipeline configuration file, the file uses the specified options.

This example shows how to use the pipeline generator API. For information on how to use the pipeline generator to integrate into a GitHub CI system, see "Integrate into GitHub" in the User's Guide PDF.

Load a project. For this example, you can load a Process Advisor example project. In the MATLAB Command Window, enter:

```
processAdvisorExampleStart
```

Specify your GitHub pipeline configuration options by creating a `padv.pipeline.GitHubOptions` object and modifying the object properties. For example, if you have a GitHub runner that uses a MATLAB installation at `/opt/matlab/r2023a`:

```
GitHubOptions = padv.pipeline.GitHubOptions
GitHubOptions.MatlabInstallationLocation = "/opt/matlab/r2023a";
```

Generate a GitHub pipeline configuration file by using the function `padv.pipeline.generatePipeline` with the specified options.

```
padv.pipeline.generatePipeline(GitHubOptions);
```

Note Calling `padv.pipeline.generatePipeline(GitHubOptions)` is equivalent to calling `padv.pipeline.generateGitHubPipeline(GitHubOptions)`.

By default, the generated pipeline configuration file is named `simulink_pipeline.yml` and is located under the project root, in the subfolder **derived** > **pipeline**.

The `GeneratedYMLFileName` and `GeneratedPipelineDirectory` properties of the `padv.pipeline.GitHubOptions` object control the name and location of the generated pipeline configuration file.

For information on how to use the pipeline generator to integrate into a GitHub CI system, see "Integrate into GitHub" in the User's Guide.

See Also

`padv.pipeline.generatePipeline`

Topics

"Integrate into GitHub"

padv.pipeline.GitLabOptions

Options for generating pipeline configuration file for GitLab

Description

Use the `padv.pipeline.GitLabOptions` object to represent the desired options for generating a GitLab pipeline configuration file. To generate a GitLab pipeline configuration file, use `padv.pipeline.GitLabOptions` as an input argument to the `padv.pipeline.generatePipeline` function.

Note For information on how to use the pipeline generator to integrate into a GitLab CI system, see "Integrate into GitLab" in the User's Guide PDF.

Note If you run MATLAB using the `-nodisplay` option or you use a machine that does not have a display (like many CI runners and Docker containers), you should set up a virtual display server before you include the following built-in tasks in your process model:

- **Generate SDD Report**
- **Generate Simulink Web View**
- **Generate Model Comparison**

For information, see "Set Up Virtual Display for No-Display Machine" in the User's Guide.

Creation

Syntax

```
options = padv.pipeline.GitLabOptions
options = padv.pipeline.GitLabOptions(Name=Value)
```

Description

`options = padv.pipeline.GitLabOptions` returns configuration options for generating a GitLab pipeline configuration file.

`options = padv.pipeline.GitLabOptions(Name=Value)` sets properties using one or more name-value arguments. For example, `padv.pipeline.GitLabOptions(Tags="high_memory")` creates an options object that specifies that a generated pipeline configuration file use `high_memory` as the GitLab CI/CD tag.

Properties

Tags — GitLab CI/CD tags
string | string array

GitLab CI/CD tags, specified as a string or string array. Use this property to specify the tags that appear next to the `tags` keyword in a generated GitLab pipeline configuration file.

The GitLab CI/CD tags select a GitLab Runner for a job. The property `Tags` specifies which CI/CD tags appear next to the `tags` keyword in a generated pipeline configuration file.

For more information on the `tags` keyword, see https://docs.gitlab.com/ee/ci/yaml/#tags.

Example: `options = padv.pipeline.GitLabOptions(Tags="high_memory")`

Data Types: `string`

`EnableArtifactCollection` — When to collect build artifacts
`"always"`, `1`, or `true` (default) | `"never"`, `0`, or `false` | `"on_success"` | `"on_failure"`

When to collect build artifacts, specified as:

- `"never"`, `0`, or `false` — Never collect artifacts
- `"on_success"` — Only collect artifacts when the pipeline succeeds
- `"on_failure"` — Only collect artifacts when the pipeline fails
- `"always"`, `1`, or `true` — Always collect artifacts

If the pipeline collects artifacts, the child pipeline contains a job, `Collect_Artifacts`, that compresses the build artifacts into a ZIP file and attaches the file to the job.

This property creates an `"artifacts"` section in the generated pipeline file. For more information, see the GitLab documentation: https://docs.gitlab.com/ee/ci/yaml/#artifacts.

Example: `padv.pipeline.GitLabOptions(EnableArtifactCollection="on_failure")`

Data Types: `logical` | `string`

`ArtifactZipFileName` — Name of ZIP file for job artifacts
`"padv_artifacts.zip"` (default) | string

Name of ZIP file for job artifacts, specified as a string.

This property specifies the file name that appears next to the `"name"` keyword in the generated pipeline file. For more information, see the GitLab documentation for "artifacts:name": https://docs.gitlab.com/ee/ci/yaml/#artifactsname.

Example: `padv.pipeline.GitLabOptions(ArtifactZipFileName = "my_job_artifacts.zip")`

Data Types: `string`

`ArtifactsExpireIn` — How long GitLab stores job artifacts before the artifacts expire
`"30 days"` (default) |

How long GitLab stores job artifacts before the artifacts expire, specified as a string.

Use this property to specify how long GitLab stores job artifacts before the artifacts expire and GitLab deletes the artifacts. This property specifies the expiry time that appears next to the `"expire_in"` keyword in the generated pipeline file. For a list of valid possible inputs, see the GitLab documentation for `"artifacts:expire_in"`: https://docs.gitlab.com/ee/ci/yaml/#artifactsexpire_in.

Example: `padv.pipeline.GitLabOptions(ArtifactsExpireIn = "60 days")`

Data Types: `string`

`ArtifactsWhen` — When GitLab uploads job artifacts
`"always"` (default) | `"on_success"` | `"on_failure"`

Warning This property will be removed in a future release. Use the property `EnableArtifactCollection` instead.

When GitLab uploads job artifacts, specified as either:

- `"on_success"`
- `"on_failure"`
- `"always"`

Use this property to specify when GitLab uploads job artifacts. This property specifies the input that appears next to the `"when"` keyword in the generated pipeline file. For more information, see the GitLab documentation for `"artifacts:when"`: https://docs.gitlab.com/ee/ci/yaml/#artifactswhen.

Example: `padv.pipeline.GitLabOptions(ArtifactsWhen = "on_success")`

`GeneratedYMLFileName` — File name of generated GitLab pipeline file
`"simulink_pipeline"` (default) | string

File name of generated GitLab pipeline file, specified as a string.

By default, the generated pipeline generates into the subfolder **derived** > **pipeline**, relative to the project root. To change where the pipeline file generates, specify `GeneratedPipelineDirectory`.

Example: `padv.pipeline.GitLabOptions(GeneratedYMLFileName = "padv_generated_pipeline_file")`

Data Types: `string`

`RunprocessCommandOptions` — Options for `runprocess` command
`padv.pipeline.RunProcessOptions` (default) | `padv.pipeline.RunProcessOptions` object

Options for `runprocess` command, specified as a `padv.pipeline.RunProcessOptions` object. `padv.pipeline.RunProcessOptions` has properties for each name-value argument in the `runprocess` function.

For example, to have the pipeline generator use a command like `runprocess(DryRun = true)` in GitLab, you can create a `padv.pipeline.RunProcessOptions` object, specify the property values, and pass the object to `padv.pipeline.GitLabOptions`:

```
rpo = padv.pipeline.RunProcessOptions;
rpo.DryRun = true;
glo = padv.pipeline.GitLabOptions(RunprocessCommandOptions = rpo);
```

Example: `padv.pipeline.GitLabOptions(RunprocessCommandOptions = padv.pipeline.RunProcessOptions)`

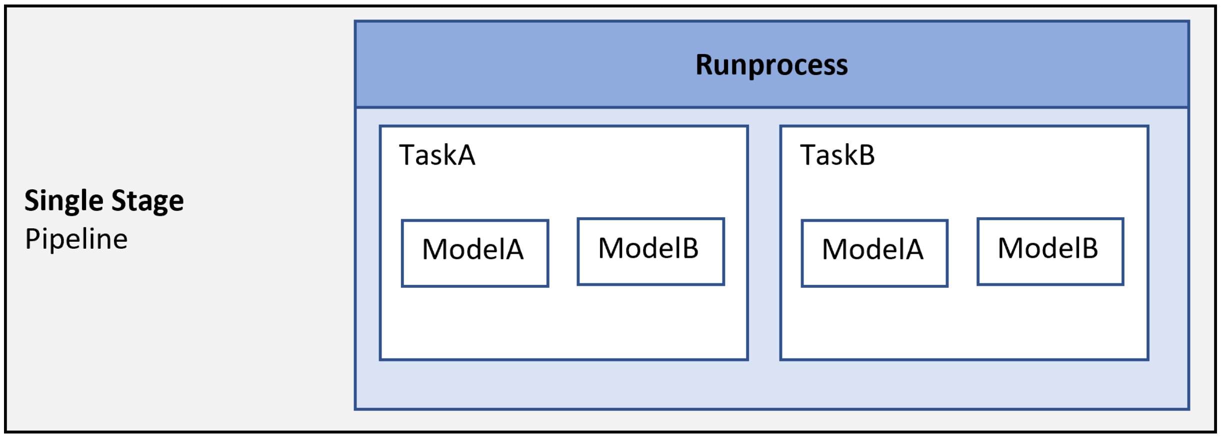
`PipelineArchitecture` — Number of stages and grouping of tasks in CI pipeline
`padv.pipeline.Architecture.SingleStage` (default) |
`padv.pipeline.Architecture.SerialStages` |
`padv.pipeline.Architecture.SerialStagesGroupPerTask`

Number of stages and grouping of tasks in CI pipeline, specified as either:

- `padv.pipeline.Architecture.SingleStage` — Single stage runs all tasks

  For example, a pipeline with one stage that runs each of the tasks in the process:

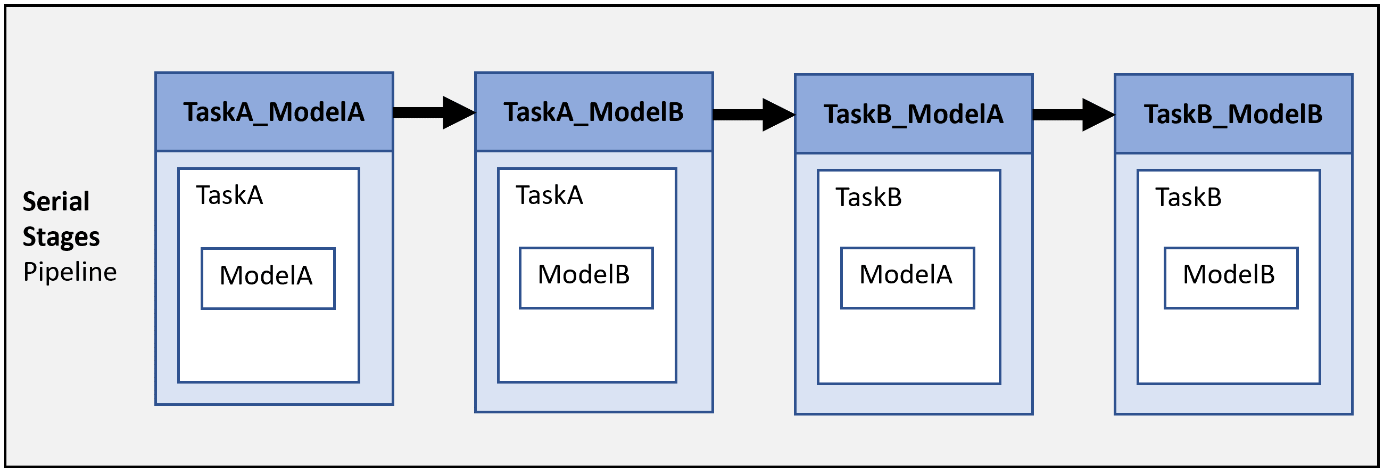
  1 **Runprocess**



- `padv.pipeline.Architecture.SerialStages` — One stage for each task iteration

  For example, a pipeline with four stages:

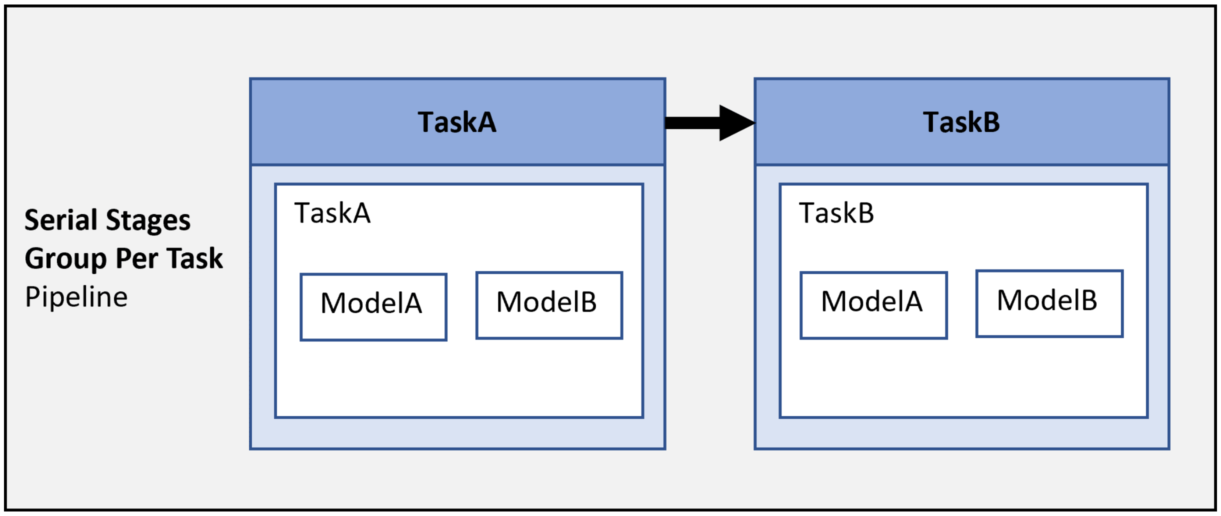
  1 **TaskA_ModelA** — Runs a task `TaskA` on the model `ModelA`
  2 **TaskA_ModelB** — Runs a task `TaskA` on the model `ModelB`
  3 **TaskB_ModelA** — Runs a task `TaskB` on the model `ModelA`
  4 **TaskB_ModelB** — Runs a task `TaskB` on the model `ModelB`



- `padv.pipeline.Architecture.SerialStagesGroupPerTask` — One stage for each type of task

For example, a pipeline with two stages:

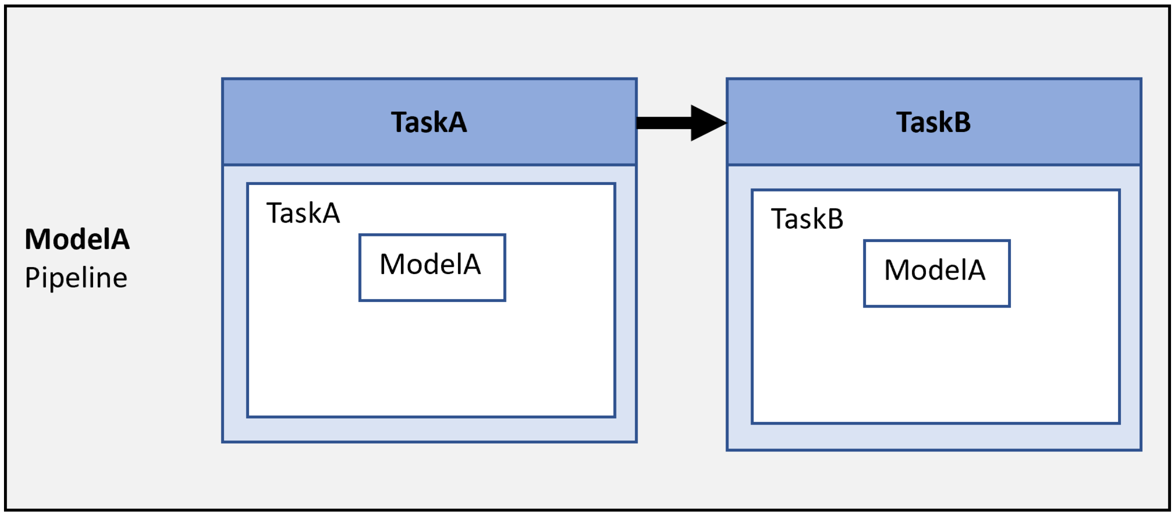
1. **TaskA** — Runs a task `TaskA` on each model in the project
2. **TaskB** — Runs a task `TaskB` on each model in the project

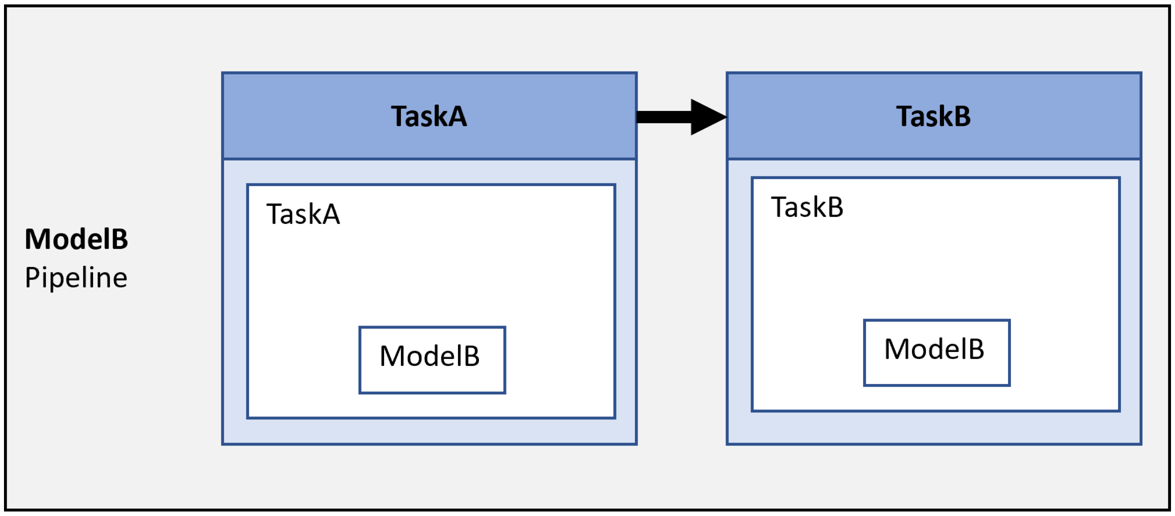


- `padv.pipeline.Architecture.IndependentModelPipelines`— Parallel, downstream pipelines for each model. Each pipeline independently runs the tasks associated with the model.

  For example, a pipeline with parallel downstream pipelines:

  - **ModelA** — Runs `TaskA` and `TaskB` on `ModelA`.
  - **ModelB** — Runs `TaskA` and `TaskB` on `ModelB`.





To make sure the jobs run in parallel, make sure that you either:

- Have multiple runners available. See https://docs.gitlab.com/ee/ci/yaml/#parallel.
- Configure your runner to run multiple jobs concurrently by specifying the `concurrent` setting. See https://docs.gitlab.com/runner/configuration/advanced-configuration.html.

For more information on pipeline architectures, see the "Customize Pipeline Architecture" section in "Integrate into GitLab" in the User's Guide PDF.

Example: `padv.pipeline.GitLabOptions(PipelineArchitecture = padv.pipeline.Architecture.SerialStages)`

`ForceRunAllTasks` — Pipeline runs both up to date and outdated tasks
`0` (`false`) (default) | `1` (`true`)

Pipeline runs both up to date and outdated tasks, specified as a numeric or logical `1` (`true`) or `0` (`false`).

The property defines the `Force` argument for the `runprocess` function in the generated pipeline file.

Example: `padv.pipeline.GitLabOptions(ForceRunAllTasks=true)`

Data Types: `logical`

`ExitInBatchMode` — Exits MATLAB if MATLAB was run with the `-batch` startup option
`1` (`true`) (default) | `0` (`false`)

Exits MATLAB if MATLAB was run with the `-batch` startup option, specified as a numeric or logical `0` (`false`) or `1` (`true`).

This property defines the `ExitInBatchMode` argument for the `runprocess` function in the generated pipeline file.

Example: `padv.pipeline.GitLabOptions(ExitInBatchMode=false)`

Data Types: `logical`

`RerunFailedTasks` — Treats tasks which previously failed as being outdated
`0` (`false`) (default) | `1` (`true`)

Treats tasks which previously failed as being outdated, specified as a numeric or logical `1` (`true`) or `0` (`false`).

This property defines the `RerunFailedTasks` argument for the `runprocess` function in the generated pipeline file.

Example: `padv.pipeline.GitLabOptions(RerunFailedTasks=true)`

Data Types: `logical`

`RerunErroredTasks` — Treats tasks which previously generated errors as outdated
`0` (`false`) (default) | `1` (`true`)

Treats tasks which previously generated errors as outdated, specified as a numeric or logical `1` (`true`) or `0` (`false`).

This property defines the `RerunErroredTasks` argument for the `runprocess` function in the generated pipeline file.

Example: `padv.pipeline.GitLabOptions(RerunErroredTasks=true)`

Data Types: `logical`

`MatlabLaunchCmd` — Command to start MATLAB program
`"matlab"` (default) | string

Command to start MATLAB program, specified as a string.

Use this property to specify how the pipeline starts the MATLAB program. This property defines how the script in the generated pipeline file launches MATLAB.

Example: `padv.pipeline.GitLabOptions(MatlabLaunchCmd = "matlab")`

Data Types: `string`

`MatlabStartupOptions` — Command-line startup options for MATLAB
`"-nodesktop -logfile output.log"` (default) | string

Command-line startup options for MATLAB, specified as a string.

Use this property to specify the command-line startup options that the pipeline uses when starting the MATLAB program. This property defines the command-line startup options that appear next to the `-batch` option and `MatlabLaunchCmd` value in the`"script"` section of the generated pipeline file. The pipeline starts MATLAB with the specified startup options.

By default, the support package launches MATLAB using the `-batch` option. If you need to run MATLAB without the `-batch` option, specify the property `AddBatchStartupOption` as false.

Note If you run MATLAB using the `-nodisplay` option, you should set up a virtual display server before you include the following built-in tasks in your process model:

- **Generate SDD Report**
- **Generate Simulink Web View**
- **Generate Model Comparison**

For information, see "Set Up Virtual Display for No-Display Machine" in the User's Guide.

Example: `padv.pipeline.GitLabOptions(MatlabStartupOptions = "-nodesktop -logfile mylogfile.log")`

Data Types: `string`

`AddBatchStartupOption` — Specify whether to open MATLAB using `-batch` startup option
`1` (`true`) (default) | `0` (`false`)

Specify whether to open MATLAB using `-batch` startup option, specified as a numeric or logical `0` (`false`) or `1` (`true`).

By default, the support package launches MATLAB in CI using the `-batch` startup option.

If you need to launch MATLAB with options that are not compatible with `-batch`, specify `AddBatchStartupOption` as `false`.

Example: `padv.pipeline.GitLabOptions(AddBatchStartupOption = false)`

Data Types: `logical`

`GeneratedPipelineDirectory` — Specify where the generated pipeline file generates
`fullfile("derived","pipeline")` (default) | string

Specify where the generated pipeline file generates, specified as a string.

This property defines the directory where the generated pipeline file generates.

By default, the generated pipeline file is named `"simulink_pipeline.yml"`. To change the name of the generated pipeline file, specify `GeneratedYMLFileName`.

Example: `padv.pipeline.GitLabOptions(GeneratedPipelineDirectory = fullfile("derived","pipeline","test"))`

Data Types: `string`

`GenerateJUnitForProcess` — Generate JUnit-style XML reports for process
`true` or `1` (default) | `false` or `0`

Generate JUnit-style XML reports for each task in the process, specified as a numeric or logical `1` (`true`) or `0` (`false`).

JUnit reports allow you see which tests failed in CI without having to examine the job logs.

If you generate JUnit reports, GitLab shows any test failures directly in the merge request and pipeline detail view. For more information on how GitLab displays JUnit results, see the GitLab documentation: https://docs.gitlab.com/ee/ci/testing/unit_test_reports.html#view-unit-test-reports-on-gitlab.

Example: `padv.pipeline.GitLabOptions(GenerateJUnitForProcess = false)`

Data Types: `logical`

`GenerateReport` — Generate Process Advisor build report
`true` or `1` (default) | `false` or `0`

Generate Process Advisor build report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `padv.pipeline.GitLabOptions(GenerateReport = false)`

Data Types: `logical`

`ReportFormat` — File format for generated report
`"pdf"` (default) | `"html"` | `"html-file"` | `"docx"`

File format for the generated report, specified as one of these values:

- `"pdf"` — PDF file
- `"html"` — HTML report, packaged as a zipped file that contains the HTML file, images, style sheet, and JavaScript files of the report
- `"html-file"` — HTML report
- `"docx"` — Microsoft Word document

Example: `padv.pipeline.GitLabOptions(ReportFormat = "html-file")`

`ReportPath` — Name and path of generated report
`"$PROJECTROOT$/ProcessAdvisorReport"` (default) | string array

Name and path of generated report, specified as a string array.

By default, the report path uses a relative path to the project root and the pipeline generator generates a report `ProcessAdvisorReport.pdf`.

Example: `padv.pipeline.GitLabOptions(ReportPath = "myReport")`

Data Types: `string`

`StopOnStageFailure` — Stop running pipeline after stage fails
`0` (`false`) (default) | `1` (`true`)

Stop running pipeline after stage fails, specified as a numeric or logical `0` (`false`) or `1` (`true`).

By default, the pipeline continues to run, even if a stage in the pipeline fails.

Example: `padv.pipeline.GitLabOptions(StopOnStageFailure = true)`

Data Types: `logical`

`CheckOutdatedResultsAfterMerge` — Check for outdated results after merge
`1` (`true`) (default) | `0` (`false`)

Check for outdated results after merge, specified as a numeric or logical `1` (`true`) or `0` (`false`).

When specified as `true`, the pipeline checks if task results are still up-to-date after merging artifact database files from parallel jobs. Outdated results are not expected if the merge is successful. When there are outdated results, there could be an issue with the merge.

Example: `false`

Data Types: `logical`

Examples

Specify GitLab Configuration Options When Generating Pipeline Configuration File

Create a `padv.pipeline.GitLabOptions` object and change the options. When you generate a pipeline configuration file, the file uses the specified options.

This example shows how to use the pipeline generator API. For information on how to use the pipeline generator to integrate into a GitLab CI system, see "Integrate into GitLab" in the User's Guide PDF.

Load a project. For this example, you can load a Process Advisor example project. In the MATLAB Command Window, enter:

```
processAdvisorExampleStart
```

Create a `padv.pipeline.GitLabOptions` object for generating a GitLab pipeline configuration file. Specify a GitLab CI/CD tag of `high_memory`, specify that the function `runprocess` should not automatically exit MATLAB after the pipeline finishes running, and a single stage pipeline architecture.

```
GitLabOptions = padv.pipeline.GitLabOptions(...
Tags = "high_memory",...
ExitInBatchMode = 0,...
PipelineArchitecture = padv.pipeline.Architecture.SingleStage);
```

Generate a GitLab pipeline configuration file by using the function `padv.pipeline.generatePipeline` with the specified options.

```
padv.pipeline.generatePipeline(GitLabOptions);
```

Note Calling `padv.pipeline.generatePipeline(GitLabOptions)` is equivalent to calling `padv.pipeline.generateGitLabPipeline(GitLabOptions)`.

By default, the generated pipeline file is named `simulink_pipeline.yml` and is saved in the **derived** > **pipeline** folder, relative to the project root. To change the name of the generated pipeline file, specify the argument `GeneratedYMLFileName` for `padv.pipeline.GitLabOptions`. To change where the pipeline file generates, specify the argument `GeneratedPipelineDirectory`.

For information on how to use the pipeline generator to integrate into a GitLab CI system, see "Integrate into GitLab" in the User's Guide.

See Also

`padv.pipeline.generatePipeline`

Topics

“Integrate into GitLab”

padv.pipeline.JenkinsOptions

Options for generating pipeline configuration file for Jenkins

Description

Use the `padv.pipeline.JenkinsOptions` object to represent the desired options for generating a Jenkins pipeline configuration file. To generate a Jenkins pipeline configuration file, use `padv.pipeline.JenkinsOptions` as an input argument to the `padv.pipeline.generatePipeline` function.

Note For information on how to use the pipeline generator to integrate into a Jenkins CI system, see "Integrate into Jenkins" in the User's Guide PDF.

Note If you run MATLAB using the `-nodisplay` option or you use a machine that does not have a display (like many CI runners and Docker containers), you should set up a virtual display server before you include the following built-in tasks in your process model:

- **Generate SDD Report**
- **Generate Simulink Web View**
- **Generate Model Comparison**

For information, see "Set Up Virtual Display for No-Display Machine" in the User's Guide.

Creation

Syntax

```
options = padv.pipeline.JenkinsOptions
options = padv.pipeline.JenkinsOptions(Name=Value)
```

Description

`options = padv.pipeline.JenkinsOptions` returns configuration options for generating a Jenkins pipeline configuration file.

`options = padv.pipeline.JenkinsOptions(Name=Value)` sets properties using one or more name-value arguments. For example, `padv.pipeline.JenkinsOptions(AgentLabel = "high_memory")` creates an object that specifies that a generated pipeline configuration file use an agent with the label `high_memory`.

Properties

`AgentLabel` — Which Jenkins agent executes pipeline tasks in Jenkins environment
`"any"` (default) | string | string array

Which Jenkins agent executes pipeline tasks in the Jenkins environment, specified as a string or string array.

Use this property to specify the Jenkins agent that executes all stages in the pipeline. Jenkins agents are typically either a machine or a container. For more information, see the "Glossary" in the Jenkins documentation: https://www.jenkins.io/doc/book/glossary/#agent.

Example: `options = padv.pipeline.JenkinsOptions(AgentLabel="high_memory")`

Data Types: `string`

`EnableArtifactCollection` — When to collect build artifacts
`"always"`, `1`, or `true` (default) | `"never"`, `0`, or `false` | `"on_success"` | `"on_failure"`

When to collect build artifacts, specified as:

- `"never"`, `0`, or `false` — Never collect artifacts
- `"on_success"` — Only collect artifacts when the pipeline succeeds
- `"on_failure"` — Only collect artifacts when the pipeline fails
- `"always"`, `1`, or `true` — Always collect artifacts

If you choose to collect artifacts, the child pipeline contains a job, `Collect_Artifacts`, that collects the build artifacts and attaches the artifacts to the `Collect_Artifacts` job.

This property uses the Jenkins Core Plugin to add an `"archiveArtifacts"` step in the generated Jenkinsfile that defines the Jenkins pipeline. Install the Jenkins Core Plugin before you specify `EnableArtifactCollection`. For more information, see the Jenkins documentation for `"archiveArtifacts"`: https://www.jenkins.io/doc/pipeline/steps/core/#archiveartifacts-archive-the-artifacts.

Example: `padv.pipeline.JenkinsOptions(EnableArtifactCollection="on_failure")`

Data Types: `logical` | `string`

`ArtifactZipFileName` — Name of ZIP file for job artifacts
`"padv_artifacts.zip"` (default) | string

Name of ZIP file for job artifacts, specified as a string.

This property specifies the file name that appears next to the `"artifacts"` for the `"archiveArtifacts"` step in the generated Jenkinsfile that defines the Jenkins pipeline.

For more information, see the Jenkins documentation for `"archiveArtifacts"`: https://www.jenkins.io/doc/pipeline/steps/core/#archiveartifacts-archive-the-artifacts.

Example: `padv.pipeline.JenkinsOptions(ArtifactZipFileName = "my_job_artifacts.zip")`

Data Types: `string`

`SaveArtifactsOnSuccess` — Setting to only archive artifacts for successful builds
`1` (`true`) (default) | `0` (`false`)

Warning This property will be removed in a future release. Use the property `EnableArtifactCollection` instead.

Setting to only archive artifacts for successful builds, specified as a numeric or logical `0` (`false`) or `1` (`true`).

Use this property to specify whether Jenkins only saves build artifacts for successful builds. This property corresponds to the argument `"onlyIfSuccessful"` for the `"artifacts"` in the `"archiveArtifacts"` step in the Jenkinsfile that defines the pipeline.

For more information, see the Jenkins documentation for `"archiveArtifacts"`: https://www.jenkins.io/doc/pipeline/steps/core/#archiveartifacts-archive-the-artifacts.

Example: `padv.pipeline.JenkinsOptions(SaveArtifactsOnSuccess = false)`

Data Types: `logical`

`GeneratedJenkinsFileName` — File name of generated Jenkins pipeline file
`"simulink_pipeline"` (default) | string

File name of generated Jenkins pipeline file, specified as a string.

By default, the generated pipeline generates into the subfolder **derived** > **pipeline**, relative to the project root. To change where the pipeline file generates, specify `GeneratedPipelineDirectory`.

Example: `padv.pipeline.JenkinsOptions(GeneratedJenkinsFileName = "padv_generated_pipeline_file")`

Data Types: `string`

`UseMatlabPlugin` — Specify whether Jenkins uses MATLAB Plugin to launch MATLAB
`1` (`true`) (default) | `0` (`false`)

Specify whether Jenkins uses MATLAB Plugin to launch MATLAB, specified as a numeric or logical `0` (`false`) or `1` (`true`).

If the property `UseMatlabPlugin` is `true`, Jenkins uses the `"runMATLABCommand"` step to launch MATLAB and the pipeline generator ignores the properties `MatlabLaunchCmd` and `MatlabStartupOptions`. For more information, see the Jenkins documentation for `"runMATLABCommand"`: https://www.jenkins.io/doc/pipeline/steps/matlab/#runmatlabcommand-run-matlab-commands-scripts-or-functions

If the property `UseMatlabPlugin` is `false`, Jenkins uses the specified `ShellEnvironment` to launch MATLAB and uses the options specified by the properties `MatlabLaunchCmd` and `MatlabStartupOptions`.

Using the MATLAB Plugin for Jenkins is recommended. For more information, see https://plugins.jenkins.io/matlab/.

Example: `padv.pipeline.JenkinsOptions(UseMatlabPlugin = false)`

Data Types: `logical`

`ShellEnvironment` — Shell environment Jenkins uses to launch MATLAB
`""` (default) | string

Shell environment Jenkins uses to launch MATLAB, specified as one of these values:

- `"bat"` — Windows® batch script
- `"sh"` — Shell script

- `"pwsh"` — PowerShell Core script
- `"powershell"` — Windows PowerShell script
- `""` — Automatically use `"bat"` or `"sh"` based on the platform where pipeline generation runs

If the property `UseMatlabPlugin` is `true`, Jenkins uses the `"runMATLABCommand"` step to launch MATLAB and the pipeline generator ignores the properties `MatlabLaunchCmd` and `MatlabStartupOptions`. For more information, see the Jenkins documentation for `"runMATLABCommand"`: https://www.jenkins.io/doc/pipeline/steps/matlab/#runmatlabcommand-run-matlab-commands-scripts-or-functions

If the property `UseMatlabPlugin` is `false`, Jenkins uses the specified `ShellEnvironment` to launch MATLAB and uses the options specified by the properties `MatlabLaunchCmd` and `MatlabStartupOptions`.

Example: `padv.pipeline.JenkinsOptions(UseMatlabPlugin = false, ShellEnvironment = "bat")`

Data Types: `string`

`RunprocessCommandOptions` — Options for `runprocess` command
`padv.pipeline.RunProcessOptions` (default) | `padv.pipeline.RunProcessOptions` object

Options for `runprocess` command, specified as a `padv.pipeline.RunProcessOptions` object. `padv.pipeline.RunProcessOptions` has properties for each name-value argument in the `runprocess` function.

For example, to have the pipeline generator use a command like `runprocess(DryRun = true)` in Jenkins, you can create a `padv.pipeline.RunProcessOptions` object, specify the property values, and pass the object to `padv.pipeline.GitLabOptions`:

```
rpo = padv.pipeline.RunProcessOptions;
rpo.DryRun = true;
jo = padv.pipeline.JenkinsOptions(RunprocessCommandOptions = rpo);
```

Example: `padv.pipeline.JenkinsOptions(RunprocessCommandOptions = padv.pipeline.RunProcessOptions)`

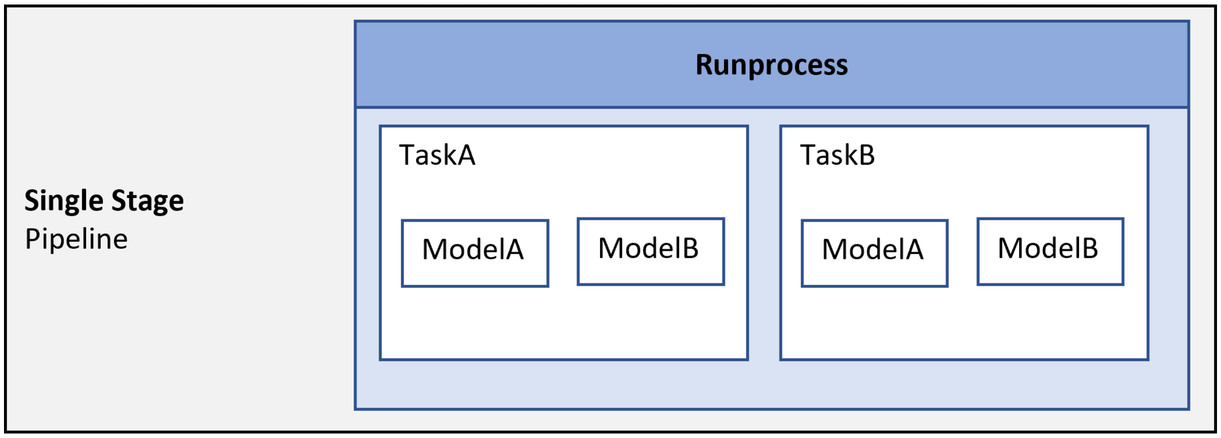
`PipelineArchitecture` — Number of stages and grouping of tasks in CI pipeline
`padv.pipeline.Architecture.SingleStage` (default) | `padv.pipeline.Architecture.SerialStages` | `padv.pipeline.Architecture.SerialStagesGroupPerTask`

Number of stages and grouping of tasks in CI pipeline, specified as either:

- `padv.pipeline.Architecture.SingleStage` — Single stage runs all tasks

  For example, a pipeline with one stage that runs each of the tasks in the process:

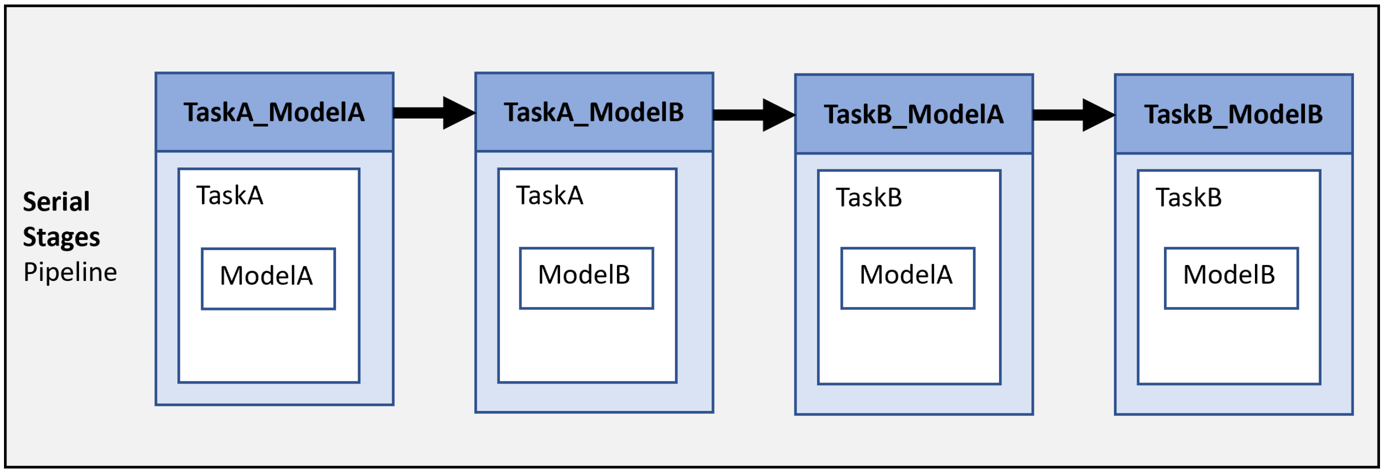
  1 **Runprocess**



- `padv.pipeline.Architecture.SerialStages` — One stage for each task iteration

  For example, a pipeline with four stages:

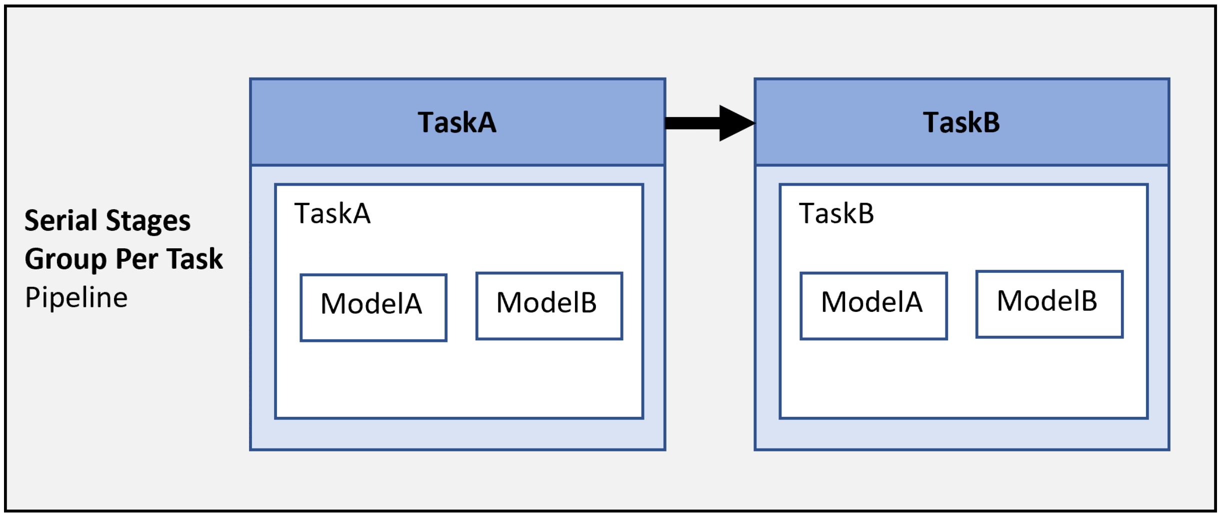
  1. **TaskA_ModelA** — Runs a task `TaskA` on the model `ModelA`
  2. **TaskA_ModelB** — Runs a task `TaskA` on the model `ModelB`
  3. **TaskB_ModelA** — Runs a task `TaskB` on the model `ModelA`
  4. **TaskB_ModelB** — Runs a task `TaskB` on the model `ModelB`



- `padv.pipeline.Architecture.SerialStagesGroupPerTask` — One stage for each type of task

  For example, a pipeline with two stages:

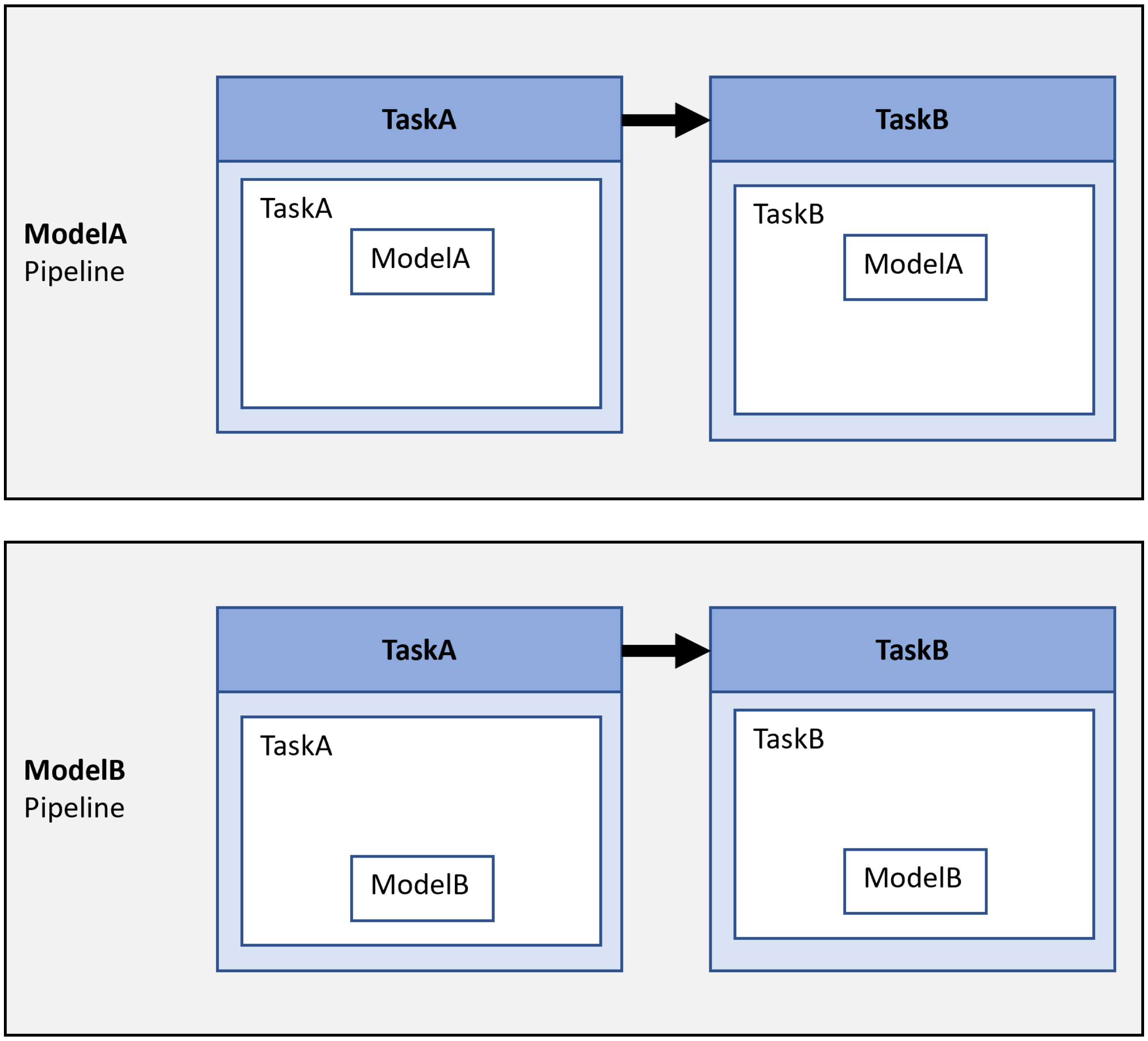
  1. **TaskA** — Runs a task `TaskA` on each model in the project
  2. **TaskB** — Runs a task `TaskB` on each model in the project



- `padv.pipeline.Architecture.IndependentModelPipelines`— Parallel, downstream pipelines for each model. Each pipeline independently runs the tasks associated with the model.

  For example, a pipeline with parallel downstream pipelines:

  - **ModelA** — Runs `TaskA` and `TaskB` on `ModelA`.
  - **ModelB** — Runs `TaskA` and `TaskB` on `ModelB`.



For more information on pipeline architectures, see the "Customize Pipeline Architecture" section in "Integrate into Jenkins" in the User's Guide PDF.

Example: `padv.pipeline.JenkinsOptions(PipelineArchitecture = padv.pipeline.Architecture.SerialStages)`

`ForceRunAllTasks` — Pipeline runs both up to date and outdated tasks
`0` (`false`) (default) | `1` (`true`)

Pipeline runs both up to date and outdated tasks, specified as a numeric or logical `1` (`true`) or `0` (`false`).

The property defines the `Force` argument for the `runprocess` function in the generated pipeline file.

Example: `padv.pipeline.JenkinsOptions(ForceRunAllTasks=true)`

Data Types: `logical`

`ExitInBatchMode` — Exits MATLAB if MATLAB was run with the `-batch` startup option
`1` (`true`) (default) | `0` (`false`)

Exits MATLAB if MATLAB was run with the `-batch` startup option, specified as a numeric or logical `0` (`false`) or `1` (`true`).

This property defines the `ExitInBatchMode` argument for the `runprocess` function in the generated pipeline file.

Example: `padv.pipeline.JenkinsOptions(ExitInBatchMode=false)`

Data Types: `logical`

`RerunFailedTasks` — Treats tasks which previously failed as being outdated
`0` (`false`) (default) | `1` (`true`)

Treats tasks which previously failed as being outdated, specified as a numeric or logical `1` (`true`) or `0` (`false`).

This property defines the `RerunFailedTasks` argument for the `runprocess` function in the generated pipeline file.

Example: `padv.pipeline.JenkinsOptions(RerunFailedTasks=true)`

Data Types: `logical`

`RerunErroredTasks` — Treats tasks which previously generated errors as outdated
`0` (`false`) (default) | `1` (`true`)

Treats tasks which previously generated errors as outdated, specified as a numeric or logical `1` (`true`) or `0` (`false`).

This property defines the `RerunErroredTasks` argument for the `runprocess` function in the generated pipeline file.

Example: `padv.pipeline.JenkinsOptions(RerunErroredTasks=true)`

Data Types: `logical`

`MatlabLaunchCmd` — Command to start MATLAB program
`"matlab"` (default) | string

Command to start MATLAB program, specified as a string.

Use this property to specify how the pipeline starts the MATLAB program. This property defines how the generated pipeline file launches MATLAB.

Example: `padv.pipeline.JenkinsOptions(MatlabLaunchCmd = "matlab")`

Data Types: `string`

`MatlabStartupOptions` — Command-line startup options for MATLAB
`"-nodesktop -logfile output.log"` (default) | string

Command-line startup options for MATLAB, specified as a string.

Use this property to specify the command-line startup options that the pipeline uses when starting the MATLAB program. This property defines the command-line startup options that appear next to the `-batch` option and `MatlabLaunchCmd` value in the`"script"` section of the generated pipeline file. The pipeline starts MATLAB with the specified startup options.

By default, the support package launches MATLAB using the `-batch` option. If you need to run MATLAB without the `-batch` option, specify the property `AddBatchStartupOption` as false.

Note If you run MATLAB using the `-nodisplay` option, you should set up a virtual display server before you include the following built-in tasks in your process model:

- **Generate SDD Report**
- **Generate Simulink Web View**
- **Generate Model Comparison**

For information, see "Set Up Virtual Display for No-Display Machine" in the User's Guide.

Example: `padv.pipeline.JenkinsOptions(MatlabStartupOptions = "-nodesktop -logfile mylogfile.log")`

Data Types: `string`

`AddBatchStartupOption` — Specify whether to open MATLAB using `-batch` startup option
`1` (`true`) (default) | `0` (`false`)

Specify whether to open MATLAB using `-batch` startup option, specified as a numeric or logical `0` (`false`) or `1` (`true`).

By default, the support package launches MATLAB in CI using the `-batch` startup option.

If you need to launch MATLAB with options that are not compatible with `-batch`, specify `AddBatchStartupOption` as `false`.

Example: `padv.pipeline.JenkinsOptions(AddBatchStartupOption = false)`

Data Types: `logical`

`GeneratedPipelineDirectory` — Specify where the generated pipeline file generates
`fullfile("derived","pipeline")` (default) | string

Specify where the generated pipeline file generates, specified as a string.

This property defines the directory where the generated pipeline file generates.

By default, the generated pipeline file is named `"simulink_pipeline"`. To change the name of the generated pipeline file, specify `GeneratedJenkinsFileName`.

Example: `padv.pipeline.JenkinsOptions(GeneratedPipelineDirectory = fullfile("derived","pipeline","test"))`

Data Types: `string`

`GenerateJUnitForProcess` — Generate JUnit-style XML reports for process
`true` or `1` (default) | `false` or `0`

Generate JUnit-style XML reports for each task in the process, specified as a numeric or logical `1` (`true`) or `0` (`false`).

JUnit reports allow you see which tests failed in CI without having to examine the job logs.

If you generate JUnit reports, Jenkins can show test failures and trends directly in the user interface. For more information on how Jenkins displays JUnit results, see the Jenkins documentation: https://plugins.jenkins.io/junit/.

Note You must have the JUnit plugin installed on your Jenkins controller to see JUnit results. For information, see https://plugins.jenkins.io/junit/.

Example: `padv.pipeline.JenkinsOptions(GenerateJUnitForProcess = false)`

Data Types: `logical`

`GenerateReport` — Generate Process Advisor build report
`true` or `1` (default) | `false` or `0`

Generate Process Advisor build report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `padv.pipeline.JenkinsOptions(GenerateReport = false)`

Data Types: `logical`

`ReportFormat` — File format for generated report
`"pdf"` (default) | `"html"` | `"html-file"` | `"docx"`

File format for the generated report, specified as one of these values:

- `"pdf"` — PDF file
- `"html"` — HTML report, packaged as a zipped file that contains the HTML file, images, style sheet, and JavaScript files of the report
- `"html-file"` — HTML report
- `"docx"` — Microsoft Word document

Example: `padv.pipeline.JenkinsOptions(ReportFormat = "html-file")`

`ReportPath` — Name and path of generated report
`"$PROJECTROOT$/ProcessAdvisorReport"` (default) | string array

Name and path of generated report, specified as a string array.

By default, the report path uses a relative path to the project root and the pipeline generator generates a report `ProcessAdvisorReport.pdf`.

Example: `padv.pipeline.JenkinsOptions(ReportFormat = "myReport")`

Data Types: `string`

`StopOnStageFailure` — Stop running pipeline after stage fails
`0` (`false`) (default) | `1` (`true`)

Stop running pipeline after stage fails, specified as a numeric or logical `0` (`false`) or `1` (`true`).

By default, the pipeline continues to run, even if a stage in the pipeline fails.

Example: `padv.pipeline.JenkinsOptions(StopOnStageFailure = true)`

Data Types: `logical`

`CheckOutdatedResultsAfterMerge` — Check for outdated results after merge
`1` (`true`) (default) | `0` (`false`)

Check for outdated results after merge, specified as a numeric or logical `1` (`true`) or `0` (`false`).

When specified as `true`, the pipeline checks if task results are still up-to-date after merging artifact database files from parallel jobs. Outdated results are not expected if the merge is successful. When there are outdated results, there could be an issue with the merge.

Example: `false`

Data Types: `logical`

Examples

Specify Jenkins Configuration Options When Generating Pipeline Configuration File

Create a `padv.pipeline.JenkinsOptions` object and change the options. When you generate a pipeline configuration file, the file uses the specified options.

This example shows how to use the pipeline generator API. For information on how to use the pipeline generator to integrate into a Jenkins CI system, see "Integrate into Jenkins" in the User's Guide PDF.

Load a project. For this example, you can load a Process Advisor example project. In the MATLAB Command Window, enter:

```
processAdvisorExampleStart
```

Create a `padv.pipeline.JenkinsOptions` object for generating a Jenkins pipeline configuration file. Specify a Jenkins agent label of `high_memory`, specify that the function `runprocess` should not automatically exit MATLAB after the pipeline finishes running, and a single stage pipeline architecture.

```
JenkinsOptions = padv.pipeline.JenkinsOptions(...
AgentLabel = "high_memory",...
ExitInBatchMode = 0,...
PipelineArchitecture = padv.pipeline.Architecture.SingleStage);
```

Generate a Jenkins pipeline configuration file by using the function `padv.pipeline.generatePipeline` with the specified options.

```
padv.pipeline.generatePipeline(JenkinsOptions);
```

Note Calling `padv.pipeline.generatePipeline(JenkinsOptions)` is equivalent to calling `padv.pipeline.generateJenkinsPipeline(JenkinsOptions)`.

By default, the generated pipeline file is named `simulink_pipeline` and is saved in the **derived** > **pipeline** folder, relative to the project root. To change the name of the generated pipeline file, specify the argument `GeneratedJenkinsFileName` for `padv.pipeline.JenkinsOptions`. To change where the pipeline file generates, specify the argument `GeneratedPipelineDirectory`.

For information on how to use the pipeline generator to integrate into a Jenkins CI system, see "Integrate into Jenkins" in the User's Guide.

See Also

`padv.pipeline.generatePipeline`

Topics

"Integrate into Jenkins"

Report Generator API

After you run your tasks, you can use the report generator to create a report with the most recent task results. The report summarizes the task statuses, task results, and other information about the task execution.

For example, if you run the tasks in the default MBD pipeline, the report provides an overview of the:

- Model Advisor analysis, including the number of passing, warning, and failing checks
- Test results, organized by iteration
- Generated code files
- Coding standards checks

For an example, see "Prequalify Changes Before Submitting to Source Control" in the User's Guide PDF.

Classes

Class	Description
`padv.ProcessAdvisorReportGenerator`	Settings for generating Process Advisor report

Functions

Function	Description
`generateReport`	Generate report with recent task results

padv.ProcessAdvisorReportGenerator Class

Namespace: `padv`
Superclasses: `mlreportgen.report.Report`

Settings for generating Process Advisor report

Description

Use the `padv.ProcessAdvisorReportGenerator` class to represent the settings for generating a Process Advisor report. After you run tasks using the Process Advisor app or `runprocess` function, you can call the `generateReport` function on a `padv.ProcessAdvisorReportGenerator` object to generate a report of the task results.

The `padv.ProcessAdvisorReportGenerator` class is a `handle` class.

Creation

Syntax

```
padv.ProcessAdvisorReportGenerator
padv.ProcessAdvisorReportGenerator(Name=Value)
```

Description

`padv.ProcessAdvisorReportGenerator` returns settings for generating a Process Advisor report.

`padv.ProcessAdvisorReportGenerator(Name=Value)` sets properties using one or more name-value arguments. For example, `padv.ProcessAdvisorReportGenerator(Format="html-file")` creates a report settings object that specifies for the generated Process Advisor report to be an HTML file.

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `padv.ProcessAdvisorReportGenerator(Format="html-file")`

`Format` — File format for generated report
`"pdf"` (default) | `"html"` | `"html-file"` | `"docx"`

File format for the generated report, specified as one of these values:

- `"pdf"` — PDF file
- `"html"` — HTML report, packaged as a zipped file that contains the HTML file, images, style sheet, and JavaScript files of the report

- `"html-file"` — HTML report
- `"docx"` — Microsoft Word document

This argument specifies the `Type` property for the `padv.ProcessAdvisorReportGenerator` object.

Example: `"html-file"`

`OutputPath` — Name and path of generated report
`"$PROJECTROOT$/ProcessAdvisorReport"` (default) | string

Name and path of generated report, specified as a string.

By default, the report path uses a relative path to the project root and the pipeline generator generates a report `ProcessAdvisorReport.pdf`.

Example: `"tools/myReport"`

Data Types: `string`

`Process` — Name of process that you want to generate report for
`padv.ProcessModel.DefaultProcessId` (default) | string

Name of process that you want to generate report for, specified by a character vector or string.

By default, the report generator generates a report for the default process. But if there are multiple processes defined inside your process model, you can generate a report for a different process by using the `Process` argument.

Example: `"CIPipeline"`

Example: `"Fail-Fast"`

Data Types: `string`

See Also
`generateReport` | `mlreportgen.report.Report`

generateReport

Generate report with recent task results

Syntax

```
generateReport(reportSettings)
```

Description

`generateReport(reportSettings)` generates a report with the most recent task results.

After you run tasks using the Process Advisor app or `runprocess` function, you can call the `generateReport` function on a `padv.ProcessAdvisorReportGenerator` object to generate a report of the task results.

Alternatively, you can use `runprocess` with the `GenerateReport` name-value argument specified as `true`: `runprocess(GenerateReport = true)`.

Examples

Generate Report with Task Results

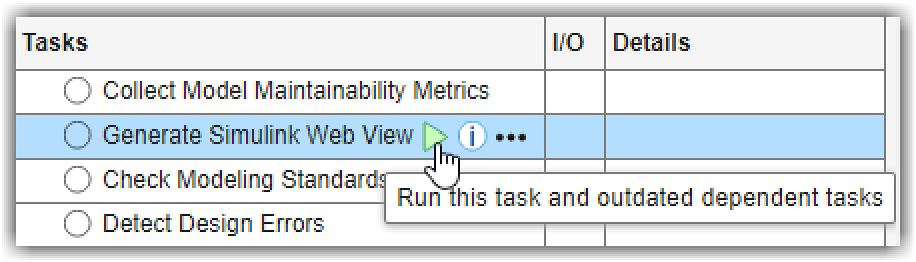
Run a task and generate a report with the task results.

Open the Process Advisor example project.

```
processAdvisorExampleStart
```

This command creates a copy of the Process Advisor example project and opens Process Advisor on the model `AHRS_Voter`.

Run a task. For this example, in Process Advisor, point to the task **Generate Simulink Web View** and click the run button ▷.


Tasks
I/O
Details
Collect Model Maintainability Metrics
Generate Simulink Web View
Check Modeling Standards
Detect Design Errors
Run this task and outdated dependent tasks

Use the `generateReport` function to generate an HTML report with the task results.

```
generateReport(padv.ProcessAdvisorReportGenerator(Format="html-file"))
```

The report, `ProcessAdvisorReport.html`, generates in the current working folder.

Open and inspect the report. The report shows a summary of the task status, results, inputs, and outputs.

Input Arguments

`reportSettings` — Report generation settings
`padv.ProcessAdvisorReportGenerator` object

Report generation settings, specified as a `padv.ProcessAdvisorReportGenerator` object.

Example: `padv.ProcessAdvisorReportGenerator`

Example: `padv.ProcessAdvisorReportGenerator(Format="html-file")`

Tips

- If you want to run tasks and generate a report in batch mode, you need to specify the `runprocess` argument `ExitInBatchMode` as `false` and use the `exitCode` returned by `runprocess` to exit:

  ```
  [buildResult, exitCode] = runprocess(ExitInBatchMode=false);
  rptObj = padv.ProcessAdvisorReportGenerator();
  generateReport(rptObj);
  exit(exitCode);
  ```

  Otherwise, the function `runprocess` automatically exits MATLAB before the report can generate.

Alternative Functionality

Alternatively, you can use `runprocess` with the `GenerateReport` name-value argument specified as `true`: `runprocess(GenerateReport = true)`.

See Also

`padv.ProcessAdvisorReportGenerator`

Utilities

Classes

Specify Artifact Address for padv.Artifact Object

Class	Description
`padv.util.ArtifactAddress`	Address for artifact in project

Functions

Close Models Loaded by Task

Function	Description
`padv.util.closeModelsLoadedByTask`	Close models loaded by task

Get Current Project and Referenced Projects

Function	Description
`padv.util.getCurrentProject`	Get current project and persist project instance **Note** This function can be faster than the `currentProject` function because it creates a persistent variable for the current project instance.
`padv.util.getProjectReferences`	Get list of project references

Get Information From Artifact

Function	Description
`padv.util.getModelName`	Find name of model that contains artifact
`padv.util.getTestCaseID`	Find ID for test case that contains artifact

If your team generates code in parallel by generating an external code cache (see `GenerateExternalCodeCache` property for built-in task `padv.builtin.task.GenerateCode`), downstream tasks that depend on the generated code need to unpack the generated code target before running the task action. Built-in tasks like `padv.builtin.task.AnalyzeModelCode` unpack by using the utility function `padv.util.unpackExternalCodeCache`.

Reanalyze Project From Scratch

Function	Description
`padv.util.forceReanalyzeProject`	Reanalyze project and log analysis events **Note** You should only use the function `padv.util.forceReanalyzeProject` if there are unexpected project analysis issues. For general task and result cleanup, use `runprocess` instead.

Refresh Process Model

Function	Description
`padv.util.refreshProcessModel`	Refresh process model data

Save and Merge Artifact Database Files

Function	Description
`padv.util.mergeArtifactDatabases`	Merge artifact database files
`padv.util.saveArtifactDatabase`	Save copy of artifact database file

Unpack Generated Code Target

Function	Description
`padv.util.unpackExternalCodeCache`	Unpack code generation target from Simulink cache files

Process Advisor and the build system are able to detect changes to project files and identify outdated tasks by using the information in the artifact database file, located in `derived > artifacts.dmr`.

When your team works on multiple machines or runs tasks in parallel, you generate different versions of artifact database file. To create an artifact database file that includes the latest changes, you can save a base artifact database file and merge artifact database files by using the functions `padv.util.saveArtifactDatabase` and `padv.util.mergeArtifactDatabases`.

padv.util.ArtifactAddress

Address for artifact in project

Description

Use the `padv.util.ArtifactAddress` object to represent the address of an artifact in your project.

Creation

Syntax

```
addressObj = padv.util.ArtifactAddress(filePath)
addressObj = padv.util.ArtifactAddress( ___ ,Name=Value)
```

Description

`addressObj = padv.util.ArtifactAddress(filePath)` creates an artifact address by using the file path specified by `filePath`. You can access information inside the artifact address object by using the object functions listed below.

`addressObj = padv.util.ArtifactAddress( ___ ,Name=Value)` creates an artifact address using the settings specified by one or more name-value arguments. For example, to create an artifact address that specifies the name of the project that contains the artifact, specify `OwningProjectName=`*`projectName`*.

Input Arguments

`filePath` — File path
string array

File path, specified as a string array.

Example: `padv.util.ArtifactAddress(fullfile("tools","sampleChecks.json"))`

Data Types: `string`

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `padv.util.ArtifactAddress(filePath,OwningProjectName=projectName)`

`OwningProjectName` — Project that contains artifact
string array

Project that contains the artifact, specified as a string array.

You can retrieve the owning project name of an artifact address object by using the `getOwningProject` object function.

Example: `"ProcessAdvisorExample"`

Data Types: `string`

`Track` — Setting for tracking changes to artifact
`true` or `1` | `false` or `0`

Setting for tracking changes to the artifact, specified as a numeric or logical `1` (`true`) or `0` (`false`).

For more information, see "Turn Off Change Tracking for Input Artifacts" in the User's Guide PDF.

Example: `false`

Data Types: `logical`

Object Functions

Function	Description
`getFileAddress`	Get address of file on disk. `getFileAddress(addressObj)`
`getKey`	Get unique address of artifact. `getKey(addressObj)`
`getOwningProject`	Get name of project that contains the artifact. `getOwningProject(addressObj)`
`getAbsolutePath`	Get the absolute path of the artifact. `getAbsolutePath(addressObj)`
`isFileArtifact`	Determine if input is file. `isFileArtifact(addressObj)`
`isSubFileArtifact`	Determine if input is subfile. A subfile is a part of a larger file. For example, a subsystem is a subfile of a model file. `isSubFileArtifact(addressObj)`

Examples

Specify Address for Artifact

Create artifact address for file in project.

```
addressObj = padv.util.ArtifactAddress(...
fullfile("tools","sampleChecks.json"));
```

Use artifact address to create `padv.Artifact` object.

```
paArtifact = padv.Artifact("other_file",addressObj)
```

Specify Which Project Contains Artifact

Specify the name of the project that contains the artifact.

```
projectName = "My Reference Project";
```

Specify that the project contains the artifact.

```
addressObj = padv.util.ArtifactAddress(...
fullfile("tools","sampleChecks.json"),...
OwningProjectName=projectName)
```

You can view which project contains the artifact by using the `getOwningProject` function.

```
getOwningProject(addressObj)
```

```
ans = 

    "My Reference Project"
```

padv.util.closeModelsLoadedByTask

Close models loaded by task

Syntax

```
padv.util.closeModelsLoadedByTask(PreviouslyLoadedModels = modelList)
```

Description

`padv.util.closeModelsLoadedByTask(PreviouslyLoadedModels = modelList)` closes models that were loaded by the current task. The function determines which models the task loaded by comparing the current list of loaded models to a list of previously loaded models, `modelList`. The function uses `close_system(model,0)` to close the models without saving.

Use this function inside the `run` function of a custom task to close models loaded by the task. Note that the function does not close models that are open in the Simulink Editor.

Examples

Close Models Loaded by Task

Find which models were already loaded and then use the function `padv.util.closeModelsLoadedByTask` to close only models loaded by the current task.

Inside the `run` function for your custom task, use the function `get_param` to find and save a list of the previously loaded models. Then, after your task performs its action and specifies the task results, close the models loaded by the task. For example, the `run` function in your custom task might look like:

```
function taskResult=run(obj, input)
    % Before the task loads models, save a list of the models that are already loaded.
    loadedModels = get_param(Simulink.allBlockDiagrams(), 'Name');

    % <load models for this task>
    % <specify task results>

    % Close models that were loaded by this task.
    padv.util.closeModelsLoadedByTask(PreviouslyLoadedModels=loadedModels);
end
```

Input Arguments

`modelList` — List of previously loaded models

List of previously loaded models, specified as an array of model names.

You can use the function `get_param` to find the currently loaded models:

```
loadedModels = get_param(Simulink.allBlockDiagrams(), 'Name');
```

Example: `{'modelA';'modelB';'modelC'}`

padv.util.forceReanalyzeProject

Reanalyze project and log analysis events

Syntax

`padv.util.forceReanalyzeProject()`

Description

`padv.util.forceReanalyzeProject()` forces a reanalysis of the current project by creating backups of the existing artifact database (`artifacts.dmr`), clearing the existing project analysis, and reanalyzing the project. The function also logs project analysis events, which can help with troubleshooting persistent project analysis issues. Note that when you run the function, the function closes and reopens the project.

The function creates backup files and detailed logs in the `derived` folder in the project and creates a ZIP file containing these artifacts for further analysis. The files include:

- `artifacts_no_update.dmr.bak` — Backup of the `artifacts.dmr` file before update
- `artifacts_update.dmr.bak` — Backup of the `artifacts.dmr` file after update
- `artifacts_new.dmr.bak` — Backup of the `artifacts.dmr` file after reanalysis
- `dt_Event_Log.txt` — Event log file
- `detailed_logs.txt` — Detailed log file
- `logs.zip` — ZIP file containing the above files

Note You should only use the function `padv.util.forceReanalyzeProject` when there are unexpected project analysis issues. When you clear the existing project analysis file, you might permanently lose important information, including the UUIDs that the digital thread assigned to artifacts in your project. Reanalyzing a project might take some time to complete. The `artifacts.dmr` file might be used by other project users and if you use other tools that use the digital thread, you might need to re-run the metrics in those tools.

For general task and result cleanup, use `runprocess` instead. The `runprocess` function has name-value arguments, `Clean` and `DeleteOutputs`, that you can use to clean task results and delete task outputs. For information, see `runprocess`.

padv.util.getCurrentProject

Get current project and persist project instance

Syntax

`cp = padv.util.getCurrentProject()`

Description

`cp = padv.util.getCurrentProject()` gets the currently open project, and returns a project object, `cp`. You can use this function to get the current project in your code, for example, in custom queries. This function can be faster than the `currentProject` function because `cp` is a persistent variable.

Examples

Get Current Project

Get the current project, represented by a `matlab.project.Project` object.

Open the Process Advisor example project.

```
processAdvisorExampleStart
```

Get the current project.

```
cp = padv.util.getCurrentProject()
```

Output Arguments

cp — Current project
`matlab.project.Project`

Current project, returned as a `matlab.project.Project` object. `cp` is a persistent variable that can remain in memory between calls to the function.

If you do not have a project open, then the function returns an empty array.

padv.util.getModelName

Namespace: `padv.util`

Find name of model that contains artifact

Syntax

`modelName = padv.util.getModelName(artifact)`

Description

`modelName = padv.util.getModelName(artifact)` returns the name of the model that contains `artifact`.

Input Arguments

`artifact` — Artifact information
`padv.Artifact` object

Artifact information, specified as a `padv.Artifact` object.

You can create a `padv.Artifact` object either by:

- Running a built-in query. When you run a built-in query, the query returns either a `padv.Artifact` object or an array of `padv.Artifact` objects.
- Using the `padv.Artifact` class.

Example:
```
padv.Artifact("sl_model_file",padv.util.ArtifactAddress(fullfile("02_Models",
"AHRS_Voter","specification","AHRS_Voter.slx")))
```

Output Arguments

`modelName` — Name of model that contains artifact
string

Name of model that contains artifact, returned as a string.

padv.util.getProjectReferences

Get list of project references

Syntax

```
prjReferences = padv.util.getProjectReferences()
prjReferences = padv.util.getProjectReferences("reset")
```

Description

`prjReferences = padv.util.getProjectReferences()` gets a list of the project references for the current project. The function caches the list.

`prjReferences = padv.util.getProjectReferences("reset")` resets the cached list of project references.

Examples

Get List of Project References

Get a list of the project references for the current project.

Open the Process Advisor example for project references.

```
processAdvisorProjectReferenceExampleStart
```

Get the list of project references for the current project.

```
prjReferences = padv.util.getProjectReferences()
```

Output Arguments

`prjReferences` — Project references
`ProjectReference` object | array of `ProjectReference` objects

Project references, returned as a `ProjectReference` object or an array of `ProjectReference` objects.

padv.util.getTestCaseID

Find ID for test case that contains artifact

Syntax

`testCaseID = padv.util.getTestCaseID(artifact)`

Description

`testCaseID = padv.util.getTestCaseID(artifact)` returns the ID for the test case that contains `artifact`.

Examples

Find Test Case ID Associated with Artifact

Find the test case ID for a test case by using `padv.util.getTestCaseID`.

Open the Process Advisor example project. In the MATLAB Command Window, enter:

```
processAdvisorExampleStart
```

Create a query that can find the test cases in the project. Since test cases are part of a larger test file, test cases are subfile artifacts and you must specify `FilterSubFileArtifacts` as `false` to stop the query from filtering out the test cases.

```
q = padv.builtin.query.FindArtifacts(ArtifactType = "sl_test_case",...
FilterSubFileArtifacts = false);
```

Find the test cases in the project by running the query. The query returns the as an array of `padv.Artifact` objects.

```
testCaseArtifacts = run(q);
```

Find the test case ID for one of the test cases returned by the query.

```
id = padv.util.getTestCaseID(testCaseArtifacts(1))
```

Input Arguments

`artifact` — Artifact information
`padv.Artifact` object

Artifact information, specified as a `padv.Artifact` object.

You can create a `padv.Artifact` object either by:

- Running a built-in query. When you run a built-in query, the query returns either a `padv.Artifact` object or an array of `padv.Artifact` objects.

- Using the `padv.Artifact` class.

  Example:
  ```
  padv.Artifact("sl_model_file",padv.util.ArtifactAddress(fullfile("02_Models",
  "AHRS_Voter","specification","AHRS_Voter.slx")))
  ```

Output Arguments

`testCaseID` — ID for test case that contains artifact
string

ID for the test case that contains the artifact, returned as a string.

padv.util.mergeArtifactDatabases

Merge artifact database files

Syntax

```
padv.util.mergeArtifactDatabases(Base = baseFile, Branches = filesToMerge,
Merged = mergedFile)
padv.util.mergeArtifactDatabases( ___ ,CheckOutdatedResults = false)
```

Description

`padv.util.mergeArtifactDatabases(Base = baseFile, Branches = filesToMerge, Merged = mergedFile)` merges the artifact database files, `filesToMerge`, with the common ancestor artifact database file, `baseFile`, to create a merged artifact database file `mergedFile`.

You can use this function to merge artifact database files from different feature branches or CI pipeline jobs. The function requires an open project.

`padv.util.mergeArtifactDatabases( ___ ,CheckOutdatedResults = false)` merges without validating that task results are still up-to-date after the merge. Outdated results are not expected if the merge is successful. When there are outdated results, there could be an issue with the merge. By default, `CheckOutdatedResults` is `true`.

Note Only supported in R2023b Update 5 and later releases.

Examples

Merge Project Analysis from Different Feature Branches

Process Advisor and the build system are able to detect changes to project files and identify outdated tasks by using the information in the artifact database file `artifacts.dmr`. When your team works on a project with multiple feature branches, you might need to merge different versions of `artifacts.dmr` into a single file that contains the latest project analysis. To create the file, you need to save a copy of the base artifact database file and then merge the `artifacts.dmr` files from each branch.

When your team members clone the project from source control, have them download the latest derived files, including the `artifacts.dmr` file that contains the latest analysis of the project. By default, digital thread stores the artifact database file inside the `derived` folder in the project root.

You can use a database or repository management tool to handle derived files effectively.

To resolve conflicts between the artifact database files from the different feature branches, you need to create a base artifact database file. Use the most recent `artifacts.dmr` file from the derived files as the base because that file represents the latest shared state of project analysis across the feature branches.

Create a copy of the artifact database file inside the `derived` folder and name the file `base.dmr`.

```
padv.util.saveArtifactDatabase(fullfile("derived","base.dmr"))
```

As each team member works on their separate branches, the digital thread updates the `artifacts.dmr` file in their copy of the project to reflect their changes.

After a team member makes the changes on their branch, use the function `padv.util.saveArtifactDatabase` in each branch to save a copy of the artifact database file from that branch. For example, you might have artifact database files like `featureA.dmr` and `featureB.dmr`.

Merge the artifact database files into a new `artifacts.dmr` file by using the function `padv.util.mergeArtifactDatabases`. The base artifact database file is `base.dmr` and the artifact database files from the branches are `featureA.dmr` and `featureB.dmr`.

```
padv.util.mergeArtifactDatabases(...
Base = fullfile("derived","base.dmr"),...
Branches = [fullfile("derived","featureA.dmr"), fullfile("derived","featureB.dmr")],...
Merged = fullfile("derived","artifacts.dmr"))
```

This section describes how to merge artifact database files from separate feature branches, but you can also use these functions to merge artifact database files from jobs in CI and tasks that you run in parallel. Starting in R2023b Update 5, GitHub and Jenkins pipelines that you generate by using the function `padv.pipeline.generatePipeline` automatically merge artifact database files.

Input Arguments

`baseFile` — Path and name of base artifact database file

string

Path and name of base artifact database file, specified as a string.

The base artifact database file is the common ancestor of the artifact database files that you want to merge. The path must be relative to the project root or an absolute path.

To create a common ancestor, you can save a copy of an artifact database file by using the function `padv.util.saveArtifactDatabase`.

Example: `fullfile("derived", "base.dmr")`

Data Types: `string`

`filesToMerge` — Paths and names of artifact database files to merge

string array

Paths and names of artifact database files that you want to merge, specified as a string array.

Example: `[fullfile("derived", "modelA.dmr"), fullfile("derived", "modelB.dmr")]`

Data Types: `string`

`mergedFile` — Path and name of merged artifact database file

string

Path and name of merged artifact database file, specified as a string.

The path must be relative to the project root or an absolute path.

Example: `fullfile("derived", "artifacts.dmr")`

Data Types: `string`

Version History

Introduced in R2023b

padv.util.refreshProcessModel

Refresh process model data

Syntax

```
padv.util.refreshProcessModel()
```

Description

`padv.util.refreshProcessModel()` refreshes the process model. Use this function if you need to manually refresh the process model data.

Examples

Refresh Process Model

Make a change to a project and programmatically refresh the process model data.

Open the example project for Process Advisor.

```
processAdvisorExampleStart
```

The `AHRS_Voter` model opens.

Make a change to the `AHRS_Voter` model and re-save the model.

The warning banner in Process Advisor shows that the process model data needs to be refreshed.

Programmatically refresh the process model data by using `padv.util.refreshProcessModel`.

```
padv.util.refreshProcessModel
```

padv.util.saveArtifactDatabase

Save copy of artifact database file

Syntax

```
padv.util.saveArtifactDatabase(destination)
```

Description

`padv.util.saveArtifactDatabase(destination)` saves a copy of the artifact database file in the destination specified by `destination`.

The artifact database file, `artifacts.dmr`, is saved in the `derived` folder in the project root. This file tracks the project artifacts and their dependencies. Manually copying this file can lead to inconsistencies or incorrect behavior due to pending artifact changes.

You can use this function to create base artifact database files and save copies of artifact database files from different feature branches or CI pipeline jobs.

The function requires an open project and requires CI/CD Automation for Simulink Check.

Note Only supported in R2023b Update 5 and later releases.

Examples

Merge Project Analysis from Different Feature Branches

Process Advisor and the build system are able to detect changes to project files and identify outdated tasks by using the information in the artifact database file `artifacts.dmr`. When your team works on a project with multiple feature branches, you might need to merge different versions of `artifacts.dmr` into a single file that contains the latest project analysis. To create the file, you need to save a copy of the base artifact database file and then merge the `artifacts.dmr` files from each branch.

When your team members clone the project from source control, have them download the latest derived files, including the `artifacts.dmr` file that contains the latest analysis of the project. By default, digital thread stores the artifact database file inside the `derived` folder in the project root.

You can use a database or repository management tool to handle derived files effectively.

To resolve conflicts between the artifact database files from the different feature branches, you need to create a base artifact database file. Use the most recent `artifacts.dmr` file from the derived files as the base because that file represents the latest shared state of project analysis across the feature branches.

Create a copy of the artifact database file inside the `derived` folder and name the file `base.dmr`.

```
padv.util.saveArtifactDatabase(fullfile("derived","base.dmr"))
```

As each team member works on their separate branches, the digital thread updates the `artifacts.dmr` file in their copy of the project to reflect their changes.

After a team member makes the changes on their branch, use the function `padv.util.saveArtifactDatabase` in each branch to save a copy of the artifact database file from that branch. For example, you might have artifact database files like `featureA.dmr` and `featureB.dmr`.

Merge the artifact database files into a new `artifacts.dmr` file by using the function `padv.util.mergeArtifactDatabases`. The base artifact database file is `base.dmr` and the artifact database files from the branches are `featureA.dmr` and `featureB.dmr`.

```
padv.util.mergeArtifactDatabases(...
Base = fullfile("derived","base.dmr"),...
Branches = [fullfile("derived","featureA.dmr"), fullfile("derived","featureB.dmr")],...
Merged = fullfile("derived","artifacts.dmr"))
```

This section describes how to merge artifact database files from separate feature branches, but you can also use these functions to merge artifact database files from jobs in CI and tasks that you run in parallel. Starting in R2023b Update 5, GitHub and Jenkins pipelines that you generate by using the function `padv.pipeline.generatePipeline` automatically merge artifact database files.

Input Arguments

`destination` — File destination

string

File destination for copied artifact database file, specified as a string.

The path must be relative to the project root or an absolute path and must include the `.dmr` extension.

Example: `fullfile("derived", "base.dmr")`

Data Types: `string`

Version History

Introduced in R2023b

padv.util.unpackExternalCodeCache

Unpack code generation target from Simulink cache files

Syntax

```
padv.util.unpackExternalCodeCache(cacheFiles)
```

Description

`padv.util.unpackExternalCodeCache(cacheFiles)` unpacks the code generation target from the Simulink cache files, `cacheFiles`.

An external code cache allows your team to generate code in parallel while maintaining up-to-date task results. For information on parallel code generation, see the property GenerateExternalCodeCache for the built-in task `padv.builtin.task.GenerateCode`.

If your team generates code in parallel by generating an external code cache, downstream tasks that depend on the generated code need to unpack the generated code target before running the task action. Built-in tasks that depend on generated code, like `padv.builtin.task.AnalyzeModelCode`, unpack the code generation target by using the utility function `padv.util.unpackExternalCodeCache`.

Examples

Unpack Code Generation Target

Generate and unpack code generation target.

Open the parallel code generation example.

```
processAdvisorParallelExampleStart
```

Generate code by running a code generation task iteration. For example, run the code generation task on the reference model `OuterLoop_Control`.

```
runprocess(Tasks = "padv.builtin.task.GenerateCode", ...
    FilterArtifact = fullfile("02_Models","OuterLoop_Control", ...
    "specification","OuterLoop_Control.slx"));
```

Find the external code cache file by using the built-in query.

```
q = padv.builtin.query.FindExternalCodeCache;
artifactsArray = run(q);
```

Unpack the cache file.

```
padv.util.unpackExternalCodeCache(artifactsArray);
```

Input Arguments

`cacheFiles` — Address for external code cache files
array of `padv.Artifact` objects | cell array of character vectors | string array

Absolute or relative address for external code cache files, specified as either an array of `padv.Artifact` objects, a cell array of character vectors, or a string array.

The built-in code generation task, `padv.builtin.task.GenerateCode`, generates these cache files when you specify the task property `GenerateExternalCodeCache` as `true`.

The files must be:

- `.slxc.bk` files
- compatible with the `slxcunpack` function
- inside the project root folder

Process Advisor Example Projects

The support package includes example projects that you can use to try the Process Advisor app and build system. If you use GitHub, GitLab, or Jenkins, you can use the examples for those specific CI platforms to see example pipeline configuration files and example Dockerfiles.

Example projects:

- `processAdvisorExampleStart`
- `processAdvisorGitHubExampleStart`
- `processAdvisorGitLabExampleStart`
- `processAdvisorJenkinsExampleStart`
- `processAdvisorProjectReferenceExampleStart`

processAdvisorExampleStart

Set up Process Advisor example project

Syntax

```
processAdvisorExampleStart
processAdvisorExampleStart(Name=Value)
```

Description

`processAdvisorExampleStart` sets up a Process Advisor example project. The function creates a new copy of the Process Advisor example project and automatically opens the Process Advisor app on the model `AHRS_Voter`.

`processAdvisorExampleStart(Name=Value)` sets up a Process Advisor example project using the specified options.

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `processAdvisorExampleStart(ProjectFolder = "exampleProject")`

`CI` — Add pipeline configuration file for specific CI platform
`""` (default) | `"github"` | `"gitlab"` | `"jenkins"`

Add pipeline configuration file for a specific CI platform, specified as:

- `"github"` — for GitHub
- `"gitlab"` — for GitLab (same as calling `processAdvisorGitLabExampleStart`)
- `"jenkins"` — for Jenkins (same as calling `processAdvisorJenkinsExampleStart`)

By default, the function does not add pipeline configuration files to the example project.

To configure the pipeline configuration file to use automatic pipeline generation, use the argument `PipelineGen`.

Example: `processAdvisorExampleStart(CI="jenkins")`

Data Types: `string`

`PipelineGen` — Configure pipeline configuration file to use automatic pipeline generation
`true` or `1` (default) | `false` or `0`

Configure the pipeline configuration file to use automatic pipeline generation, specified as a numeric or logical `0` (`false`) or `1` (`true`).

Example: `processAdvisorExampleStart(CI = "github", PipelineGen = false)`

Data Types: `logical`

`IncludeDockerFile` — Add example Dockerfile to project
`true` or `1` (default) | `false` or `0`

Add an example Dockerfile to the project, specified as a numeric or logical `0` (`false`) or `1` (`true`).

By default, the function adds an example Dockerfile named `Dockerfile` to the project root. You can use the example Dockerfile to create a Docker image that includes MATLAB, other MathWorks® products, and the CI/CD Automation for Simulink Check support package.

For more information on Dockerfiles, see "Create Docker Container for Support Package" in the User's Guide PDF.

Example: `processAdvisorExampleStart(IncludeDockerFile = false)`

Data Types: `logical`

`ProjectFolder` — Folder to download project into
`""` (default) | string

Folder to download project into, specified as a string.

By default, the function does not create a parent folder for the project.

Example: `processAdvisorExampleStart(ProjectFolder = "exampleProject")`

Data Types: `string`

`Subprocess` — Set up example project to group model verification and code verification tasks using subprocesses
`false` or `0` (default) | `true` or `1`

Set up example project to group model verification and code verification tasks using subprocesses, specified as a numeric or logical `0` (`false`) or `1` (`true`).

Example: `true`

Data Types: `logical`

processAdvisorGitHubExampleStart

Set up Process Advisor example for GitHub

Syntax

`processAdvisorGitHubExampleStart`

Description

`processAdvisorGitHubExampleStart` sets up Process Advisor example for GitHub (same as `processAdvisorExampleStart(CI = "github", PipelineGen = false)`).

The example includes a pipeline configuration file that can automatically generate a pipeline for GitHub.

processAdvisorGitLabExampleStart

Set up Process Advisor example for GitLab

Syntax

```
processAdvisorGitLabExampleStart
```

Description

`processAdvisorGitLabExampleStart` sets up Process Advisor example for GitLab (same as `processAdvisorExampleStart(CI="gitlab")`).

The example includes a pipeline configuration file that can automatically generate a pipeline for GitLab.

processAdvisorJenkinsExampleStart

Set up Process Advisor example for Jenkins

Syntax

`processAdvisorJenkinsExampleStart`

Description

`processAdvisorJenkinsExampleStart` sets up Process Advisor example for Jenkins (same as `processAdvisorExampleStart(CI="jenkins")`).

The example includes a pipeline configuration file that can automatically generate a pipeline for GitLab. You need to update the example Jenkinsfile to specify the bin directory for your MATLAB installation and the Git branch, credentials, and URL for your repository.

processAdvisorProjectReferenceExampleStart

Set up Process Advisor example that uses project references

Syntax

```
processAdvisorProjectReferenceExampleStart
processAdvisorProjectReferenceExampleStart(Name=Value)
```

Description

`processAdvisorProjectReferenceExampleStart` sets up a Process Advisor example project that uses project references.

`processAdvisorProjectReferenceExampleStart(Name=Value)` sets up the project using the specified options.

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `processAdvisorProjectReferenceExampleStart(Subprocess = true)`

`Subprocess` — Set up example project to group model verification and code verification tasks using subprocesses
`false` or `0` (default) | `true` or `1`

Set up example project to group model verification and code verification tasks using subprocesses, specified as a numeric or logical `0` (`false`) or `1` (`true`).

Example: `true`

Data Types: `logical`

Artifact Types

Valid Artifact Types

The build system uses artifact types to identify and categorize the different file types and modeling constructs in your project.

You can use an artifact type to find specific types of artifacts in your project:

```
% Find model files in the project
% by using the artifact type "sl_model_file"
q = padv.builtin.query.FindArtifacts(...
ArtifactType="sl_model_file");
results = run(q);
results.Address
```

You can also use an artifact type to create a `padv.Artifact` object that represents a specific artifact and run tasks associated with that artifact:

```
% specify the relative path to the model AHRS_Voter
model = padv.Artifact("sl_model_file",...
padv.util.ArtifactAddress(...
fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx")));

% run only the tasks for the AHRS_Voter model
runprocess(FilterArtifact = model)
```

The following table lists the valid artifact types.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file

Artifact Type	Description
"sl_embedded_matlab_fcn"	MATLAB function
"sl_harness_block_diagram"	Harness block diagram
"sl_harness_file"	Test harness file
"sl_library_file"	Library file
"sl_model_file"	Simulink model file
"sl_protected_model_file"	Protected Simulink model file
"sl_req_table"	Requirements Table
"sl_subsystem"	Subsystem
"sl_subsystem_file"	Subsystem file
"sl_test_case"	Simulink Test case
"sl_test_case_result"	Simulink Test case result
"sl_test_file"	Simulink Test file
"sl_test_iteration"	Simulink Test iteration
"sl_test_iteration_result"	Simulink Test iteration result
"sl_test_report_file"	Simulink Test result report
"sl_test_result_file"	Simulink Test result file
"sl_test_resultset"	Simulink Test result set
"sl_test_seq"	Test Sequence
"sl_test_suite"	Simulink Test suite
"sl_test_suite_result"	Simulink Test suite result
"zc_block_diagram"	System Composer architecture
"zc_component"	System Composer architecture component
"zc_file"	System Composer architecture file

10

Tokens

Dynamically Resolve Paths Using Tokens

The default process model and built-in task source code use the following tokens as placeholders for dynamic path resolution of artifacts, directories, and other information relevant to the process:

Token	Description
`$INPUTARTIFACT$`	Input artifact for task
`$ITERATIONARTIFACT$`	Current artifact that the task is acting on
`$PWD$`	Current working directory
`$TIMESTAMP$`	Current date and time in the format `'yyyy_mm_dd_HH_MM_ss'`
`$PROJECTROOT$`	Root folder of project
`$TASKNAME$`	Task name or title
`$DEFAULTOUTPUTDIR$`	Default output directory for the process model
`$ROOTITERATIONARTIFACT$`	Root-level artifact for the iteration artifact

You can use these tokens in your process model, but note that:

- The output directory of a task cannot be specified as `$PROJECTROOT$`.
- The tokens `$PWD$` and `$TIMESTAMP$` are not supported by the pipeline generator.

Built-In Task Library

The support package CI/CD Automation for Simulink Check contains several built-in tasks that you can use when you define your process. You can reconfigure the tasks in the process model to change the task behavior. After you install the support package, you can view the source code files for the built-in tasks. In the MATLAB Command Window, enter:

```
cd(fullfile(matlabshared.supportpkg.getSupportPackageRoot,...
"toolbox","padv","build_service","ml","+padv","+builtin","+task"))
```

The built-in tasks include tasks for generating model reports, performing model analysis, running tests, generating code, and analyzing code:

Goal	Task Title	Task Instance	Requires License	Requires Display*
Model Reports	**Generate SDD Report**	`padv.builtin.task.GenerateSDDReport`	Simulink Report Generator™	✔
	Generate Simulink Web View	`padv.builtin.task.GenerateSimulinkWebView`		✔
	Generate Model Comparison	`padv.builtin.task.GenerateModelComparison`	Simulink	✔
Model Analysis	**Check Modeling Standards**	`padv.builtin.task.RunModelStandards`	Simulink Check	
	Detect Design Errors	`padv.builtin.task.DetectDesignErrors`	Simulink Design Verifier™	
Testing and Coverage	**Merge Test Results**	`padv.builtin.task.MergeTestResults`	Simulink Test	
	Run Tests	`padv.builtin.task.RunTestsPerModel`		
	Run Tests	`padv.builtin.task.RunTestsPerTestCase`		
Collect Model Design and Testing Metrics	**Collect Metrics**	`padv.builtin.task.CollectMetrics`	Simulink Check	
Code Generation	**Generate Code**	`padv.builtin.task.GenerateCode`	Embedded Coder	

Goal	Task Title	Task Instance	Requires License	Requires Display*
Code Analysis	**Check Coding Standards** or **Prove Code Quality**	`padv.builtin.task.AnalyzeModelCode`	Polyspace® Bug Finder™ or Polyspace Code Prover™	
	Inspect Code	`padv.builtin.task.RunCodeInspection`	Simulink Code Inspector	

*Built-in tasks that require a display might generate an error when there is no display available. If you run MATLAB using the `-nodisplay` option or you use a machine that does not have a display (like many CI runners and Docker containers), you should set up a virtual display server on that machine before you run the tasks. For information, see "Set Up Virtual Display for No-Display Machine" in the User's Guide.

Reference pages for the built-in task are listed alphabetically on the following pages:

padv.builtin.task.AnalyzeModelCode Class

Namespace: `padv.builtin.task padv.builtin.task padv.builtin.task`
Superclasses: `padv.Task`

Task for checking coding standards or proving code quality with Polyspace

Description

The `padv.builtin.task.AnalyzeModelCode` class provides a task that can check coding standards or prove code quality. By default, the task quickly analyzes generated model code for many types of run-time defects, coding standards, and code metrics by using Polyspace Bug Finder. But you can use the property `VerificationMode` to reconfigure the task to check *every* operation in your code for a set of possible run-time errors and try to prove the absence of the error for all execution paths by using Polyspace Code Prover. For more information, see VerificationMode.

This task runs on the generated model code, iterating over either each model in the project or the project itself. If a model does not have generated code, the task skips the model and displays a warning message. You can generate code using the built-in task `padv.builtin.task.GenerateCode` and then analyze the generated code using the `AnalyzeModelCode` task. You can add these tasks to your process model by using the method `addTask`. After you add the tasks to your process model, you can run the tasks from the Process Advisor app or by using the function `runprocess`.

To view the source code for this built-in task, in the MATLAB Command Window, enter:

```
open padv.builtin.task.AnalyzeModelCode
```

The `padv.builtin.task.AnalyzeModelCode` class is a `handle` class.

Note Starting in R2023b, this task is not supported on macOS (Apple silicon).

Creation

Description

`task = padv.builtin.task.AnalyzeModelCode()` creates a task for checking coding standards with Polyspace Bug Finder.

`task = padv.builtin.task.AnalyzeModelCode(Name=Value)` sets certain properties using one or more name-value arguments. For example, `task = padv.builtin.task.AnalyzeModelCode(Name = "MyAnalyzeModelCode")` creates a task with the specified name.

You can use this syntax to set property values for `TreatAsRefModel`, `Name`, `Title`, `DescriptionText`, `DescriptionCSH`, `IterationQuery`, `InputQueries`, `InputDependencyQuery`, `LaunchToolAction`, and `LaunchToolText`.

The class also has other properties, but you cannot set those properties during task creation.

Properties

The `AnalyzeModelCode` class inherits properties from `padv.Task`. The properties listed in "Specialized Inherited Properties" on page 11-0 are `padv.Task` properties that the `AnalyzeModelCode` task overrides.

The task also has properties for specifying:

- "General Polyspace Options" on page 11-0 for specifying the verification mode, result directory, and generated reports
- "Advanced Polyspace Analysis Options" on page 11-0 for batch and scheduler options
- "Advanced Polyspace Project Options" on page 11-0 for managing project files
- "Advanced Polyspace Access Configuration Options" on page 11-0 for uploading results to Polyspace Access™

Specialized Inherited Properties

`Name` — Unique identifier for task in process
`"padv.builtin.task.AnalyzeModelCode"` (default) | string

Unique identifier for task in process, specified as a string.

Example: `"MyAnalyzeModelCode"`

Data Types: `string`

`Title` — Human-readable name that appears in Process Advisor app
`"Check Coding Standards"` (default) | string

Human-readable name that appears in Process Advisor app, specified as a string.

Example: `"My Analyze Model Code Task"`

Data Types: `string`

`DescriptionText` — Task description
`"This task uses Polyspace Bug Finder to analyze generated model code for run-time defects, coding standards, and code metrics."` (default) | string

Task description, specified as a string.

When you point to a task in Process Advisor and click the information icon, the tooltip shows the task description.

Example: `"This task analyzes generated model code."`

Data Types: `string`

`DescriptionCSH` — Path to task documentation
path to `AnalyzeModelCode` documentation (default) | string

Path to task documentation, specified as a string.

When you point to a task in Process Advisor, click the ellipsis (**...**), and click **Help**, Process Advisor opens the task documentation.

Example: `fullfile(pwd,"taskHelpFiles","myTaskDocumentation.pdf")`

Data Types: `string`

`RequiredIterationArtifactType` — Artifact type that task can run on
`"sl_model_file"` | ...

Type of artifact, specified as one or more of the values listed in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration

Artifact Type	Description
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

`IterationQuery` — Find artifacts that task iterates over
`padv.builtin.query.FindModels` (default) | `padv.Query` object | name of `padv.Query` object

Query that finds the artifacts that the task iterates over, specified as a `padv.Query` object or the name of a `padv.Query` object. When you specify `IterationQuery`, the task runs one time *for each* artifact returned by the query. In the Process Advisor app, the artifacts returned by `IterationQuery` appear under task title.

By default, this task runs on the generated model code, iterating over either each model in the project or the project itself. If a model does not have generated code, the task skips the model and displays a warning message.

For more information about task iterations, see “Overview of Process Model Customizations” in the User's Guide PDF.

Example: `padv.builtin.query.FindProjectFile`

`Licenses` — List of licenses that task requires
`["matlab_coder" "real-time_workshop" "rtw_embedded_coder"]` (default) | string

List of licenses that the task requires, specified as a string.

Data Types: `string`

`LaunchToolAction` — Function that launches tool
`@launchToolAction` (default) | function handle

Function that launches a tool, specified as the function handle.

When you point to a task in the Process Advisor app, you can click the ellipsis (**...**) to see more options. For built-in tasks, you have the option to launch a tool associated with the task.

For the task `AnalyzeModelCode`, you can launch the Polyspace Code Verifier app.

Data Types: `function_handle`

`LaunchToolText` — Description of action that `LaunchToolAction` property performs
`"Open Polyspace Code Verifier"` (default) | string

Description of the action that the `LaunchToolAction` property performs, specified as a string.

Data Types: `string`

`InputQueries` — Inputs to task
`padv.builtin.query.GetOutputsOfDependentTask(Task="padv.builtin.task.GenerateCode")` (default) | `padv.Query` object | name of `padv.Query` object | array of `padv.Query` objects

Inputs to the task, specified as:

- a `padv.Query` object
- the name of `padv.Query` object
- an array of `padv.Query` objects
- an array of names of `padv.Query` objects

By default, the task `AnalyzeModelCode` gets the model and generated code inputs by using the built-in queries:

- `padv.builtin.query.GetIterationArtifact`
- `padv.builtin.query.GetOutputsOfDependentTask` on the task `padv.builtin.task.GenerateCode`

`InputDependencyQuery` — Finds artifact dependencies for task inputs
`padv.builtin.query.GetDependentArtifacts` (default) | `padv.Query` object | name of `padv.Query` object

Query that finds artifact dependencies for task inputs, specified as a `padv.Query` object or the name of a `padv.Query` object.

The build system runs the query specified by `InputDependencyQuery` to find the dependencies for the task inputs, since those dependencies can impact if task results are up-to-date.

For more information, see “Overview of Process Model Customizations” in the User's Guide PDF.

Example: `padv.builtin.query.GetDependentArtifacts`

General Polyspace Options

`TreatAsRefModel` — Treat code as code generated by reference model
`""` (default) | `true` | `false`

Treat code as code generated by reference model, specified as either `""`, `true`, or `false`.

By default, the task automatically identifies whether a model is a top model or a reference model before analyzing the model code. But you can specify `TreatAsRefModel` as `true` or `false` if you want to override the behavior and only analyze reference model code or top model code.

Example: `true`

Data Types: `logical`

`ResultDir` — Directory where build system stores results from analyzing model code
`fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$', 'ps_results')` (default) | string

Directory where build system stores results from analyzing model code, specified as a string.

Data Types: `string`

`Reports` — Reports output by task
`["BugFinderSummary" "CodingStandards"]` (default) | string

Reports output by task, specified as a string.

Data Types: `string`

`ReportPath` — Path to reports output by task
`string(fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$', 'ps_results'))` (default) | string

Path to reports output by task, specified as a string.

Data Types: `string`

`ReportFormat` — Format of output reports
`"PDF"` (default) | `"HTML"` | `"WORD"` | comma-separated list of formats

Format of output reports, specified as either:

- `"PDF"` — PDF file.
- `"HTML"` — HTML report.
- `"WORD"` — Microsoft Word document.
- Combination of these formats, specified as a comma-separate list. For example, `"PDF,HTML"` generates multiple reports. One in PDF format and one in HTML format.

Example: `"HTML"`

Data Types: `string`

`ReportNames` — Names of output reports
`["$ITERATIONARTIFACT$_BugFinderSummary" "$ITERATIONARTIFACT$_CodingStandards"]` (default) | string

Names of output reports, specified as a string.

Data Types: `string`

`VerificationMode` — Polyspace mode
`"BugFinder"` (default) | `"CodeProver"`

Polyspace mode, specified as either:

- `"BugFinder"` — Quickly analyze generated model code for many types of run-time defects, coding standards, and code metrics by using Polyspace Bug Finder.
- `"CodeProver"` — Check *every* operation in your code for a set of possible run-time errors and try to prove the absence of the error for all execution paths by using Polyspace Code Prover.

You can use both Bug Finder and Code Prover in your software development process, but each task instance must have a unique `Name` and you need to configure the tasks to prevent the tasks from overwriting each other.

For information on the differences between Bug Finder and Code Prover, see “Differences Between Polyspace Bug Finder and Polyspace Code Prover” (Polyspace Bug Finder).

Example: `"CodeProver"`

Advanced Polyspace Analysis Options

`Batch` — Option to run analysis on server (`-batch`)
`false` or `0` (default) | `true` or `1`

Option to run analysis on server (`-batch`), specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`Scheduler` — Specify cluster or job scheduler (`-scheduler`)
`string.empty` (default) | string

Specify cluster or job scheduler (`-scheduler`), specified as a string.

Example: `"NodeHost"`

Data Types: `string`

Advanced Polyspace Project Options

`SavePsPrjFileAfterAnalysis` — Save Polyspace project file after analyzing model code
`true` or `1` (default) | `false` or `0`

Save Polyspace project file after analyzing model code, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`PsPrjFileName` — Polyspace project file path
`"$ITERATIONARTIFACT$_BugFinder"` (default) | string

Polyspace project file path, specified as a string.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see "Dynamically Resolve Paths Using Tokens" on page 10-2.

Data Types: `string`

Advanced Polyspace Access Configuration Options

`PsAccessEnable` — Upload results to Polyspace Access
`false` or `0` (default) | `true` or `1`

Enable task to upload analysis results to Polyspace Access, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Note If you specify `PsAccessEnable` as `true`, you must also specify values for the other Polyspace Access Configuration Options. For information, see "Upload Results to Polyspace Access" on page 11-15.

Example: `true`

Data Types: `logical`

`PsAccessHostName` — Polyspace Access machine host name
`""` (default) | string

Polyspace Access machine host name, specified as a string. You can find the host name in the URL of the Polyspace Access interface, for example, `https://`*`hostname`*`:port/metrics/index.html`.

Example: `my-company-server`

Data Types: `string`

`PsAccessPortNumber` — Polyspace Access port
`"9443"` (default) | string

Polyspace Access port, specified as a string. You can find the port number in the URL of the Polyspace Access interface, for example, `https://hostname:`*`portNumber`*`/metrics/index.html`.

Example: `"9999"`

Data Types: `string`

`PsAccessProtocol` — HTTP protocol used to access Polyspace Access
`"https"` (default) | `"http"`

HTTP protocol used to access Polyspace Access, specified as either `"http"` or `"https"`.

Example: `"http"`

`PsAccessCredentialsFile` — Full path to text file where you store your login credentials for Polyspace Access
`string.empty` (default) | string

Full path to text file where you store your login credentials for Polyspace Access, specified as a string.

A credentials file is useful if you do not want to store your credentials in your process model. For information on how to create a credentials file, see “Encrypt Password and Store Login Options in a Variable” (Polyspace Bug Finder).

Alternatively, you can specify an API key (`PsAccessApiKey`) or a username and password (`PsAccessUserName` and `PsAccessEncryptedPassword`) to pass your credentials to Polyspace Access.

Example: `"C:\Users\username\myCredentials.txt"`

Data Types: `string`

`PsAccessApiKey` — API key for Polyspace Access
`string.empty` (default) | string

API key for Polyspace Access, specified as a string.

For information on API keys and how to assign an API key to a user, see `login options`.

Alternatively, you can use a credentials file (`PsAccessCredentialsFile`) or a username and password (`PsAccessUserName` and `PsAccessEncryptedPassword`) to pass your credentials to Polyspace Access.

Example: `"keyValue123"`

Data Types: `string`

`PsAccessUserName` — Username for Polyspace Access
`""` (default) | string

Username for Polyspace Access, specified as a string.

For information on login credentials, see `login options`.

Alternatively, you can use a credentials file (`PsAccessCredentialsFile`) or an API key (`PsAccessApiKey`) to pass your credentials to Polyspace Access.

Data Types: `string`

`PsAccessEncryptedPassword` — Password for Polyspace Access
`""` (default) | string

Password for Polyspace Access, specified as a string.

For information on login credentials, see `login options`.

Alternatively, you can use a credentials file (`PsAccessCredentialsFile`) or an API key (`PsAccessApiKey`) to pass your credentials to Polyspace Access.

Data Types: `string`

`PsAccessParentFolder` — Path of parent folder in Polyspace Access explorer
`""` (default) | string

Path of parent folder in Polyspace Access explorer under which you store uploaded results, specified as a string.

For more information, see `upload options`.

Example: `"public/myProject"`

Data Types: `string`

`PsAccessResultsName` — Name of uploaded results in Polyspace Access explorer
`""` (default) | string

Name of uploaded results in Polyspace Access explorer, specified as a string.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

For more information, see `upload options`.

Example: `"$ITERATIONARTIFACT$_CodingStandards"`

Data Types: `string`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run Polyspace analysis. Depending on the `VerificationMode` property value, the task runs either Polyspace Bug Finder or Polyspace Code Prover.
	
	Note You do not need to manually invoke this method. When you run a task using the Process Advisor app or the `runprocess` function, the build system automatically invokes the `run` method for the task.
	
	The `run` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this built-in task, make sure to use the same method signature inside your custom task:
	`function taskResult = run(obj, input)`
	`  ...`
	`end`

`dryRun`	Dry-run the task to validate task inputs and generate representative task outputs without actually running the task.The `dryRun` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this class, make sure to use the same method signature inside your custom task:
	`function taskResult = dryRun(obj, input)`
	`    ...`
	`end`

`launchToolAction`	Launch the Polyspace Code Verifier app. Process Advisor uses this method when you open the tool associated with a task.

Examples

Add Polyspace Bug Finder Task to Process

Add a task that can quickly analyze generated model code for many types of run-time defects, coding standards, and code metrics by using Polyspace Bug Finder.

Open the process model for your project. If you do not have a process model, open the Process Advisor app to automatically create a process model.

In the process model file, add the `AnalyzeModelCode` task to your process model by using the `addTask` method. By default, the `AnalyzeModelCode` task performs Bug Finder analysis.

```
psbfTask = pm.addTask(padv.builtin.task.AnalyzeModelCode);
```

You can reconfigure the task behavior by using the task properties. For example, to use a custom configuration from a Polyspace project (`.psprj`) file and customize the task outputs:

```
psbfTask.addInputQueries(padv.builtin.query.FindFileWithAddress( ...
    Type='ps_prj_file',Path=fullfile('tools','CodingRulesOnly_config.psprj')));
psbfTask.ResultDir = string(fullfile('$DEFAULTOUTPUTDIR$', ...
    '$ITERATIONARTIFACT$','coding_standards'));
psbfTask.Reports = "CodingStandards";
psbfTask.ReportPath = string(fullfile('$DEFAULTOUTPUTDIR$', ...
    '$ITERATIONARTIFACT$','coding_standards'));
psbfTask.ReportNames = "$ITERATIONARTIFACT$_CodingStandards";
psbfTask.ReportFormat = "PDF";
```

The `AnalyzeModelCode` task requires outputs from the `GenerateCode` task. Specify this dependency in your process model by using the `dependsOn` method.

To make sure that you run your tasks using the built-in task `GenerateCode` before you add the task, you can use conditional logic in your process model. For example:

```
includeGenerateCodeTask = true;
includeAnalyzeModelCode = true && exist('polyspaceroot','file');

%% Generate Code
% Tools required: Embedded Coder
% By default, generating code for each model in the project
if includeGenerateCodeTask
    codegenTask = pm.addTask(padv.builtin.task.GenerateCode);
    % ... Optionally specify task property values
end

%% Check coding standards
% Tools required: Polyspace Bug Finder
if includeGenerateCodeTask && includeAnalyzeModelCode
    psbfTask = pm.addTask(padv.builtin.task.AnalyzeModelCode);
    % ... Optionally specify task property values
end

% Set task dependencies
if includeGenerateCodeTask && includeAnalyzeModelCode
    psbfTask.dependsOn(codegenTask);
end
```

This code also makes sure that Polyspace is installed and integrated by checking if the Polyspace installation folder (`polyspaceroot`) exists before adding the task to the process model.

Add Polyspace Code Prover Task to Process

Add a task that can check *every* operation in your code for a set of possible run-time errors and try to prove the absence of the error for all execution paths by using Polyspace Code Prover.

Open the process model for your project.

In the process model file, add the AnalyzeModelCode task to your process model by using the addTask function. To have the task use Polyspace Code Prover, specify the VerificationMode as "CodeProver".

```
pscpTask = pm.addTask(padv.builtin.task.AnalyzeModelCode(Name="ProveCodeQuality"));
    pscpTask.Title = "Prove Code Quality";
    pscpTask.VerificationMode = "CodeProver";
```

This code also specifies values for the Name and Title properties since the default task name and title refer to Bug Finder analysis. You can use the other task properties to specify the report templates and other task settings.

You can reconfigure the task behavior by using the task properties. For example:

```
pscpTask.ResultDir = string(fullfile('$DEFAULTOUTPUTDIR$', ...
    '$ITERATIONARTIFACT$','code_quality'));
pscpTask.Reports = ["Developer", "CallHierarchy", "VariableAccess"];
pscpTask.ReportPath = string(fullfile('$DEFAULTOUTPUTDIR$', ...
    '$ITERATIONARTIFACT$','code_quality'));
pscpTask.ReportNames = [...
    "$ITERATIONARTIFACT$_Developer", ...
    "$ITERATIONARTIFACT$_CallHierarchy", ...
    "$ITERATIONARTIFACT$_VariableAccess"];
pscpTask.ReportFormat = "PDF";
```

The AnalyzeModelCode task requires outputs from the GenerateCode task. Specify this dependency in your process model by using the dependsOn method.

To make sure that you run your tasks using the built-in task GenerateCode before you add the task, you can use conditional logic in your process model. For example:

```
includeGenerateCodeTask = true;
includeProveCodeQuality = true && (~isempty(ver('pscodeprover')) || ~isempty(ver('pscodeproverse

%% Generate Code
% Tools required: Embedded Coder
% By default, generating code for each model in the project
if includeGenerateCodeTask
    codegenTask = pm.addTask(padv.builtin.task.GenerateCode);
    % ... Optionally specify task property values
end

%% Prove Code Quality
% Tools required: Polyspace Code Prover
if includeGenerateCodeTask && includeProveCodeQuality
    pscpTask = pm.addTask(padv.builtin.task.AnalyzeModelCode(Name="ProveCodeQuality"));
    pscpTask.Title = "Prove Code Quality";
    pscpTask.VerificationMode = "CodeProver";
    % ... Optionally specify task property values
end

% Set task dependencies
if includeGenerateCodeTask && includeProveCodeQuality
    pscpTask.dependsOn(codegenTask);
end
```

This code also makes sure that Polyspace Code Prover is available before adding the task to the process model.

Add Both Bug Finder and Code Prover Tasks to Process

You can use both Bug Finder and Code Prover in your software development workflow. Both Polyspace Bug Finder and Polyspace Code Prover detect run-time errors through static analysis.

- Bug Finder quickly analyzes your code and detects many types of defects.
- Code Prover checks every operation in your code for a set of possible run-time errors and try to prove the absence of the error for all execution paths.

To include both a Bug Finder task and a Code Prover task in your process model, you must add two separate instances of the `AnalyzeModelCode` task to the process model. Each instance needs a unique value for the `Name` property. Use the `VerificationMode` property to specify whether the task uses Bug Finder (default) or Code Prover (`"CodeProver"`). You can use the other task properties to specify the report templates and other task settings. For example, in your process model:

```
%% Check Coding Standards with Polyspace Bug Finder
psbfTask = pm.addTask(padv.builtin.task.AnalyzeModelCode());
% Report Options
psbfTask.ResultDir = fullfile(defaultResultPath,"bug_finder");
psbfTask.ReportPath = fullfile(defaultResultPath,"bug_finder");

%% Prove Code Quality with Polyspace Code Prover
pscpTask = pm.addTask(padv.builtin.task.AnalyzeModelCode(Name="ProveCodeQuality"));
pscpTask.Title = "Prove Code Quality";
pscpTask.VerificationMode = "CodeProver";
% Report Options
pscpTask.ResultDir = string(fullfile(defaultResultPath,"code_prover"));
pscpTask.Reports = ["Developer", "CallHierarchy", "VariableAccess"];
pscpTask.ReportPath = string(fullfile(defaultResultPath,"code_prover"));
pscpTask.ReportNames = [...
    "$ITERATIONARTIFACT$_Developer", ...
    "$ITERATIONARTIFACT$_CallHierarchy", ...
    "$ITERATIONARTIFACT$_VariableAccess"];
```

Note that this code specifies different result directories and report paths for each task to prevent the task outputs from overwriting each other.

For information on:

- Bug Finder and Code Prover, see “Differences Between Bug Finder and Code Prover” (Polyspace Bug Finder).
- How Bug Finder and Code Prover fit into a software development workflow, see “Workflow Using Both Polyspace Bug Finder and Polyspace Code Prover” (Polyspace Bug Finder).

Upload Results to Polyspace Access

If you have a Polyspace Access license, you can reconfigure the `AnalyzeModelCode` task to automatically upload results to Polyspace Access for your team to review.

Before you reconfigure the task, make sure that you have performed this one-time setup “Prerequisites” (Polyspace Bug Finder).

To reconfigure the task, update your process model to specify the property `PsAccessEnable` as `true` and to specify values for these properties:

- `PsAccessHostName`
- `PsAccessPortNumber`
- `PsAccessProtocol`
- `PsAccessParentFolder`
- And one of the following sets of credentials:
  - `PsAccessCredentialsFile`
  - `PsAccessApiKey`
  - `PsAccessUserName` and `PsAccessEncryptedPassword`

For example, in your process model:

```
%% Check coding standards
psTask = pm.addTask(padv.builtin.task.AnalyzeModelCode());
psTask.addInputQueries(padv.builtin.query.FindFileWithAddress( ...
    Type = "ps_prj_file",...
    Path = fullfile("tools","CodingRulesOnly_config.psprj")));
psTask.ResultDir = string(fullfile("$DEFAULTOUTPUTDIR$", ...
    "$ITERATIONARTIFACT$","coding_standards"));
psTask.Reports = "CodingStandards";
psTask.ReportPath = string(fullfile("$DEFAULTOUTPUTDIR$", ...
    "$ITERATIONARTIFACT$","coding_standards"));
psTask.ReportNames = "$ITERATIONARTIFACT$_CodingStandards";
psTask.ReportFormat = "PDF";

% Polyspace Access configuration options
psTask.PsAccessEnable = true;
psTask.PsAccessHostName = "my-polyspace-access";
psTask.PsAccessPortNumber = "9443";
psTask.PsAccessProtocol = "https";
psTask.PsAccessCredentialsFile = "C:\Users\username\myCredentials.txt";
psTask.PsAccessParentFolder = "public/myProject";
psTask.PsAccessResultsName = "$ITERATIONARTIFACT$_CodingStandards";
```

This code uses a credentials file, `myCredentials.txt`, to pass credentials to Polyspace Access, but you can also use an API key or a username and password. For information on how to generate and maintain credentials for Polyspace Access, see `login options`.

For information on Polyspace Access, see “Send Bug Finder Analysis from Desktop to Locally Hosted Server” (Polyspace Bug Finder) and “Run Polyspace Bug Finder on Server and Upload Results to Web Interface” (Polyspace Bug Finder).

Tips

- This task requires that your Polyspace installation is integrated with MATLAB and Simulink. If you have not already integrated your installation, use the function `polyspacesetup`. For information, see “Integrate Polyspace with MATLAB and Simulink” (Polyspace Bug Finder).

- If you start MATLAB with the `-batch` option, the task requires a Polyspace server product. The required server product depends on the task configuration:
  - **Check Coding Standards** (default) — Requires the Polyspace Bug Finder Server™ product.
  - **Prove Code Quality** — Requires the Polyspace Code Prover Server product.
- You can use both Bug Finder and Code Prover in your software development workflow. For information on how to include both a Bug Finder task and a Code Prover task in your process model, see “Add Both Bug Finder and Code Prover Tasks to Process” on page 11-15.

  For information on the differences between Bug Finder and Code Prover, see “Differences Between Polyspace Bug Finder and Polyspace Code Prover” (Polyspace Bug Finder).

See Also

`addTask` | `padv.builtin.task.RunCodeInspection` | `padv.builtin.task.GenerateCode` | `padv.builtin.query.FindCodeForModel` | `padv.ProcessModel` | Process Advisor | `runprocess`

Topics

“Integrate Polyspace with MATLAB and Simulink” (Polyspace Bug Finder)
“Differences Between Polyspace Bug Finder and Polyspace Code Prover” (Polyspace Bug Finder)
“Workflow Using Both Polyspace Bug Finder and Polyspace Code Prover” (Polyspace Bug Finder)
“Run Polyspace Bug Finder on Server and Upload Results to Web Interface” (Polyspace Bug Finder)

padv.builtin.task.CollectMetrics Class

Namespace: `padv.builtin.task padv.builtin.task padv.builtin.task`
Superclasses: `padv.Task`

Task for collecting model design and testing metrics

Description

The `padv.builtin.task.CollectMetrics` class provides a task that can collect model design and testing metrics using the `metric.Engine` API for the Model Design and Model Testing Dashboards. By default, the task collects model maintainability metrics that can help you monitor the size, architecture, and complexity of the software units and components in your project. But you can reconfigure the task to collect model testing, SIL code testing, or PIL code testing metrics by using the `Dashboard` property to specify which dashboard you want to collect metrics for. You can add these tasks to your process model by using the method `addTask`. After you add the tasks to your process model, you can run the tasks from the Process Advisor app or by using the function `runprocess`.

To view the source code for this built-in task, in the MATLAB Command Window, enter:

```
open padv.builtin.task.CollectMetrics
```

The `padv.builtin.task.CollectMetrics` class is a `handle` class.

Creation

Description

`task = padv.builtin.task.CollectMetrics()` creates a task for collecting model maintainability metrics like size, architecture, and complexity. These are the same metric results that the Model Maintainability Dashboard uses.

`task = padv.builtin.task.CollectMetrics(Name=Value)` sets certain properties using one or more name-value arguments. For example, `task = padv.builtin.task.CollectMetrics(Name = "MyCollectMetricsTask")` creates a task with the specified name.

You can use this syntax to set property values for `InputQueries`, `Name`, `IterationQuery`, `InputDependencyQuery`, `Licenses`, `LaunchToolAction`, and `LaunchToolText`.

The `padv.builtin.task.CollectMetrics` class also has other properties, but you cannot set those properties during task creation.

Properties

The `CollectMetrics` class inherits properties from `padv.Task`. The properties listed in “Specialized Inherited Properties” on page 11-0 are `padv.Task` properties that the `CollectMetrics` task overrides.

The task also has properties for specifying “Metric Collection Options” on page 11-0 . The task uses these properties to specify input arguments for the `getAvailableMetricIds`, `execute`, and `generateReport` functions of the `metric.Engine` API.

Specialized Inherited Properties

`Name` — Unique identifier for task in process
`"padv.builtin.task.CollectMetrics"` (default) | string

Unique identifier for task in process, specified as a string.

Example: `"MyCollectMetricsTask"`

Data Types: `string`

`Title` — Human-readable name that appears in Process Advisor app
`"Collect Model Maintainability Metrics"` (default) | string

Human-readable name that appears in Process Advisor app, specified as a string.

Example: `"My Metric Collection Task"`

Data Types: `string`

`DescriptionText` — Task description
`"This task collects and reports metric data used by the model design and testing dashboards."` (default) | string

Task description, specified as a string.

When you point to a task in Process Advisor and click the information icon, the tooltip shows the task description.

Example: `"This task collects and reports metric data used by the model design and testing dashboards."`

Data Types: `string`

`DescriptionCSH` — Path to task documentation
path to `CollectMetrics` documentation (default) | string

Path to task documentation, specified as a string.

When you point to a task in Process Advisor, click the ellipsis (**...**), and click **Help**, Process Advisor opens the task documentation.

Example: `fullfile(pwd,"taskHelpFiles","myTaskDocumentation.pdf")`

Data Types: `string`

`RequiredIterationArtifactType` — Artifact type that task can run on
`"sl_model_file"` (default) | string

Artifact type that the task can run on, specified as a string. The required iteration artifact type must be the artifact type supported by the `IterationQuery` property of the task.

For a list of valid artifact types, see “Valid Artifact Types” on page 9-2.

Data Types: `string`

`IterationQuery` — Find artifacts that task iterates over
`padv.builtin.query.FindDesignModels` (default) | `padv.Query` object | name of `padv.Query` object

Query that finds the artifacts that the task iterates over, specified as a `padv.Query` object or the name of a `padv.Query` object. When you specify `IterationQuery`, the task runs one time *for each* artifact returned by the query. In the Process Advisor app, the artifacts returned by `IterationQuery` appear under task title.

For more information about task iterations, see "About the Process Model" in the User's Guide PDF.

Example: `padv.builtin.query.FindUnits`

`InputDependencyQuery` — Finds artifact dependencies for task inputs
`padv.Query` object | name of `padv.Query` object

Query that finds artifact dependencies for task inputs, specified as a `padv.Query` object or the name of a `padv.Query` object.

The build system runs the query specified by `InputDependencyQuery` to find the dependencies for the task inputs, since those dependencies can impact if task results are up-to-date.

For more information, see "About the Process Model" in the User's Guide PDF.

Example: `padv.builtin.query.GetDependentArtifacts`

`LaunchToolAction` — Function that launches tool
`@launchToolAction` (default) | function handle

Function that launches a tool, specified as the function handle.

When you point to a task in the Process Advisor app, you can click the ellipsis (**...**) to see more options. For built-in tasks, you have the option to launch a tool associated with the task.

By default, the task `CollectMetrics` can launch the Model Maintainability Dashboard. If you specify the `Dashboard` property as a value other than `"ModelMaintainability"`, the task can launch the Model Testing Dashboard instead.

Data Types: `function_handle`

`LaunchToolText` — Description of action that `LaunchToolAction` property performs
`"Open Dashboard"` (default) | string

Description of the action that the `LaunchToolAction` property performs, specified as a string.

Data Types: `string`

`InputQueries` — Inputs to task
`padv.Query` object | name of `padv.Query` object | array of `padv.Query` objects

Inputs to the task, specified as:

- a `padv.Query` object
- the name of `padv.Query` object
- an array of `padv.Query` objects

- an array of names of `padv.Query` objects

By default, the task `CollectMetrics` gets the current model that the task is iterating over by using the built-in query `padv.builtin.query.GetIterationArtifact`.

`OutputDirectory` — Location for standard task outputs
`string(fullfile('$DEFAULTOUTPUTDIR$','$ITERATIONARTIFACT$','metrics'))` (default) | string

Location for standard task outputs, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see the "Tokens" section in the Reference Book PDF.

Data Types: `string`

Metric Collection Options

`Dashboard` — Dashboard metrics to collect
`"ModelMaintainability"` (default) | `"ModelUnitPILTesting"` | `"ModelUnitSILTesting"` | `"ModelUnitTesting"`

Dashboard metrics to collect, specified as one of these values:

- `"ModelMaintainability"` — Analyze the size, architecture, and complexity of the MATLAB, Simulink, and Stateflow artifacts in your project by using the “Model Maintainability Metrics”.
- `"ModelUnitPILTesting"` — Assess the quality and completeness of processor-in-the-loop (PIL) code testing by using the “Code Testing Metrics”. Collecting these metrics requires a Simulink Test license.
- `"ModelUnitSILTesting"` — Assess the quality and completeness of software-in-the-loop (SIL) code testing by using the “Code Testing Metrics”. Collecting these metrics requires a Simulink Test license.
- `"ModelUnitTesting"` — Assess the quality, traceability, and completeness of your models, requirements, tests, and test results by using the “Model Testing Metrics”. By default, collecting these metrics requires a Requirements Toolbox™ license and Simulink Test license. If you do not want to collect requirements metrics, you can specify the property `IncludeRequirements` as `false`. When `IncludeRequirements` is `false`, the task does not require a Requirements Toolbox license.

The task uses this property to get the available metrics using the function `getAvailableMetricIds`.

Note If you specify a value other than `"ModelMaintainability"`, make sure to specify the task iteration query as `padv.builtin.query.FindUnits` since you can only collect model testing and code testing metrics on units and not components.

Example: `"ModelUnitTesting"`

`Installed` — Filter metrics based on MathWorks product installation status
`1` (`true`) (default) | `0` (`false`)

Filter metrics based on whether the associated MathWorks product is installed, specified as either:

- `1` (`true`) — Only collect metrics associated with MathWorks products installed on the current machine.
- `0` (`false`) — Try to collect metrics for each of the available metrics, even if the associated MathWorks products are not installed on the current machine.

Example: `false`

Data Types: `logical`

`IncludeRequirements` — Include requirements metrics
`1` (`true`) (default) | `0` (`false`)

Include requirements metrics in model testing metric results, specified as either:

- `1` (`true`) — If you specified the property `Dashboard` as `"ModelUnitTesting"`, the task includes requirements metrics in the model testing metric results. Collecting requirements metrics requires a Requirements Toolbox license.
- `0` (`false`) — The task does not collect requirements metrics. The task excludes metrics where the metric ID contains the word `requirement` (case insensitive).

Example: `false`

Data Types: `logical`

`ReportPath` — Path to report output by task
`string(fullfile('$DEFAULTOUTPUTDIR$','$ITERATIONARTIFACT$','metrics'))` (default) | string

Path to report output by task, specified as a string.

The task generates the report by using the function `generateReport`.

Data Types: `string`

`ReportName` — Name of output report
`"$ITERATIONARTIFACT$_ModelMaintainability"` (default) | string

Name of output report, specified as a string.

Data Types: `string`

`ReportFormat` — Format of output report
`"pdf"` (default) | `"html-file"`

Format of output report, specified as either:

- `"pdf"` — PDF file.
- `"html-file"` — HTML report.

Example: `"html-file"`

Data Types: `string`

`FilteredMetrics` — List of metrics to filter out
`string.empty` (default) | string

List of metrics to filter out, specified as a string.

For example, if you are collecting model maintainability metrics (`Dashboard` property specified as `"ModelMaintainability"`), you can skip metric collection for a metric by specifying the value of `FilteredMetrics` as the metric ID for the metric.

Example: `"slcomp.ComponentInterfaceSignals"`

Data Types: `string`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Collect metrics. Depending on the `Dashboard` property value, the task can collect either model maintainability metrics, model testing metrics, SIL code testing metrics, or PIL code testing metrics.
	
	Note You do not need to manually invoke this method. When you run a task using the Process Advisor app or the `runprocess` function, the build system automatically invokes the `run` method for the task.
	
	The `run` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this built-in task, make sure to use the same method signature inside your custom task:
	
	`function taskResult = run(obj, input)`
	`  ...`
	`end`

`dryRun`	Dry-run the task to validate task inputs and generate representative task outputs without actually running the task.The `dryRun` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this class, make sure to use the same method signature inside your custom task:
	
	`function taskResult = dryRun(obj, input)`
	`    ...`
	`end`

`launchToolAction`	By default, the task launches the Model Maintainability Dashboard. If you specified the `Dashboard` property as a value other than `"ModelMaintainability"`, the task launches the Model Testing Dashboard instead. Process Advisor uses this method when you open the tool associated with a task.

Examples

Collect Model Maintainability Metrics During Process

Add a task that can collect model maintainability metrics using the `metric.Engine` API for the Model Maintainability Dashboard.

Open the process model for your project. If you do not have a process model, open the Process Advisor app to automatically create a process model.

In the process model file, add the `CollectMetrics` task to your process model by using the `addTask` method. By default, the `CollectMetrics` task collects model maintainability metrics.

```
mmMetricTask = pm.addTask(padv.builtin.task.CollectMetrics());
```

You can reconfigure the task behavior by using the task properties. For example, to have the task return the generated metric results report as an HTML file instead of a PDF:

```
mmMetricTask.ReportFormat = "html-file";
```

Collect Model Testing and Code Testing Metrics During Process

By default, the `CollectMetrics` task collects model maintainability metrics. To collect different types of metrics, you can add multiple instances of the `CollectMetrics` to the process and reconfigure those instances to collect different metrics. For example, you can add tasks for model testing, SIL code testing, and PIL code testing metrics.

Each task instance needs a unique value for the `Name` property. To specify which metrics you want the task to collect, use the `Dashboard` property of the task. Since the dashboards collect model testing and code testing metrics for units, and not components, you need to specify the `IterationQuery` as `padv.builtin.query.FindUnits`. The other changes to the task property values give the task instances unique titles in Process Advisor and unique names for the reports that the task generates.

```
%% Collect Model Testing Metrics
mtMetricTask = pm.addTask(padv.builtin.task.CollectMetrics(...
    Name="ModelTestingMetrics",...
    IterationQuery=padv.builtin.query.FindUnits));
mtMetricTask.Title = "Collect Model Testing Metrics";
mtMetricTask.Dashboard = "ModelUnitTesting";
mtMetricTask.ReportName = "$ITERATIONARTIFACT$_ModelTesting";

%% Collect SIL Code Testing Metrics
stMetricTask = pm.addTask(padv.builtin.task.CollectMetrics(...
    Name="SILTestingMetrics",...
    IterationQuery=padv.builtin.query.FindUnits));
stMetricTask.Title = "Collect SIL Code Testing Metrics";
stMetricTask.Dashboard = "ModelUnitSILTesting";
stMetricTask.ReportName = "$ITERATIONARTIFACT$_SILTesting";

%% Collect PIL Code Testing Metrics
ptMetricTask = pm.addTask(padv.builtin.task.CollectMetrics(...
    Name="PILTestingMetrics",...
    IterationQuery=padv.builtin.query.FindUnits));
ptMetricTask.Title = "Collect PIL Code Testing Metrics";
ptMetricTask.Dashboard = "ModelUnitPILTesting";
ptMetricTask.ReportName = "$ITERATIONARTIFACT$_PILTesting";
```

You can use the other task properties to specify other task options.

To specify a preferred execution order for your tasks, you can use `runsAfter`. For example, if you want your process to merge test results before collecting model testing, SIL code testing, and PIL code testing metrics:

```
mtMetricTask.runsAfter(mergeTestTask);
stMetricTask.runsAfter(mtMetricTask);
ptMetricTask.runsAfter(stMetricTask);
```

See Also

`padv.builtin.task.GenerateCode` | `padv.builtin.task.MergeTestResults` | `padv.builtin.task.RunModelStandards` | `padv.builtin.query.FindDesignModels` | `padv.builtin.query.FindUnits`

padv.builtin.task.DetectDesignErrors Class

Namespace: `padv.builtin.task padv.builtin.task padv.builtin.task`
Superclasses: `padv.Task`

Task for detecting design errors with Simulink Design Verifier

Description

The `padv.builtin.task.DetectDesignErrors` class provides a task that can detect design errors in your models by using Simulink Design Verifier. Design error detection can identify dead logic, integer overflow, division by zero, and violations of design properties and assertions. By default, the `DetectDesignErrors` task outputs a design error detection report and data file.

You can add the task to your process model by using the method `addTask`. After you add the task to your process model, you can run the task from the Process Advisor app or by using the function `runprocess`.

To view the source code for this built-in task, in the MATLAB Command Window, enter:

```
open padv.builtin.task.DetectDesignErrors
```

The `padv.builtin.task.DetectDesignErrors` class is a `handle` class.

Creation

Description

`task = padv.builtin.task.DetectDesignErrors()` creates a task for detecting design errors with Simulink Design Verifier.

`task = padv.builtin.task.DetectDesignErrors(Name=Value)` sets certain properties using one or more name-value arguments. For example, `task = padv.builtin.task.DetectDesignErrors(Name = "MyDetectDesignErrors")` creates a task with the specified name.

You can use this syntax to set property values for `InputQueries`, `Name`, `IterationQuery`, `InputDependencyQuery`, `Licenses`, `LaunchToolAction`, and `LaunchToolText`.

The `padv.builtin.task.DetectDesignErrors` class also has other properties, but you cannot set those properties during task creation.

Properties

The `DetectDesignErrors` class inherits properties from `padv.Task`. The properties listed in “Specialized Inherited Properties” on page 11-0 are `padv.Task` properties that the `DetectDesignErrors` task overrides.

The task also has properties for specifying “Simulink Design Verifier Options” on page 11-0 for creating a design verification options object by using `sldvoptions` and generating a report by using `sldvreport`.

Specialized Inherited Properties

`Name` — Unique identifier for task in process
`"padv.builtin.task.DetectDesignErrors"` (default) | string

Unique identifier for task in process, specified as a string.

Example: `"MyDetectDesignErrors"`

Data Types: `string`

`Title` — Human-readable name that appears in Process Advisor app
`"Detect Design Errors"` (default) | string

Human-readable name that appears in Process Advisor app, specified as a string.

Example: `"Detect Run-Time Errors"`

Data Types: `string`

`DescriptionText` — Task description
`"This task uses Simulink Design Verifier to detect design errors or dead logic for your models."` (default) | string

Task description, specified as a string.

When you point to a task in Process Advisor and click the information icon, the tooltip shows the task description.

Example: `"This task uses Simulink Design Verifier to detect design errors or dead logic for your models."`

Data Types: `string`

`DescriptionCSH` — Path to task documentation
path to `DetectDesignErrors` documentation (default) | string

Path to task documentation, specified as a string.

When you point to a task in Process Advisor, click the ellipsis (**...**), and click **Help**, Process Advisor opens the task documentation.

Example: `fullfile(pwd,"taskHelpFiles","myTaskDocumentation.pdf")`

Data Types: `string`

`RequiredIterationArtifactType` — Artifact type that task can run on
`"sl_model_file"` (default) | string

Artifact type that the task can run on, specified as a string. The required iteration artifact type must be the artifact type supported by the `IterationQuery` property of the task.

For a list of valid artifact types, see “Valid Artifact Types” on page 9-2.

Data Types: `string`

IterationQuery — Find artifacts that task iterates over
padv.builtin.query.FindModels (default) | padv.Query object | name of padv.Query object

Query that finds the artifacts that the task iterates over, specified as a padv.Query object or the name of a padv.Query object. When you specify IterationQuery, the task runs one time *for each* artifact returned by the query. In the Process Advisor app, the artifacts returned by IterationQuery appear under task title.

For more information about task iterations, see "About the Process Model" in the User's Guide PDF.

InputDependencyQuery — Finds artifact dependencies for task inputs
padv.Query object | name of padv.Query object

Query that finds artifact dependencies for task inputs, specified as a padv.Query object or the name of a padv.Query object.

The build system runs the query specified by InputDependencyQuery to find the dependencies for the task inputs, since those dependencies can impact if task results are up-to-date.

For more information, see "About the Process Model" in the User's Guide PDF.

Example: padv.builtin.query.GetDependentArtifacts

Licenses — List of licenses that task requires
["simulink_coverage" "simulink_design_verifier"] (default) | string

List of licenses that the task requires, specified as a string.

Data Types: string

LaunchToolAction — Function that launches tool
@launchToolAction (default) | function handle

Function that launches a tool, specified as the function handle.

When you point to a task in the Process Advisor app, you can click the ellipsis (**...**) to see more options. For built-in tasks, you have the option to launch a tool associated with the task.

For the task DetectDesignErrors, you can launch the Design Verifier app.

Data Types: function_handle

LaunchToolText — Description of action that LaunchToolAction property performs
"Open Design Verifier" (default) | string

Description of the action that the LaunchToolAction property performs, specified as a string.

Data Types: string

InputQueries — Inputs to task
padv.Query object | name of padv.Query object | array of padv.Query objects

Inputs to the task, specified as:

- a padv.Query object
- the name of padv.Query object

- an array of `padv.Query` objects
- an array of names of `padv.Query` objects

By default, the task `DetectDesignErrors` gets the current model that the task is iterating over by using the built-in query `padv.builtin.query.GetIterationArtifact`.

`OutputDirectory` — Location for standard task outputs
`"$DEFAULTOUTPUTDIR$\$ITERATIONARTIFACT$\design_error_detections"` (default) | string

Location for standard task outputs, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see "Dynamically Resolve Paths Using Tokens" on page 10-2.

Data Types: `string`

Simulink Design Verifier Options

`DataFileName` — Folder and or file name for analysis data
`"$ITERATIONARTIFACT$_sldvdata"` (default) | string

Folder and or file name for the MAT-file that contains the data generated during the analysis, specified as a string. The data is stored in an `sldvData` structure.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see "Dynamically Resolve Paths Using Tokens" on page 10-2.

Example: `"myModel_sldvdata"`

Data Types: `string`

`DesignMinMaxCheck` — Check that intermediate and output signals in models are within range of specified minimum and maximum constraints
`"off"` (default) | `"on"`

Check that the intermediate and output signals in models are within the range of specified minimum and maximum constraints, specified as `"on"` or `"off"`.

Example: `"on"`

`DetectActiveLogic` — Analyze models for active logic
`"off"` (default) | `"on"`

Analyze models for active logic, specified as `"on"` or `"off"`. Note that this parameter is enabled only if `DetectDeadLogic` is `"on"`.

Example: `"on"`

`DetectBlockInputRangeViolations` — Analyze models for block input range violations
`"off"` (default) | `"on"`

Analyze models for block input range violations, specified as `"on"` or `"off"`.

Example: `"on"`

`DetectDeadLogic` — Analyze models for dead logic
`"off"` (default) | `"on"`

Analyze models for dead logic, specified as `"on"` or `"off"`.

Example: `"on"`

`DetectDivisionByZero` — Analyze models for division-by-zero errors
`"on"` (default) | `"off"`

Analyze models for division-by-zero errors, specified as `"on"` or `"off"`.

Example: `"off"`

`DetectDSMAccessViolations` — Analyze models for data store access violations
`"off"` (default) | `"on"`

Analyze models for data store access violations, specified as `"on"` or `"off"`.

Example: `"on"`

`DetectHISMViolationsHisl_0002` — Check usage of `rem` and `reciprocal` operations that cause non-finite results
`"on"` (default) | `"off"`

Check the usage of `rem` and `reciprocal` operations that cause non-finite results, specified as `"on"` or `"off"`.

Example: `"off"`

`DetectHISMViolationsHisl_0003` — Check usage of Square Root (`Sqrt`) operations with inputs that can be negative
`"on"` (default) | `"off"`

Check the usage of Square Root (`Sqrt`) operations with inputs that can be negative, specified as `"on"` or `"off"`.

Example: `"off"`

`DetectHISMViolationsHisl_0004` — Check usage of `log` and `log10` operations that cause non-finite results
`"on"` (default) | `"off"`

Check the usage of `log` and `log10` operations that cause non-finite results, specified as `"on"` or `"off"`.

Example: `"off"`

`DetectHISMViolationsHisl_0028` — Check usage of Reciprocal Square Root (`rSqrt`) blocks with inputs that can go zero or negative
`"on"` (default) | `"off"`

Check the usage of Reciprocal Square Root (`rSqrt`) blocks with inputs that can go zero or negative, specified as `"on"` or `"off"`.

Example: `"off"`

`DetectInfNaN` — Analyze models for non-finite and NaN floating-point values
`"off"` (default) | `"on"`

Analyze models for non-finite and NaN floating-point values, specified as `"on"` or `"off"`.

Example: `"on"`

`DetectIntegerOverflow` — Analyze models for integer and fixed-point data overflow errors
`"on"` (default) | `"off"`

Analyze models for integer and fixed-point data overflow errors, specified as `"on"` or `"off"`.

Example: `"off"`

`DetectOutOfBounds` — Analyze models for out of bounds array access errors
`"on"` (default) | `"off"`

Analyze models for out of bounds array access errors, specified as `"on"` or `"off"`.

Example: `"off"`

`DetectSubnormal` — Analyze models for subnormal floating-point values
`"off"` (default) | `"on"`

Analyze models for subnormal floating-point values, specified as `"on"` or `"off"`.

Example: `"on"`

`DisplayReport` — Display report that Simulink Design Verifier generates
`"off"` (default) | `"on"`

After analysis, display the report that Simulink Design Verifier generates, specified as `"on"` or `"off"`.

Example: `"on"`

`MaxProcessTime` — Maximum time (in seconds) that Simulink Design Verifier spends analyzing model
`300` (default) | double

Maximum time (in seconds) that Simulink Design Verifier spends analyzing a model, specified as a double.

Example: `120`

Data Types: `double`

`Options` — Options for generated report
`["summary" "objectives"]` (default) | `"summary"` | `"objectives"` | `"objects"`

Options for the generated report, specified as `"summary"`, `"objectives"`, `"objects"`, or a combination of these options in an array.

Example: `"summary"`

`ReportFormat` — Format of generated report
`"HTML"` (default) | `"PDF"`

Format of the generated report, specified as either:

- `"HTML"` — HTML format
- `"PDF"` — PDF format

Example: `"PDF"`

`ReportFilePath` — Folder and or file name for analysis report
`fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$','design_error_detections','$ITERATIONARTIFACT$_Design_Error_Detection_Report')` (default) | string

Folder and or file name for the analysis report, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Example: `"myModel_report"`

Data Types: `string`

`ShowUI` — Display messages in log window
`false` or `0` (default) | `true` or `1`

Display messages in the log window, specified as a numeric or logical `1` (`true`) or `0` (`false`). When `ShowUI` is specified as `0`, messages appear in the MATLAB Command Window.

Example: `true`

Data Types: `logical`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Detect design errors using Simulink Design Verifier
	
	Note You do not need to manually invoke this method. When you run a task using the Process Advisor app or the `runprocess` function, the build system automatically invokes the `run` method for the task.
	
	The `run` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this built-in task, make sure to use the same method signature inside your custom task:
	
	`function taskResult = run(obj, input)`
	`  ...`
	`end`

`dryRun`	Dry-run the task to validate task inputs and generate representative task outputs without actually running the task.The `dryRun` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this class, make sure to use the same method signature inside your custom task:
	
	`function taskResult = dryRun(obj, input)`
	`    ...`
	`end`

`launchToolAction`	Launch the Design Verifier app. Process Advisor uses this method when you open the tool associated with a task.

Examples

Add Design Verifier Task to Process

Add a task that can detect design errors by using Simulink Design Verifier.

Open the process model for your project. If you do not have a process model, open the Process Advisor app to automatically create a process model.

In the process model file, add the `DetectDesignErrors` task to your process model by using the `addTask` method.

```
dedObj = pm.addTask(padv.builtin.task.DetectDesignErrors);
```

You can reconfigure the task behavior by using the task properties. For example, to detect dead logic:

```
dedObj.DetectDeadLogic = "on";
```

padv.builtin.task.GenerateCode Class

Namespace: `padv.builtin.task padv.builtin.task padv.builtin.task`
Superclasses: `padv.Task`

Task for generating code with Embedded Coder

Description

The `padv.builtin.task.GenerateCode` class provides a task that can generate code by using Embedded Coder.

You can add the task to your process model by using the method `addTask`. After you add the task to your process model, you can run the task from the Process Advisor app or by using the function `runprocess`.

To view the source code for this built-in task, in the MATLAB Command Window, enter:

```
open padv.builtin.task.GenerateCode
```

The `padv.builtin.task.GenerateCode` class is a `handle` class.

Creation

Description

`task = padv.builtin.task.GenerateCode()` creates a task for generating code with Embedded Coder.

`task = padv.builtin.task.GenerateCode(Name=Value)` sets certain properties using one or more name-value arguments. For example, `task = padv.builtin.task.GenerateCode(Name = "MyCodeGenTask")` creates a task with the specified name.

You can use this syntax to set property values for `TreatAsRefModel`, `InputQueries`, `Name`, `Title`, `IterationQuery`, `InputDependencyQuery`, `DescriptionText`, `DescriptionCSH`, `Licenses`, `LaunchToolAction`, and `LaunchToolText`.

The `padv.builtin.task.GenerateCode` class also has other properties, but you cannot set those properties during task creation.

Properties

The `GenerateCode` class inherits properties from `padv.Task`. The properties listed in “Specialized Inherited Properties” on page 11-0 are `padv.Task` properties that the `GenerateCode` task overrides.

The task also has properties for specifying:

- “General Embedded Coder Options” on page 11-0 for generating code using the function `slbuild`. For more information on the `slbuild` arguments, see `slbuild`.

- “Advanced Caching and Parallel Code Generation Options” on page 11-0 .

Specialized Inherited Properties

`Name` — Unique identifier for task in process
`"padv.builtin.task.GenerateCode"` (default) | string

Unique identifier for task in process, specified as a string.

Example: `"MyCodeGenerationTask"`

Data Types: `string`

`Title` — Human-readable name that appears in Process Advisor app
`"Generate Code"` (default) | string

Human-readable name that appears in Process Advisor app, specified as a string.

Example: `"My Code Generation Task"`

Data Types: `string`

`DescriptionText` — Task description
`"This task uses Embedded Coder to generate code for models. By default, this task runs on all models in the project."` (default) | string

Task description, specified as a string.

When you point to a task in Process Advisor and click the information icon, the tooltip shows the task description.

Example: `"This task uses Embedded Coder to generate code for models. By default, this task runs on all models in the project."`

Data Types: `string`

`DescriptionCSH` — Path to task documentation
path to `GenerateCode` documentation (default) | string

Path to task documentation, specified as a string.

When you point to a task in Process Advisor, click the ellipsis (**...**), and click **Help**, Process Advisor opens the task documentation.

Example: `fullfile(pwd,"taskHelpFiles","myTaskDocumentation.pdf")`

Data Types: `string`

`RequiredIterationArtifactType` — Artifact type that task can run on
`"sl_model_file"` (default) | string

Artifact type that the task can run on, specified as a string. The required iteration artifact type must be the artifact type supported by the `IterationQuery` property of the task.

For a list of valid artifact types, see “Valid Artifact Types” on page 9-2.

Data Types: `string`

`IterationQuery` — Find artifacts that task iterates over
`padv.builtin.query.FindModels` (default) | `padv.Query` object | name of `padv.Query` object

Query that finds the artifacts that the task iterates over, specified as a `padv.Query` object or the name of a `padv.Query` object. When you specify `IterationQuery`, the task runs one time *for each* artifact returned by the query. In the Process Advisor app, the artifacts returned by `IterationQuery` appear under task title.

For more information about task iterations, see "About the Process Model" in the User's Guide PDF.

Example: `padv.builtin.query.FindProjectFile`

`InputDependencyQuery` — Finds artifact dependencies for task inputs
`padv.Query` object | name of `padv.Query` object

Query that finds artifact dependencies for task inputs, specified as a `padv.Query` object or the name of a `padv.Query` object.

The build system runs the query specified by `InputDependencyQuery` to find the dependencies for the task inputs, since those dependencies can impact if task results are up-to-date.

For more information, see "About the Process Model" in the User's Guide PDF.

Example: `padv.builtin.query.GetDependentArtifacts`

`Licenses` — List of licenses that task requires
`["matlab_coder" "real-time_workshop"]` (default) | string

List of licenses that the task requires, specified as a string.

Data Types: `string`

`LaunchToolAction` — Function that launches tool
`@launchToolAction` (default) | function handle

Function that launches a tool, specified as the function handle.

When you point to a task in the Process Advisor app, you can click the ellipsis (**...**) to see more options. For built-in tasks, you have the option to launch a tool associated with the task.

For the task `GenerateCode`, you can launch the Embedded Coder app.

Data Types: `function_handle`

`LaunchToolText` — Description of action that `LaunchToolAction` property performs
`"Open Embedded Coder"` (default) | string

Description of the action that the `LaunchToolAction` property performs, specified as a string.

Data Types: `string`

`InputQueries` — Inputs to task
`padv.Query` object | name of `padv.Query` object | array of `padv.Query` objects

Inputs to the task, specified as:

- a `padv.Query` object
- the name of `padv.Query` object
- an array of `padv.Query` objects

- an array of names of `padv.Query` objects

By default, the task `GenerateCode` gets the current model that the task is iterating over by using the built-in query `padv.builtin.query.GetIterationArtifact`.

`OutputDirectory` — Location for standard task outputs
path to code generation folder (default) | string

Location for standard task outputs, specified as a string.

By default, the task `padv.builtin.task.GenerateCode` uses the path to the code generation folder specified by the parameter **CodeGenFolder**.

Data Types: `string`

`CacheDirectory` — Location for additional cache files
path to simulation cache folder (default) | string

Location for additional cache files that the task generates, specified as a string. The cache directory can contain temporary files that do not need to be either saved in the task results or archived by a CI system.

By default, the task `padv.builtin.task.GenerateCode` uses the path to the code generation folder specified by the parameter **CacheFolder**.

Data Types: `string`

General Embedded Coder Options

`TreatAsRefModel` — Setting that controls whether task generates reference model code or top model code
`[]` (default) | `true` or `1` | `false` or `0`

Setting that controls whether the task generates reference model code or top model code, specified as either:

- `[]` — Allow the task to automatically identify whether a model is a top model or a reference model before generating code.
- `1` (`true`) — Only generate reference model code.
- `0` (`false`) — Only generate top model code.

By default, the task automatically identifies whether a model is a top model or a reference model before generating code. But you can specify `TreatAsRefModel` as `true` or `false` if you want to override that behavior and only generate reference model code or top model code.

Example: `true`

Data Types: `logical`

`GenerateCodeOnly` — Generate code versus an executable file
`false` or `0` (default) | `true` or `1`

Generate code versus an executable file, specified as a numeric or logical `1` (`true`) or `0` (`false`).

By default, the task generates code only and does not build an executable file.

Example: `true`

Data Types: `logical`

`ObfuscateCode` — Generate obfuscated C code
`false` or `0` (default) | `true` or `1`

Generate obfuscated C code, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`UpdateThisModelReferenceTarget` — Conditional rebuild option for model reference build
`"IfOutOfDateOrStructuralChange"` (default) | `"Force"` | `"IfOutOfDate"`

Conditional rebuild option for model reference build, specified as either:

- `"Force"`
- `"IfOutOfDateOrStructuralChange"`
- `"IfOutOfDate"`

Example: `"IfOutOfDate"`

`ForceTopModelBuild` — Force top model of model hierarchy to build
`false` or `0` (default) | `true` or `1`

Force top model of model hierarchy to build, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`IncludeModelReferenceSimulationTargets` — Build model reference simulation targets
`false` or `0` (default) | `true` or `1`

Build model reference simulation targets, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

Advanced Caching and Parallel Code Generation Options

`GenerateExternalCodeCache` — Setting to collect only SLXC files as task outputs
`false` or `0` (default) | `true` or `1`

Setting to collect only SLXC files as task outputs, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`ExternalCodeCacheDirectory` — Location to save SLXC file
`fullfile('$DEFAULTOUTPUTDIR$', "$ITERATIONARTIFACT$", "external_code_cache")` (default) | string

Location to save SLXC file, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Data Types: `string`

`TrackAllGeneratedCode` — Track all code files
`false` or `0` (default) | `true` or `1`

Track all code files, not just `model.c` and `model.h` files, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Generate code using Embedded Coder
	
	Note You do not need to manually invoke this method. When you run a task using the Process Advisor app or the `runprocess` function, the build system automatically invokes the `run` method for the task.
	
	The `run` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this built-in task, make sure to use the same method signature inside your custom task:
	
	`function taskResult = run(obj, input)`
	`  ...`
	`end`

`dryRun`	Dry-run the task to validate task inputs and generate representative task outputs without actually running the task.The `dryRun` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this class, make sure to use the same method signature inside your custom task:
	`function taskResult = dryRun(obj, input)`
	`    ...`
	`end`

`launchToolAction`	Launch the Embedded Coder app. Process Advisor uses this method when you open the tool associated with a task.

Examples

Add Code Generation Task to Process

Add a task that can generate code for each model in the project using Embedded Coder.

Open the process model for your project. If you do not have a process model, open the Process Advisor app to automatically create a process model.

In the process model file, add the `GenerateCode` task to your process model by using the `addTask` method.

```
codegenTask = pm.addTask(padv.builtin.task.GenerateCode);
```

You can reconfigure the task behavior by using the task properties. For example, to rebuild models if the build process detects changes in known dependencies of the model:

```
codegenTask.UpdateThisModelReferenceTarget = 'IfOutOfDate';
```

See Also

`addTask` | `padv.builtin.task.AnalyzeModelCode` | `padv.builtin.task.RunCodeInspection` | `padv.builtin.query.FindCodeForModel` | `padv.ProcessModel` | Process Advisor | `runprocess`

padv.builtin.task.GenerateModelComparison Class

Namespace: `padv.builtin.task padv.builtin.task padv.builtin.task`
Superclasses: `padv.Task`

Task for generating model comparison report

Description

The `padv.builtin.task.GenerateModelComparison` class provides a task that can compare models in the project to their ancestors in Git and publish a comparison report using the Comparison Tool. The task compares your version of the model to either the latest or previous version on the main branch in Git:

- If you make a change to a model and run the task, the task compares your version of the model to either the head of the current branch or latest version on the main branch in Git.
- If you do not make changes to a model and then run the task, the task compares the model to the previous version available on the main branch in Git.

You can use the task properties to specify different report options, filtering options, and the name of the Git branch used for the comparison.

You can add the task to your process model by using the method `addTask`. After you add the task to your process model, you can run the task from the Process Advisor app or by using the function `runprocess`.

To view the source code for this built-in task, in the MATLAB Command Window, enter:

```
open padv.builtin.task.GenerateModelComparison
```

The `padv.builtin.task.GenerateModelComparison` class is a `handle` class.

Creation

Description

`task = padv.builtin.task.GenerateModelComparison()` creates a task for comparing models using the Comparison Tool.

`task = padv.builtin.task.GenerateModelComparison(Name=Value)` sets certain properties using one or more name-value arguments. For example, `task = padv.builtin.task.GenerateModelComparison(Name = "MyModelComparisonTask")` creates a task with the specified name.

You can use this syntax to set property values for `InputQueries`, `Name`, `IterationQuery`, `InputDependencyQuery`, `Licenses`, `LaunchToolAction`, and `LaunchToolText`.

The `padv.builtin.task.GenerateModelComparison` class also has other properties, but you cannot set those properties during task creation.

Properties

The `GenerateModelComparison` class inherits properties from `padv.Task`. The properties listed in "General Task Properties" on page 11-0 are `padv.Task` properties that the `GenerateModelComparison` task overrides.

The task also has properties for specifying:

- "Comparison Options" on page 11-0 for comparing models by using `visdiff`
- "Report Options" on page 11-0

General Task Properties

`Name` — Unique identifier for task in process
`"padv.builtin.task.GenerateModelComparison"` (default) | string

Unique identifier for task in process, specified as a string.

Example: `"MyModelDiffTask"`

Data Types: `string`

`Title` — Human-readable name that appears in Process Advisor app
`"Generate Model Comparison"` (default) | string

Human-readable name that appears in Process Advisor app, specified as a string.

Example: `"My Generate Model Comparison Task"`

Data Types: `string`

`DescriptionText` — Task description
`"This task uses the Model Comparison tool to generate a difference report with the previous version of the model."` (default) | string

Task description, specified as a string.

When you point to a task in Process Advisor and click the information icon, the tooltip shows the task description.

Example: `"This task uses the Model Comparison tool to generate a difference report with the previous version of the model."`

Data Types: `string`

`DescriptionCSH` — Path to task documentation
path to `GenerateModelComparison` documentation (default) | string

Path to task documentation, specified as a string.

When you point to a task in Process Advisor, click the ellipsis (**...**), and click **Help**, Process Advisor opens the task documentation.

Example: `fullfile(pwd,"taskHelpFiles","myTaskDocumentation.pdf")`

Data Types: `string`

`RequiredIterationArtifactType` — Artifact type that task can run on
`"sl_model_file"` (default) | string

Artifact type that the task can run on, specified as a string. The required iteration artifact type must be the artifact type supported by the `IterationQuery` property of the task.

For a list of valid artifact types, see “Valid Artifact Types” on page 9-2.

Data Types: `string`

`IterationQuery` — Find artifacts that task iterates over
`padv.builtin.query.FindModels` (default) | `padv.Query` object | name of `padv.Query` object

Query that finds the artifacts that the task iterates over, specified as a `padv.Query` object or the name of a `padv.Query` object. When you specify `IterationQuery`, the task runs one time *for each* artifact returned by the query. In the Process Advisor app, the artifacts returned by `IterationQuery` appear under task title.

For more information about task iterations, see "About the Process Model" in the User's Guide PDF.

`InputDependencyQuery` — Finds artifact dependencies for task inputs
`padv.Query` object | name of `padv.Query` object

Query that finds artifact dependencies for task inputs, specified as a `padv.Query` object or the name of a `padv.Query` object.

The build system runs the query specified by `InputDependencyQuery` to find the dependencies for the task inputs, since those dependencies can impact if task results are up-to-date.

For more information, see "About the Process Model" in the User's Guide PDF.

Example: `padv.builtin.query.GetDependentArtifacts`

`LaunchToolAction` — Function that launches tool
`@launchToolAction` (default) | function handle

Function that launches a tool, specified as the function handle.

When you point to a task in the Process Advisor app, you can click the ellipsis (**...**) to see more options. For built-in tasks, you have the option to launch a tool associated with the task.

For the task `GenerateModelComparison`, you can launch the Model Comparison tool.

Data Types: `function_handle`

`LaunchToolText` — Description of action that `LaunchToolAction` property performs
`"Compare to Ancestor"` (default) | string

Description of the action that the `LaunchToolAction` property performs, specified as a string.

Data Types: `string`

`InputQueries` — Inputs to task
`padv.Query` object | name of `padv.Query` object | array of `padv.Query` objects

Inputs to the task, specified as:

- a `padv.Query` object
- the name of `padv.Query` object

- an array of `padv.Query` objects
- an array of names of `padv.Query` objects

By default, the task `GenerateModelComparison` gets the current model that the task is iterating over by using the built-in query `padv.builtin.query.GetIterationArtifact`.

`OutputDirectory` — Location for standard task outputs
`fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$','model_comparison')` (default) | string

Location for standard task outputs, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Data Types: `string`

Comparison Options

`Filter` — Setting for filtering model comparison report
`"default"` (default) | `"unfiltered"`

Setting for filtering model comparison report, specified as either:

- `"unfiltered"` — Removes all filtering from the comparison.
- `"default"` — Default filtering for the comparison, which hides non-functional changes.

Example: `"unfiltered"`

`MainBranch` — Name of Git branch used for comparison
`"main"` (default) | string

Name of Git branch used for comparison, specified as a string.

Example: `"taskBranch"`

Data Types: `string`

Report Options

`ReportName` — Name of generated comparison report
`"$ITERATIONARTIFACT$_Model_Comparison"` (default) | string

Name of generated comparison report, specified as a string.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Example: `"myModel_Model_Comparison"`

Data Types: `string`

`ReportPath` — Path to generated comparison report
`fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$','model_comparison')` (default) | string

Path to generated comparison report, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Data Types: `string`

`ReportFormat` —
`"HTML"` (default) | `"DOCX"` | `"PDF"`

Format of generated comparison report, specified as either `"DOCX"`, `"HTML"`, or `"PDF"`.

Example: `"PDF"`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Generate a model comparison report using the Comparison Tool
	
	Note You do not need to manually invoke this method. When you run a task using the Process Advisor app or the `runprocess` function, the build system automatically invokes the `run` method for the task.
	
	The `run` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this built-in task, make sure to use the same method signature inside your custom task:
	
	`function taskResult = run(obj, input)`
	`  ...`
	`end`

`dryRun`	Dry-run the task to validate task inputs and generate representative task outputs without actually running the task.The `dryRun` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this class, make sure to use the same method signature inside your custom task:
	`function taskResult = dryRun(obj, input)`
	`    ...`
	`end`

`launchToolAction`	Launch the Comparison Tool. Process Advisor uses this method when you open the tool associated with a task.

Examples

Add Model Comparison Task to Process

Add a task that can generate a model comparison report using the Comparison Tool.

Open the process model for your project. If you do not have a process model, open the Process Advisor app to automatically create a process model.

In the process model file, add the `GenerateModelComparison` task to your process model by using the `addTask` method.

```
mdlCompTask = pm.addTask(padv.builtin.task.GenerateModelComparison);
```

You can reconfigure the task behavior by using the task properties. For example, to use a different branch for the comparison:

```
mdlCompTask.MainBranch = "branchname";
```

Tips

- To find and compare model ancestors, this task requires that you use Git source control for your project. For information on how to add a project to Git source control, see “Add a Project to Source Control”.
- If you run MATLAB using the `-nodisplay` option or you use a machine that does not have a display (like many CI runners and Docker containers), you should set up a virtual display server before you include this task in your process model. For information, see "Set Up Virtual Display for No-Display Machine" in the User's Guide.

See Also
`addTask` | `padv.ProcessModel` | Process Advisor | `runprocess` | `visdiff`

Topics
“Review Changes in Simulink Models”

padv.builtin.task.GenerateSDDReport Class

Namespace: `padv.builtin.task padv.builtin.task padv.builtin.task`
Superclasses: `padv.Task`

Task for generating a System Design Description (SDD) report

Description

The `padv.builtin.task.GenerateSDDReport` class provides a task that can generate a System Design Description (SDD) report from a predefined template using Simulink Report Generator. The System Design Description report provides a summary or detailed information about a system design represented by a model.

You can add the task to your process model by using the method `addTask`. After you add the task to your process model, you can run the task from the Process Advisor app or by using the function `runprocess`.

To view the source code for this built-in task, in the MATLAB Command Window, enter:

```
open padv.builtin.task.GenerateSDDReport
```

The `padv.builtin.task.GenerateSDDReport` class is a `handle` class.

Creation

Description

`task = padv.builtin.task.GenerateSDDReport()` creates a task for generating a System Design Description (SDD) report using Simulink Report Generator.

`task = padv.builtin.task.GenerateSDDReport(Name=Value)` sets certain properties using one or more name-value arguments. For example, `task = padv.builtin.task.GenerateSDDReport(Name = "MySDDReportTask")` creates a task with the specified name.

You can use this syntax to set property values for `InputQueries`, `Name`, `IterationQuery`, `InputDependencyQuery`, `Licenses`, `LaunchToolAction`, and `LaunchToolText`.

The `padv.builtin.task.GenerateSDDReport` class also has other properties, but you cannot set those properties during task creation.

Properties

The `GenerateSDDReport` class inherits properties from `padv.Task`. The properties listed in “Specialized Inherited Properties” on page 11-0 are `padv.Task` properties that the `GenerateSDDReport` task overrides.

The task also has properties for specifying “SDD Report Options” on page 11-0 for specifying the report options for an SDD object.

Specialized Inherited Properties

`Name` — Unique identifier for task in process
`"padv.builtin.task.GenerateSDDReport"` (default) | string

Unique identifier for task in process, specified as a string.

Example: `"MyGenerateSDDReportTask"`

Data Types: `string`

`Title` — Human-readable name that appears in Process Advisor app
`"Generate SDD Report"` (default) | string

Human-readable name that appears in Process Advisor app, specified as a string.

Example: `"My Generate SDD Report Task"`

Data Types: `string`

`DescriptionText` — Task description
`"This task uses Simulink Report Generator to create a System Design Description report for your models."` (default) | string

Task description, specified as a string.

When you point to a task in Process Advisor and click the information icon, the tooltip shows the task description.

Example: `"This task uses Simulink Report Generator to create a System Design Description report for your models."`

Data Types: `string`

`DescriptionCSH` — Path to task documentation
path to `GenerateSDDReport` documentation (default) | string

Path to task documentation, specified as a string.

When you point to a task in Process Advisor, click the ellipsis (**...**), and click **Help**, Process Advisor opens the task documentation.

Example: `fullfile(pwd,"taskHelpFiles","myTaskDocumentation.pdf")`

Data Types: `string`

`RequiredIterationArtifactType` — Artifact type that task can run on
`"sl_model_file"` (default) | string

Artifact type that the task can run on, specified as a string. The required iteration artifact type must be the artifact type supported by the `IterationQuery` property of the task.

For a list of valid artifact types, see “Valid Artifact Types” on page 9-2.

Data Types: `string`

`IterationQuery` — Find artifacts that task iterates over
`padv.builtin.query.FindModels` (default) | `padv.Query` object | name of `padv.Query` object

Query that finds the artifacts that the task iterates over, specified as a `padv.Query` object or the name of a `padv.Query` object. When you specify `IterationQuery`, the task runs one time *for each* artifact returned by the query. In the Process Advisor app, the artifacts returned by `IterationQuery` appear under task title.

For more information about task iterations, see "About the Process Model" in the User's Guide PDF.

`InputDependencyQuery` — Finds artifact dependencies for task inputs
`padv.Query` object | name of `padv.Query` object

Query that finds artifact dependencies for task inputs, specified as a `padv.Query` object or the name of a `padv.Query` object.

The build system runs the query specified by `InputDependencyQuery` to find the dependencies for the task inputs, since those dependencies can impact if task results are up-to-date.

For more information, see "About the Process Model" in the User's Guide PDF.

Example: `padv.builtin.query.GetDependentArtifacts`

`Licenses` — List of licenses that task requires
`["matlab_report_gen" "simulink_report_gen"]` (default) | string

List of licenses that the task requires, specified as a string.

Data Types: `string`

`LaunchToolAction` — Function that launches tool
`@launchToolAction` (default) | function handle

Function that launches a tool, specified as the function handle.

When you point to a task in the Process Advisor app, you can click the ellipsis (**...**) to see more options. For built-in tasks, you have the option to launch a tool associated with the task.

For the task `GenerateSDDReport`, you can launch a Report Options dialog.

Data Types: `function_handle`

`LaunchToolText` — Description of action that `LaunchToolAction` property performs
`"Open SDD Report Options"` (default) | string

Description of the action that the `LaunchToolAction` property performs, specified as a string.

Data Types: `string`

`InputQueries` — Inputs to task
`padv.Query` object | name of `padv.Query` object | array of `padv.Query` objects

Inputs to the task, specified as:

- a `padv.Query` object
- the name of `padv.Query` object
- an array of `padv.Query` objects
- an array of names of `padv.Query` objects

By default, the task GenerateSDDReport gets the current model that the task is iterating over by using the built-in query padv.builtin.query.GetIterationArtifact.

OutputDirectory — Location for standard task outputs
fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$', 'system_design_description') (default) | string

Location for standard task outputs, specified as a string.

The built-in tasks use tokens, like $DEFAULTOUTPUTDIR$, as placeholders for dynamic path resolution during run-time. For information on the tokens, see "Dynamically Resolve Paths Using Tokens" on page 10-2.

Data Types: string

SDD Report Options

DisplayReport — Open generated report
false or 0 (default) | true or 1

Open the generated report, specified as a numeric or logical 1 (true) or 0 (false).

Example: true

Data Types: logical

IncludeCustomLibraries — Include custom libraries in design description
false or 0 (default) | true or 1

Include custom libraries in the design description, specified as a numeric or logical 1 (true) or 0 (false).

Example: true

Data Types: logical

IncludeDetails — Include design details in design description
true or 1 (default) | false or 0

Include design details, like block parameters, in the design description, specified as a numeric or logical 1 (true) or 0 (false).

Example: false

Data Types: logical

IncludeGlossary — Include glossary in design description
true or 1 (default) | false or 0

Include a glossary in the design description, specified as a numeric or logical 1 (true) or 0 (false).

Example: false

Data Types: logical

IncludeLookupTables — Include lookup tables in design description
true or 1 (default) | false or 0

Include lookup tables in the design description, specified as a numeric or logical 1 (true) or 0 (false).

Example: `false`

Data Types: `logical`

`IncludeModelRefs` — Include model references in design description
`false` or `0` (default) | `true` or `1`

Include model references in the design description, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`IncludeRequirementsLinks` — Include requirement links in design description
`true` or `1` (default) | `false` or `0`

Include requirement links in the design description, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`IncrOutputName` — Increment report name to avoid overwriting existing report
`false` or `0` (default) | `true` or `1`

Increment the report name to avoid overwriting an existing report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`LegalNotice` — Legal notice that appears on report
`"For Internal Distribution Only"` (default) | string

Legal notice that appears on the report, specified as a string.

Example: `"Confidential"`

Data Types: `string`

`PackageType` — File packaging type for HTML reports
`1` (default) | `2` | `3`

File packaging type for HTML reports, specified as either:

- `1` — Zipped. Package report files in a single compressed file that has the report name, with a `.zip` extension.
- `2` — Unzipped. Generate the report files in a subfolder of the current folder. The subfolder has the report name.
- `3` — Both zipped and unzipped. Package the report files as both zipped and unzipped.

Note that this parameter is only enabled when `ReportFormat` is `"html"`.

Example: `2`

`ReportFormat` — Output format for generated report
`"html"` (default) | `"pdf"` | `"docx"`

Output format for the generated report, specified as either:

- `"html"` — HTML format. You can use the property `PackageType` to specify whether report files are zipped, unzipped, or produce both zipped and unzipped files.
- `"pdf"` — PDF format
- `"docx"` — Microsoft Word document format

Example: `"pdf"`

`ReportName` — File name for generated report
`"$ITERATIONARTIFACT$_SDD"` (default) | string

File name for the generated report, specified as a string.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see "Dynamically Resolve Paths Using Tokens" on page 10-2.

Example: `"mySDDReport"`

Data Types: `string`

`ReportPath` — Path to generated report
`fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$', 'system_design_description')` (default) | string

Path to the generated report, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see "Dynamically Resolve Paths Using Tokens" on page 10-2.

Data Types: `string`

`ReportTitle` — Title of report
`""` (default) | string

Title of the report, specified as a string.

Data Types: `string`

`TitleImgPath` — Path of image that appears on report title page
`""` (default) | string

Path of image that appears on report title page, specified as a string.

Data Types: `string`

`Subtitle` — Subtitle of report
`"Design Description"` (default) | string

Subtitle of the report, specified as a string.

Data Types: `string`

`TimeFormat` — (unused) Date and time format for report creation date
`""` (default)

The SDD report does not use this property.

`UseStatusWindow` — Display report generation status messages in separate window
`false` or `0` (default) | `true` or `1`

Display report generation status messages in separate window, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Generate a System Design Description (SDD) report using Simulink Report Generator
	
	Note You do not need to manually invoke this method. When you run a task using the Process Advisor app or the `runprocess` function, the build system automatically invokes the `run` method for the task.
	
	The `run` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this built-in task, make sure to use the same method signature inside your custom task:
	
	`function taskResult = run(obj, input)`
	`  ...`
	`end`

`dryRun`	Dry-run the task to validate task inputs and generate representative task outputs without actually running the task.The `dryRun` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this class, make sure to use the same method signature inside your custom task:
	`function taskResult = dryRun(obj, input)`
	`    ...`
	`end`

`launchToolAction`	Launch Report Options dialog. Process Advisor uses this method when you open the tool associated with a task.

Examples

Add SDD Report Generation Task to Process

Add a task that can generate an SDD report for the models in your project.

Open the process model for your project. If you do not have a process model, open the Process Advisor app to automatically create a process model.

In the process model file, add the `GenerateSDDReport` task to your process model by calling the `addTask` method on the `padv.ProcessModel` object `pm`.

```
sddTask = pm.addTask(padv.builtin.task.GenerateSDDReport);
```

You can reconfigure the task behavior by using the task properties. For example, to generate a PDF instead of HTML, set the task property `ReportFormat` to `"pdf"`.

```
sddTask.ReportFormat = "pdf";
```

See Also

`addTask` | `padv.ProcessModel` | Process Advisor | `runprocess`

Topics

"System Design Description" (Simulink Report Generator)

padv.builtin.task.GenerateSimulinkWebView Class

Namespace: `padv.builtin.task padv.builtin.task padv.builtin.task`
Superclasses: `padv.Task`

Task for creating web views for models

Description

The `padv.builtin.task.GenerateSimulinkWebView` class provides a task that can create web views for your models using Simulink Report Generator. You can view, navigate, and share a web view without a Simulink license.

You can add the task to your process model by using the method `addTask`. After you add the task to your process model, you can run the task from the Process Advisor app or by using the function `runprocess`.

To view the source code for this built-in task, in the MATLAB Command Window, enter:

```
open padv.builtin.task.GenerateSimulinkWebView
```

The `padv.builtin.task.GenerateSimulinkWebView` class is a `handle` class.

Creation

Description

`task = padv.builtin.task.GenerateSimulinkWebView()` creates a task for creating web views using Simulink Report Generator.

`task = padv.builtin.task.GenerateSimulinkWebView(Name=Value)` sets certain properties using one or more name-value arguments. For example, `task = padv.builtin.task.GenerateSimulinkWebView(Name = "MyWebViewTask")` creates a task with the specified name.

You can use this syntax to set property values for `InputQueries`, `Name`, `IterationQuery`, `InputDependencyQuery`, `Licenses`, `LaunchToolAction`, and `LaunchToolText`.

The `padv.builtin.task.GenerateSimulinkWebView` class also has other properties, but you cannot set those properties during task creation.

Properties

The `GenerateSimulinkWebView` class inherits properties from `padv.Task`. The properties listed in “Specialized Inherited Properties” on page 11-0 are `padv.Task` properties that the `GenerateSimulinkWebView` task overrides.

The task also has properties for specifying “Web View Options” on page 11-0 for exporting Simulink models to web views by using `slwebview`.

Specialized Inherited Properties

Name — Unique identifier for task in process
"padv.builtin.task.GenerateSimulinkWebView" (default) | string

Unique identifier for task in process, specified as a string.

Example: "MyWebViewTask"

Data Types: string

Title — Human-readable name that appears in Process Advisor app
"Generate Simulink Web View" (default) | string

Human-readable name that appears in Process Advisor app, specified as a string.

Example: "My Web View Task"

Data Types: string

DescriptionText — Task description
"This task uses Simulink Report Generator to create a web view for your models." (default) | string

Task description, specified as a string.

When you point to a task in Process Advisor and click the information icon, the tooltip shows the task description.

Example: "This task uses Simulink Report Generator to create a web view for your models."

Data Types: string

DescriptionCSH — Path to task documentation
path to GenerateSimulinkWebView documentation (default) | string

Path to task documentation, specified as a string.

When you point to a task in Process Advisor, click the ellipsis (**...**), and click **Help**, Process Advisor opens the task documentation.

Example: fullfile(pwd,"taskHelpFiles","myTaskDocumentation.pdf")

Data Types: string

RequiredIterationArtifactType — Artifact type that task can run on
"sl_model_file" (default) | string

Artifact type that the task can run on, specified as a string. The required iteration artifact type must be the artifact type supported by the IterationQuery property of the task.

For a list of valid artifact types, see “Valid Artifact Types” on page 9-2.

Data Types: string

IterationQuery — Find artifacts that task iterates over
padv.builtin.query.FindModels (default) | padv.Query object | name of padv.Query object

Query that finds the artifacts that the task iterates over, specified as a `padv.Query` object or the name of a `padv.Query` object. When you specify `IterationQuery`, the task runs one time *for each* artifact returned by the query. In the Process Advisor app, the artifacts returned by `IterationQuery` appear under task title.

For more information about task iterations, see "About the Process Model" in the User's Guide PDF.

`InputDependencyQuery` — Finds artifact dependencies for task inputs
`padv.Query` object | name of `padv.Query` object

Query that finds artifact dependencies for task inputs, specified as a `padv.Query` object or the name of a `padv.Query` object.

The build system runs the query specified by `InputDependencyQuery` to find the dependencies for the task inputs, since those dependencies can impact if task results are up-to-date.

For more information, see "About the Process Model" in the User's Guide PDF.

Example: `padv.builtin.query.GetDependentArtifacts`

`Licenses` — List of licenses that task requires
`["matlab_report_gen" "simulink_report_gen"]` (default) | string

List of licenses that the task requires, specified as a string.

Data Types: `string`

`LaunchToolAction` — Function that launches tool
`@launchToolAction` (default) | function handle

Function that launches a tool, specified as the function handle.

When you point to a task in the Process Advisor app, you can click the ellipsis (**...**) to see more options. For built-in tasks, you have the option to launch a tool associated with the task.

For the task `GenerateSimulinkWebView`, you can launch a web view options dialog.

Data Types: `function_handle`

`LaunchToolText` — Description of action that `LaunchToolAction` property performs
`"Open Web View Options"` (default) | string

Description of the action that the `LaunchToolAction` property performs, specified as a string.

Data Types: `string`

`InputQueries` — Inputs to task
`padv.Query` object | name of `padv.Query` object | array of `padv.Query` objects

Inputs to the task, specified as:

- a `padv.Query` object
- the name of `padv.Query` object
- an array of `padv.Query` objects
- an array of names of `padv.Query` objects

By default, the task `GenerateSimulinkWebView` gets the current model that the task is iterating over by using the built-in query `padv.builtin.query.GetIterationArtifact`.

`OutputDirectory` — Location for standard task outputs
`fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$', 'webview')` (default) | string

Location for standard task outputs, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see "Dynamically Resolve Paths Using Tokens" on page 10-2.

Data Types: `string`

Web View Options

`FollowLinks` — Follow links into library blocks
`1` (default) | `0`

Follow links into library blocks, specified as either:

- `0` — Does not allow you to follow links into library blocks in a web view
- `1` — Allows you to follow links into library blocks in a web view

Example: `0`

`FollowModelReference` — Access referenced models in web view
`1` (default) | `0`

Access referenced models in a web view, specified as either:

- `0` — Does not allow you to access referenced models in a web view
- `1` — Allows you to access referenced models in a web view

Example: `0`

`IncludeNotes` — Include user notes in web view
`true` or `1` (default) | `false` or `0`

Include user notes in web view, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`IncrementalExport` — Export models incrementally
`false` or `0` (default) | `true` or `1`

Starting in R2022b, export models incrementally, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`LookUnderMasks` — Export ability to interact with masked blocks
`"All"` (default) | `"None"`

Export the ability to interact with masked blocks, specified as either `"None"` or `"All"`.

Example: `"None"`

`PackagingType` — Type of web view output package
`"unzipped"` (default) | `"zipped"` | `"both"`

Type of web view output package, specified as `"zipped"`, `"unzipped"`, or `"both"`.

Example: `"zipped"`

`RecurseFolder` — Export models in subfolders
`false` or `0` (default) | `true` or `1`

Export models in subfolders, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`ReportName` — File name for generated report
`"$ITERATIONARTIFACT$_webview"` (default) | string

File name for the generated report, specified as a string.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Example: `"myModel_webview"`

Data Types: `string`

`ReportPath` — Path to generated report
`fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$', 'webview')` (default) | string

Path to the generated report, specified as a string.

Data Types: `string`

`SearchScope` — Systems to export
`"All"` (default) | `"CurrentAndBelow"` | `"CurrentAndAbove"` | `"Current"`

Systems to export, relative to the `system_name` system, specified as `"All"`, `"CurrentAndBelow"`, `"CurrentAndAbove"`, or `"Current"`.

Example: `"Current"`

`ShowProgressBar` — Display status bar when exporting web view
`false` or `0` (default) | `true` or `1`

Display the status bar when you export a web view, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`ViewFile` — Display exported web view in web browser
`false` or `0` (default) | `true` or `1`

Display the web view in a web browser when you export the web view, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Create web views using Simulink Report Generator
	
	Note You do not need to manually invoke this method. When you run a task using the Process Advisor app or the `runprocess` function, the build system automatically invokes the `run` method for the task.
	
	The `run` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this built-in task, make sure to use the same method signature inside your custom task:
	
	`function taskResult = run(obj, input)`
	`   ...`
	`end`

`dryRun`	Dry-run the task to validate task inputs and generate representative task outputs without actually running the task.The `dryRun` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this class, make sure to use the same method signature inside your custom task:
	
	`function taskResult = dryRun(obj, input)`
	`    ...`
	`end`

`launchToolAction`	Launch web view options dialog. Process Advisor uses this method when you open the tool associated with a task.

Examples

Add Web View Task to Process

Add a task that can create web views for the models in your project.

Open the process model for your project. If you do not have a process model, open the Process Advisor app to automatically create a process model.

In the process model file, add the `GenerateSimulinkWebView` task to your process model by using the `addTask` method.

```
slwebTask = pm.addTask(padv.builtin.task.GenerateSimulinkWebView);
```

You can reconfigure the task behavior by using the task properties. For example, to have the task not follow links into library blocks:

```
slwebTask.FollowLinks = false;
```

Tips

- If you run MATLAB using the `-nodisplay` option or you use a machine that does not have a display (like many CI runners and Docker containers), you should set up a virtual display server before you include this task in your process model. For information, see "Set Up Virtual Display for No-Display Machine" in the User's Guide.

padv.builtin.task.MergeTestResults Class

Namespace: `padv.builtin.task padv.builtin.task padv.builtin.task`
Superclasses: `padv.Task`

Task for generating consolidated test results report and merged coverage reports

Description

The `padv.builtin.task.MergeTestResults` class provides a task that can generate a consolidated test results report and merged coverage reports using Simulink Test and Simulink Coverage™. The task can generate the following artifacts for a model:

- a consolidated test results report
- a merged model coverage report for normal mode simulation results
- a merged code coverage report for software-in-the-loop (SIL) mode results
- a merged code coverage report for processor-in-the-loop (PIL) mode results

You can run your tests using the built-in task `padv.builtin.task.RunTestsPerTestCase` and then generate the reports using the `MergeTestResults` task. You can add these tasks to your process model by using the method `addTask`. After you add the tasks to your process model, you can run the tasks from the Process Advisor app or by using the function `runprocess`.

Alternatively, you can run your tests using the built-in task `padv.builtin.task.RunTestsPerModel`, but to generate the consolidated test results report and merged coverage report you need to reconfigure the `MergeTestResults` task.

To view the source code for this built-in task, in the MATLAB Command Window, enter:

```
open padv.builtin.task.MergeTestResults
```

The `padv.builtin.task.MergeTestResults` class is a `handle` class.

Creation

Description

`task = padv.builtin.task.MergeTestResults()` creates a task for generating a consolidated test results report and merged coverage reports using Simulink Test and Simulink Coverage.

`task = padv.builtin.task.MergeTestResults(Name=Value)` sets certain properties using one or more name-value arguments. For example, `task = padv.builtin.task.MergeTestResults(Name = "MyTestAndCoverageReportsTask")` creates a task with the specified name.

You can use this syntax to set property values for `Name`, `Title`, `IterationQuery`, `InputQueries`, `InputDependencyQuery`, or `Licenses`.

The `padv.builtin.task.MergeTestResults` class also has other properties, but you cannot set those properties during task creation.

Properties

The `MergeTestResults` class inherits properties from `padv.Task`. The properties listed in "Specialized Inherited Properties" on page 11-0 are `padv.Task` properties that the `MergeTestResults` task overrides.

The task also has properties for specifying:

- "Test Result Options" on page 11-0
- "Coverage Report Options" on page 11-0

Specialized Inherited Properties

`Name` — Unique identifier for task in process

`"padv.builtin.task.MergeTestResults"` (default) | string

Unique identifier for task in process, specified as a string.

Example: `"MyTestAndCoverageReportsTask"`

Data Types: `string`

`Title` — Human-readable name that appears in Process Advisor app

`"Merge Test Results"` (default) | string

Human-readable name that appears in Process Advisor app, specified as a string.

Example: `"My Test And Coverage Reports Task"`

Data Types: `string`

`DescriptionText` — Task description

`"This task uses Simulink Test and Simulink Coverage to generate a consolidated test results report and a merged coverage report for a model."` (default) | string

Task description, specified as a string.

When you point to a task in Process Advisor and click the information icon, the tooltip shows the task description.

Example: `"This task uses Simulink Test and Simulink Coverage to generate a consolidated test results report and a merged coverage report for a model."`

Data Types: `string`

`DescriptionCSH` — Path to task documentation

path to `MergeTestResults` documentation (default) | string

Path to task documentation, specified as a string.

When you point to a task in Process Advisor, click the ellipsis (**...**), and click **Help**, Process Advisor opens the task documentation.

Example: `fullfile(pwd,"taskHelpFiles","myTaskDocumentation.pdf")`

Data Types: `string`

`RequiredIterationArtifactType` — Artifact type that task can run on
`"sl_model_file"` (default) | string

Artifact type that the task can run on, specified as a string. The required iteration artifact type must be the artifact type supported by the `IterationQuery` property of the task.

For a list of valid artifact types, see “Valid Artifact Types” on page 9-2.

Data Types: `string`

`IterationQuery` — Find artifacts that task iterates over
`padv.builtin.query.FindModelsWithTestCases` (default) | `padv.Query` object | name of `padv.Query` object

Query that finds the artifacts that the task iterates over, specified as a `padv.Query` object or the name of a `padv.Query` object. When you specify `IterationQuery`, the task runs one time *for each* artifact returned by the query. In the Process Advisor app, the artifacts returned by `IterationQuery` appear under task title.

For more information about task iterations, see "About the Process Model" in the User's Guide PDF.

`InputDependencyQuery` — Finds artifact dependencies for task inputs
`padv.Query` object | name of `padv.Query` object

Query that finds artifact dependencies for task inputs, specified as a `padv.Query` object or the name of a `padv.Query` object.

The build system runs the query specified by `InputDependencyQuery` to find the dependencies for the task inputs, since those dependencies can impact if task results are up-to-date.

For more information, see "About the Process Model" in the User's Guide PDF.

Example: `padv.builtin.query.GetDependentArtifacts`

`Licenses` — List of licenses that task requires
`"simulink_test"` (default) | string

List of licenses that the task requires, specified as a string.

Data Types: `string`

`InputQueries` — Inputs to task
`padv.Query` object | name of `padv.Query` object | array of `padv.Query` objects

Inputs to the task, specified as:

- a `padv.Query` object
- the name of `padv.Query` object
- an array of `padv.Query` objects
- an array of names of `padv.Query` objects

By default, the task `MergeTestResults` finds the models with test cases and the associated test results by using the built-in queries:

- `padv.builtin.query.GetIterationArtifact`
- `padv.builtin.query.GetOutputsOfDependentTask` on the task `padv.builtin.task.RunTestsPerTestCase`

`OutputDirectory` — Location for standard task outputs
`fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$' , 'test_results')` (default) | string

Location for standard task outputs, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see "Dynamically Resolve Paths Using Tokens" on page 10-2.

Data Types: `string`

Test Result Options

`Author` — Name of report author
`"Process Advisor"` (default) | string

Name of the report author, specified as a string.

Example: `"My Team Name"`

Data Types: `string`

`IncludeComparisonSignalPlots` — Include signal comparison plots
`false` or `0` (default) | `true` or `1`

Include the signal comparison plots defined under baseline criteria, equivalence criteria, or assessments using the verify operator in the test case, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`IncludeCoverageResult` — Include coverage metrics collected at test execution
`true` or `1` (default) | `false` or `0`

Include coverage metrics that are collected at test execution, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`IncludeErrorMessages` — Include error messages from test case simulations
`true` or `1` (default) | `false` or `0`

Include error messages from the test case simulations, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`IncludeMATLABFigures` — Include figures in report
`false` or `0` (default) | `true` or `1`

Include the figures opened from a callback script, custom criteria, or by the model in the report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`IncludeMLVersion` — Include MATLAB version that ran test cases
`true` or `1` (default) | `false` or `0`

Include the version of MATLAB used to run the test cases, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types:

`IncludeSimulationMetadata` — Include simulation metadata for each test case or iteration
`false` or `0` (default) | `true` or `1`

Include simulation metadata for each test case or iteration, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`IncludeSimulationSignalPlots` — Include simulation output plots of each signal
`false` or `0` (default) | `true` or `1`

Include the simulation output plots of each signal, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`IncludeTestRequirement` — Include test requirement link
`true` or `1` (default) | `false` or `0`

Include the test requirement link defined under Requirements in the test case, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`IncludeTestResults` — Include all or subset of test results in report
`0` (default) | `1` | `2`

Include all or a subset of test results in the report, specified as either:

- `0` — Passed and failed results
- `1` — Only passed results
- `2` — Only failed results

Example: 2

`LaunchReport` — Open generated report
`false` or `0` (default) | `true` or `1`

Open the generated report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`LoadSimulationSignalData` — Task loads simulation signal data when loading test results
`false` or `0` (default) | `true` or `1`

Task loads simulation signal data when loading test results, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`NumPlotColumnsPerPage` — Number of columns of plots to include on report pages
`1` (default) | `2` | `3` | `4`

Number of columns of plots to include on report pages, specified as an integer `1`, `2`, `3`, or `4`.

Example: 2

`NumPlotRowsPerPage` — Number of rows of plots to include on report pages
`2` (default) | `1` | `3` | `4`

Number of rows of plots to include on report pages, specified as an integer `1`, `2`, `3`, or `4`.

Example: 1

`ReportFormat` — Output format for generated report
`"pdf"` (default) | `"docx"` | `"zip"`

Output format for the generated report, specified as either:

- `"pdf"` — PDF format
- `"docx"` — Microsoft Word document format
- `"zip"` — Zipped file

Example: `"zip"`

`ReportPath` — Path to generated report
`fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$' , 'test_results')` (default) | string

Path to the generated report, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see "Dynamically Resolve Paths Using Tokens" on page 10-2.

Data Types: `string`

`ReportName` — File name for generated report
`"$ITERATIONARTIFACT$_Test_Report"` (default) | string

File name for the generated report, specified as a string.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see "Dynamically Resolve Paths Using Tokens" on page 10-2.

Data Types: `string`

`ReportTitle` — Title of report
`"$ITERATIONARTIFACT$ TEST REPORT"` (default) | string

Title of the report, specified as a string.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see "Dynamically Resolve Paths Using Tokens" on page 10-2.

Data Types: `string`

Coverage Report Options

`CovAllTestInMdlSumm` — Include each test in model summary
`false` or `0` (default) | `true` or `1`

Include each test in the model summary, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`CovBarGrInMdlSumm` — Produce bar graphs in model summary
`true` or `1` (default) | `false` or `0`

Produce bar graphs in the model summary, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`CovComplexInBlkTable` — Include cyclomatic complexity numbers in block details
`true` or `1` (default) | `false` or `0`

Include cyclomatic complexity numbers in block details, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`CovComplexInSumm` — Include cyclomatic complexity numbers in summary
`true` or `1` (default) | `false` or `0`

Include cyclomatic complexity numbers in summary, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`CovElimFullCov` — Exclude fully covered model objects from report
`false` or `0` (default) | `true` or `1`

Exclude fully covered model objects from report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`CovElimFullCovDetails` — Exclude fully covered model object details from report
`true` or `1` (default) | `false` or `0`

Exclude fully covered model object details from report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`CovFiltExecMetric` — Filter Execution metric from report
`false` or `0` (default) | `true` or `1`

Filter Execution metric from report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`CovFiltSFEvent` — Filter Stateflow events from report
`false` or `0` (default) | `true` or `1`

Filter Stateflow events from report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`CovGenerateWebViewReport` — Generate web view report
`false` or `0` (default) | `true` or `1`

Generate web view report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`CovHitCntInMdlSumm` — Display hit/count ratio in model summary
`false` or `0` (default) | `true` or `1`

Display hit/count ratio in the model summary, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`CovReportName` — Name of generated model coverage report
`"$ITERATIONARTIFACT$_ModelCoverage_Report.html"` (default) | string

Name of generated model coverage report, specified as a string. The report is an aggregated coverage report for normal simulation mode results.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Example: `"myModel_NormalModelCoverage_Report.html"`

Data Types: `string`

`CovReportNameSIL` — Name of generated SIL code coverage report
`"$ITERATIONARTIFACT$_SIL_CodeCoverage_Report.html"` (default) | string

Name of generated software-in-the-loop (SIL) code coverage report, specified as a string. The report is an aggregated coverage report for SIL mode results.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Example: `"myModel_SIL_CodeCoverage_Report.html"`

Data Types: `string`

`CovReportNamePIL` — Name of generated (PIL) code coverage report
`"$ITERATIONARTIFACT$_PIL_CodeCoverage_Report.html"` (default) | string

Name of generated processor-in-the-loop (PIL) code coverage report, specified as a string. The report is an aggregated coverage report for PIL mode results.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Example: `"myModel_PIL_CodeCoverage_Report.html"`

Data Types: `string`

`CovShowReport` — Show coverage report
`false` or `0` (default) | `true` or `1`

Show coverage report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`CovTwoColorBarGraphs` — Use two-color bar graphs
`true` or `1` (default) | `false` or `0`

Use two-color bar graphs, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Generate a consolidated test results report and merged coverage reports using Simulink Test and Simulink Coverage
	
	Note You do not need to manually invoke this method. When you run a task using the Process Advisor app or the `runprocess` function, the build system automatically invokes the `run` method for the task.
	
	The `run` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this built-in task, make sure to use the same method signature inside your custom task:
	
	`function taskResult = run(obj, input)`
	`  ...`
	`end`

`dryRun`	Dry-run the task to validate task inputs and generate representative task outputs without actually running the task.The `dryRun` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this class, make sure to use the same method signature inside your custom task:
	
	`function taskResult = dryRun(obj, input)`
	`    ...`
	`end`

Examples

Add Merge Test Results Task to Process

Add a task that can generate a consolidated test results report and merged coverage reports for models in your project.

Open the process model for your project. If you do not have a process model, open the Process Advisor app to automatically create a process model.

In the process model file, add the `GenerateSimulinkWebView` task to your process model by using the `addTask` method.

```
mergeTestTask = pm.addTask(padv.builtin.task.MergeTestResults);
```

You can reconfigure the task behavior by using the task properties. For example, to change where the consolidated test results report and merged model coverage report generate:

```
defaultTestResultPath = fullfile('$DEFAULTOUTPUTDIR$','test_results');
mergeTestTask.ReportPath = defaultTestResultPath;
mergeTestTask.CovReportPath = defaultTestResultPath;
```

The `MergeTestResults` task requires outputs from the `RunTestsPerTestCase` task. Specify this dependency in your process model by using the `dependsOn` method.

To make sure that you run your tasks using the built-in task `RunTestsPerTestCase` before you add the `MergeTestResults` task to the process model, you can use conditional logic in your process model. For example:

```
includeTestsPerTestCaseTask = true;
includeMergeTestResultsTask = true;

%% Run tests per test case
% Tools required: Simulink Test
if includeTestsPerTestCaseTask
    milTask = pm.addTask(padv.builtin.task.RunTestsPerTestCase);
    % ... Optionally specify task property values
end

%% Merge test results
% Tools required: Simulink Test (and optionally Simulink Coverage)
if includeTestsPerTestCaseTask && includeMergeTestResultsTask
    mergeTestTask = pm.addTask(padv.builtin.task.MergeTestResults);
    % ... Optionally specify task property values
end

% Set task dependencies
if includeTestsPerTestCaseTask && includeMergeTestResultsTask
    mergeTestTask.dependsOn(milTask,WhenStatus=["Pass","Fail"]);
end
```

This code specifies that the `MergeTestResults` task runs when the status of the `RunTestsPerTestCase` task is either a passing or failing result. If you only want to run the `MergeTestResults` when the `RunTestsPerTestCase` task passes, you can specify `WhenStatus` as `"Pass"` instead. For more information, see `dependsOn`.

Tips

- Run your tests using the built-in task `padv.builtin.task.RunTestsPerTestCase`.

padv.builtin.task.RunCodeInspection Class

Namespace: `padv.builtin.task padv.builtin.task padv.builtin.task`
Superclasses: `padv.Task`

Task for inspecting generated model code using Simulink Code Inspector

Description

The `padv.builtin.task.RunCodeInspection` class provides a task that can detect unintended functionality in your models by establishing model-to-code and code-to-model traceability using Simulink Code Inspector. The results of this task can help you to satisfy code-review objectives in DO-178 and other high-integrity standards.

You can add the task to your process model by using the method `addTask`. After you add the task to your process model, you can run the task from the Process Advisor app or by using the function `runprocess`.

To view the source code for this built-in task, in the MATLAB Command Window, enter:

```
open padv.builtin.task.RunCodeInspection
```

The `padv.builtin.task.RunCodeInspection` class is a `handle` class.

Note This task is not supported on macOS.

Creation

Description

`task = padv.builtin.task.RunCodeInspection()` creates a task for detecting unintended functionality in models using Simulink Code Inspector.

`task = padv.builtin.task.RunCodeInspection(Name=Value)` sets certain properties using one or more name-value arguments. For example, `task = padv.builtin.task.RunCodeInspection(Name = "MyCodeInspectionTask")` creates a task with the specified name.

You can use this syntax to set property values for `IsTopModel`, `ReportFolder`, `Name`, `Title`, `IterationQuery`, `InputDependencyQuery`, `InputQueries`, `LaunchToolAction`, and `LaunchToolText`.

The `padv.builtin.task.RunCodeInspection` class also has other properties, but you cannot set those properties during task creation.

Properties

The RunCodeInspection class inherits properties from padv.Task. The properties listed in "Specialized Inherited Properties" on page 11-0 are padv.Task properties that the RunCodeInspection task overrides.

The task also has properties for specifying "Code Inspection Options" on page 11-0 for creating a code inspection object slci.Configuration.

Specialized Inherited Properties

Name — Unique identifier for task in process
"padv.builtin.task.RunCodeInspection" (default) | string

Unique identifier for task in process, specified as a string.

Example: "MyCodeInspectionTask"

Data Types: string

Title — Human-readable name that appears in Process Advisor app
"Inspect Code" (default) | string

Human-readable name that appears in Process Advisor app, specified as a string.

Example: "My Code Inspection Task"

Data Types: string

DescriptionText — Task description
"This task uses Simulink Code Inspector to detect unintended functionality in your models by establishing model-to-code and code-to-model traceability." (default) | string

Task description, specified as a string.

When you point to a task in Process Advisor and click the information icon, the tooltip shows the task description.

Example: "This task uses Simulink Code Inspector to detect unintended functionality in your models by establishing model-to-code and code-to-model traceability."

Data Types: string

DescriptionCSH — Path to task documentation
path to RunCodeInspection documentation (default) | string

Path to task documentation, specified as a string.

When you point to a task in Process Advisor, click the ellipsis (**...**), and click **Help**, Process Advisor opens the task documentation.

Example: fullfile(pwd,"taskHelpFiles","myTaskDocumentation.pdf")

Data Types: string

RequiredIterationArtifactType — Artifact type that task can run on
"sl_model_file" (default) | string

Artifact type that the task can run on, specified as a string. The required iteration artifact type must be the artifact type supported by the `IterationQuery` property of the task.

For a list of valid artifact types, see “Valid Artifact Types” on page 9-2.

Data Types: `string`

`IterationQuery` — Find artifacts that task iterates over
`padv.builtin.query.FindModels` (default) | `padv.Query` object | name of `padv.Query` object

Query that finds the artifacts that the task iterates over, specified as a `padv.Query` object or the name of a `padv.Query` object. When you specify `IterationQuery`, the task runs one time *for each* artifact returned by the query. In the Process Advisor app, the artifacts returned by `IterationQuery` appear under task title.

For more information about task iterations, see "About the Process Model" in the User's Guide PDF.

Example: `padv.builtin.query.FindProjectFile`

`InputDependencyQuery` — Finds artifact dependencies for task inputs
`padv.Query` object | name of `padv.Query` object

Query that finds artifact dependencies for task inputs, specified as a `padv.Query` object or the name of a `padv.Query` object.

The build system runs the query specified by `InputDependencyQuery` to find the dependencies for the task inputs, since those dependencies can impact if task results are up-to-date.

For more information, see "About the Process Model" in the User's Guide PDF.

Example: `padv.builtin.query.GetDependentArtifacts`

`Licenses` — List of licenses that task requires
`"simulink_code_inspector"` (default) | string

List of licenses that the task requires, specified as a string.

Data Types: `string`

`LaunchToolAction` — Function that launches tool
`@launchToolAction` (default) | function handle

Function that launches a tool, specified as the function handle.

When you point to a task in the Process Advisor app, you can click the ellipsis (**...**) to see more options. For built-in tasks, you have the option to launch a tool associated with the task.

For the task `RunCodeInspection`, you can launch the Code Inspector app.

Data Types: `function_handle`

`LaunchToolText` — Description of action that `LaunchToolAction` property performs
`"Open Code Inspector"` (default) | string

Description of the action that the `LaunchToolAction` property performs, specified as a string.

Data Types: `string`

`InputQueries` — Inputs to task
`padv.Query` object | name of `padv.Query` object | array of `padv.Query` objects

Inputs to the task, specified as:

- a `padv.Query` object
- the name of `padv.Query` object
- an array of `padv.Query` objects
- an array of names of `padv.Query` objects

By default, the task `RunCodeInspection` gets the model and generated code inputs by using the built-in queries:

- `padv.builtin.query.GetIterationArtifact`
- `padv.builtin.query.GetOutputsOfDependentTask` on the task `padv.builtin.task.GenerateCode`

`OutputDirectory` — Location for standard task outputs
`fullfile('$DEFAULTOUTPUTDIR$','$ITERATIONARTIFACT$','code_inspection')` (default) | string

Location for standard task outputs, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see "Dynamically Resolve Paths Using Tokens" on page 10-2.

Data Types: `string`

Code Inspection Options

`IsTopModel` — Setting for specifying if current model is top model
`[]` (default) | `true` or `1` | `false` or `0`

Setting for specifying if current model is top model, specified as an empty logical array `[]` or as a numeric or logical `0` (`false`) or `1` (`true`).

By default, the task automatically identifies whether a model is a top model or a reference model. But you can specify `IsTopModel` as `true` or `false` if you want to override that behavior and only generate top model code or reference model code.

Example: `true`

Data Types: `logical`

`ReportFolder` — Path to generated report
`fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$', 'code_inspection')` (default) | string

Path to generated report, specified as a string.

The task uses this property to specify the report folder for code inspection.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see "Dynamically Resolve Paths Using Tokens" on page 10-2.

Data Types: `string`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Detect unintended functionality in your models by establishing model-to-code and code-to-model traceability using Simulink Code Inspector
	
	Note You do not need to manually invoke this method. When you run a task using the Process Advisor app or the `runprocess` function, the build system automatically invokes the `run` method for the task.
	
	The `run` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this built-in task, make sure to use the same method signature inside your custom task:
	
	`function taskResult = run(obj, input)`
	`  ...`
	`end`

`dryRun`	Dry-run the task to validate task inputs and generate representative task outputs without actually running the task.The `dryRun` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this class, make sure to use the same method signature inside your custom task:
	
	`function taskResult = dryRun(obj, input)`
	`    ...`
	`end`

`launchToolAction`	Launch the Code Inspector app. Process Advisor uses this method when you open the tool associated with a task.

Examples

Add Code Inspection Task to Process

Add a task that can detect unintended functionality in your models by establishing model-to-code and code-to-model traceability using Simulink Code Inspector.

Open the process model for your project. If you do not have a process model, open the Process Advisor app to automatically create a process model.

In the process model file, add the `RunCodeInspection` task to your process model by using the `addTask` method. By default, the `RunCodeInspection` task automatically identifies whether a model is a top model or a reference model.

```
slciTask = pm.addTask(padv.builtin.task.RunCodeInspection);
```

You can reconfigure the task behavior by using the task properties. For example, to specify a different location for the code inspection report:

```
slciTask.ReportFolder = fullfile("reports","code_inspection");
```

The `RunCodeInspection` task requires outputs from the `GenerateCode` task. Specify this dependency in your process model by using the `dependsOn` method.

To make sure that you run your tasks using the built-in task `GenerateCode` before you add the task, you can use conditional logic in your process model. For example:

```
includeGenerateCodeTask = true;
includeCodeInspection = true;

%% Generate Code
% Tools required: Embedded Coder
% By default, generating code for each model in the project
if includeGenerateCodeTask
    codegenTask = pm.addTask(padv.builtin.task.GenerateCode);
    % ... Optionally specify task property values
end

%% Inspect Code
% Tools required: Simulink Code Inspector
if includeGenerateCodeTask && includeCodeInspection
    slciTask = pm.addTask(padv.builtin.task.RunCodeInspection(IterationQuery=findModels));
    % ... Optionally specify task property values
end

%% Set Task Dependencies
if includeGenerateCodeTask && includeCodeInspection
    slciTask.dependsOn(codegenTask);
end
```

See Also

`addTask` | `padv.builtin.task.AnalyzeModelCode` | `padv.builtin.task.GenerateCode` | `padv.builtin.query.FindCodeForModel` | `padv.ProcessModel` | Process Advisor | `runprocess`

padv.builtin.task.RunModelStandards Class

Namespace: `padv.builtin.task padv.builtin.task padv.builtin.task`
Superclasses: `padv.Task`

Task for checking modeling standards with Model Advisor

Description

The `padv.builtin.task.RunModelStandards` class provides a task that can check your models for modeling conditions and configuration settings that cause inaccurate or inefficient simulation of the system that the model represents by using the Model Advisor app. Running model standards checking can also help you verify compliance with industry standards and guidelines.

You can add the task to your process model by using the method `addTask`. After you add the task to your process model, you can run the task from the Process Advisor app or by using the function `runprocess`. You can configure this task to specify which model standards the task runs. For example, you can specify a Model Advisor configuration file or list of check identifiers to include in the Model Advisor analysis. If you do not specify which model standards to run, the task runs a subset of high-integrity systems checks by default.

To view the source code for this built-in task, in the MATLAB Command Window, enter:

```
open padv.builtin.task.RunModelStandards
```

The `padv.builtin.task.RunModelStandards` class is a `handle` class.

Creation

Description

`task = padv.builtin.task.RunModelStandards()` creates a task for checking modeling standards using Model Advisor.

`task = padv.builtin.task.RunModelStandards(Name=Value)` sets certain properties using one or more name-value arguments. For example, `task = padv.builtin.task.RunModelStandards(Name = "MyModelAdvisorTask")` creates a task with the specified name.

You can use this syntax to set property values for `InputQueries`, `Name`, `IterationQuery`, `InputDependencyQuery`, `Licenses`, `LaunchToolAction`, and `LaunchToolText`.

The `padv.builtin.task.RunModelStandards` class also has other properties, but you cannot set those properties during task creation.

Properties

The `RunModelStandards` class inherits properties from `padv.Task`. The properties listed in “Specialized Inherited Properties” on page 11-0 are `padv.Task` properties that the `RunModelStandards` task overrides.

The task also has properties for specifying “Model Advisor Options” on page 11-0 for running Model Advisor checks by using `ModelAdvisor.run`.

Specialized Inherited Properties

`Name` — Unique identifier for task in process
`"padv.builtin.task.RunModelStandards"` (default) | string

Unique identifier for task in process, specified as a string.

Example: `"MyModelAdvisorTask"`

Data Types: `string`

`Title` — Human-readable name that appears in Process Advisor app
`"Check Modeling Standards"` (default) | string

Human-readable name that appears in Process Advisor app, specified as a string.

Example: `"My Model Advisor Task"`

Data Types: `string`

`DescriptionText` — Task description
`"This task uses the Model Advisor to check your models for modeling conditions and configuration settings."` (default) | string

Task description, specified as a string.

When you point to a task in Process Advisor and click the information icon, the tooltip shows the task description.

Example: `"This task uses the Model Advisor to check your models for modeling conditions and configuration settings."`

Data Types: `string`

`DescriptionCSH` — Path to task documentation
path to `RunModelStandards` documentation (default) | string

Path to task documentation, specified as a string.

When you point to a task in Process Advisor, click the ellipsis (**...**), and click **Help**, Process Advisor opens the task documentation.

Example: `fullfile(pwd,"taskHelpFiles","myTaskDocumentation.pdf")`

Data Types: `string`

`RequiredIterationArtifactType` — Artifact type that task can run on
`"sl_model_file"` (default) | string

Artifact type that the task can run on, specified as a string. The required iteration artifact type must be the artifact type supported by the `IterationQuery` property of the task.

For a list of valid artifact types, see “Valid Artifact Types” on page 9-2.

Data Types: `string`

IterationQuery — Find artifacts that task iterates over
padv.builtin.query.FindModels (default) | padv.Query object | name of padv.Query object

Query that finds the artifacts that the task iterates over, specified as a padv.Query object or the name of a padv.Query object. When you specify IterationQuery, the task runs one time *for each* artifact returned by the query. In the Process Advisor app, the artifacts returned by IterationQuery appear under task title.

For more information about task iterations, see "About the Process Model" in the User's Guide PDF.

InputDependencyQuery — Finds artifact dependencies for task inputs
padv.Query object | name of padv.Query object

Query that finds artifact dependencies for task inputs, specified as a padv.Query object or the name of a padv.Query object.

The build system runs the query specified by InputDependencyQuery to find the dependencies for the task inputs, since those dependencies can impact if task results are up-to-date.

For more information, see "About the Process Model" in the User's Guide PDF.

Example: padv.builtin.query.GetDependentArtifacts

LaunchToolAction — Function that launches tool
@launchToolAction (default) | function handle

Function that launches a tool, specified as the function handle.

When you point to a task in the Process Advisor app, you can click the ellipsis (**...**) to see more options. For built-in tasks, you have the option to launch a tool associated with the task.

For the task RunModelStandards, you can launch the Model Advisor app.

Data Types: function_handle

LaunchToolText — Description of action that LaunchToolAction property performs
"Open Model Advisor" (default) | string

Description of the action that the LaunchToolAction property performs, specified as a string.

Data Types: string

InputQueries — Inputs to task
padv.Query object | name of padv.Query object | array of padv.Query objects

Inputs to the task, specified as:

- a padv.Query object
- the name of padv.Query object
- an array of padv.Query objects
- an array of names of padv.Query objects

By default, the task RunModelStandards gets the current model that the task is iterating over by using the built-in query padv.builtin.query.GetIterationArtifact.

`OutputDirectory` — Location for standard task outputs
`fullfile('$DEFAULTOUTPUTDIR$','$ITERATIONARTIFACT$','model_standards')` (default) | string

Location for standard task outputs, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Data Types: `string`

Model Advisor Options

`CheckIDList` — List of unique identifiers for Model Advisor checks
`missing` (default) | string

List of unique identifiers for Model Advisor checks, specified as string.

Note If you specify `CheckIDList` and add a Model Advisor configuration file as an input for the task, the task runs Model Advisor using the Model Advisor configuration file and ignores the list of check IDs.

Example: `["mathworks.jmaab.db_0032","mathworks.jmaab.jc_0281"]`

Data Types: `string`

`DisplayResults` — Report display setting for Model Advisor
`"Summary"` (default) | `"Details"` | `"None"`

Report display setting for Model Advisor, specified as either:

- `"Summary"` — Display summary of the system results in the Command Window
- `"Details"` — Display a summary of the system results and the pass and fail results for each check on each system
- `"None"` — Do not display information in the Command Window

Example: `"Details"`

`ExtensiveAnalysis` — Extensive analysis setting for Model Advisor
`"on"` (default) | `"off"`

Extensive analysis setting for Model Advisor, specified as either:

- `"off"` — Model Advisor only runs checks in your configuration that do not trigger extensive analysis
- `"on"` — Model Advisor runs each check in your Model Advisor configuration file, including checks that trigger extensive analysis with tools like Simulink Design Verifier

Example: `"off"`

`Force` — Delete existing Model Advisor reports without prompts
`"on"` (default) | `"off"`

Delete existing Model Advisor reports without prompts, specified as either:

- `"off"` — Prompt you before removing existing `modeladvisor/`*`system`* folders.
- `"on"` — Automatically removes existing `modeladvisor/`*`system`* folders

Example: `"off"`

`ParallelMode` — Parallel execution setting for Model Advisor
`"off"` (default) | `"on"`

Parallel execution setting for Model Advisor, specified as either:

- `"off"` — Model Advisor does not run in parallel.
- `"on"` — If you have a Parallel Computing Toolbox™ license and a multicore machine, Model Advisor can run on multiple systems in parallel. When you specify `ParallelMode` as `"on"`, MATLAB automatically creates a parallel pool.

Example: `"on"`

`ReportFormat` — Format of generated report
`"html"` (default) | `"docx"`

Format of the generated report, specified as either:

- `"html"` — HTML format
- `"docx"` — Microsoft Word document format

Example: `"docx"`

`ReportName` — Prefix for Model Advisor report file name
`"$ITERATIONARTIFACT$_ModelAdvisor"` (default) | string

Prefix for the Model Advisor report file name, specified as a string. By default, an underscore and the model name, `"_`*`modelName`*`"`, are appended to the report file name.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Data Types: `string`

`ReportPath` — Folder for generated report
`fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$', 'model_standards')` (default) | string

Folder for the generated report, specified as a string.

Data Types: `string`

`ShowExclusions` — Exclusion display setting for report
`"on"` (default) | `"off"`

Exclusion display setting for the report, specified as either:

- `"off"` — Report does not list Model Advisor check exclusions

- `"on"` — Report lists Model Advisor check exclusions

Example: `"off"`

`TempDir` — Temporary working folder for Model Advisor
`"off"` (default) | `"on"`

Temporary working folder for Model Advisor, specified as either:

- `"off"` — Run Model Advisor in the current working folder
- `"on"` — Run Model Advisor from a temporary working folder. You can use this to avoid concurrency issues when running using a parallel pool.

Example: `"on"`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Check modeling standards using Model Advisor
	
	Note You do not need to manually invoke this method. When you run a task using the Process Advisor app or the `runprocess` function, the build system automatically invokes the `run` method for the task.
	
	The `run` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this built-in task, make sure to use the same method signature inside your custom task:
	
	`function taskResult = run(obj, input)`
	`  ...`
	`end`

`dryRun`	Dry-run the task to validate task inputs and generate representative task outputs without actually running the task.The `dryRun` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this class, make sure to use the same method signature inside your custom task:
	`function taskResult = dryRun(obj, input)`
	`    ...`
	`end`

`launchToolAction`	Launch the Model Advisor app. Process Advisor uses this method when you open the tool associated with a task.

Examples

Add Model Advisor Task to Process

Add a task that can check modeling standards using Model Advisor.

Open the process model for your project. If you do not have a process model, open the Process Advisor app to automatically create a process model.

In the process model file, add the `RunModelStandards` task to your process model by using the `addTask` method. By default, the `RunModelStandards` task runs a subset of high-integrity systems checks.

```
maTask = pm.addTask(padv.builtin.task.RunModelStandards);
```

You can reconfigure the task behavior by using the task properties. For example, to specify a different location for the Model Advisor report:

```
% Change Report path
maTask.ReportPath = fullfile(...
    "$DEFAULTOUTPUTDIR$","$ITERATIONARTIFACT$","model_standards_results");
```

Specify Model Advisor Configuration File

By default, the `RunModelStandards` task runs a subset of high-integrity checks. If you want the task to run the Model Advisor checks specified by the Model Advisor configuration file, you can add the configuration file as an input to the task.

In the process model, you find the Model Advisor configuration file by using the built-in query `padv.builtin.query.FindFileWithAddress` and then specify that query as the input query by using the `addInputQueries` function. For example, suppose you have a Model Advisor configuration file called `sampleChecks.json` in a folder called `tools`:

```
maTask = pm.addTask(padv.builtin.task.RunModelStandards);

% Specify which Model Advisor configuration to run
maTask.addInputQueries(padv.builtin.query.FindFileWithAddress( ...
    Type = "ma_config_file",...
    Path = fullfile("tools","sampleChecks.json")));
```

In this code for `addInputQueries`:

- The first argument, `"ma_config_file"`, specifies that the file is a Model Advisor configuration file.
- The second argument specifies the path to the Model Advisor configuration file. In this example, the configuration file is a file, `sampleChecks.json`, in the `tools` folder in the project.

Note If you provide both a list of check IDs (`CheckIDList`) and a Model Advisor configuration file for the task, the task runs Model Advisor using the Model Advisor configuration file and ignores the list of check IDs.

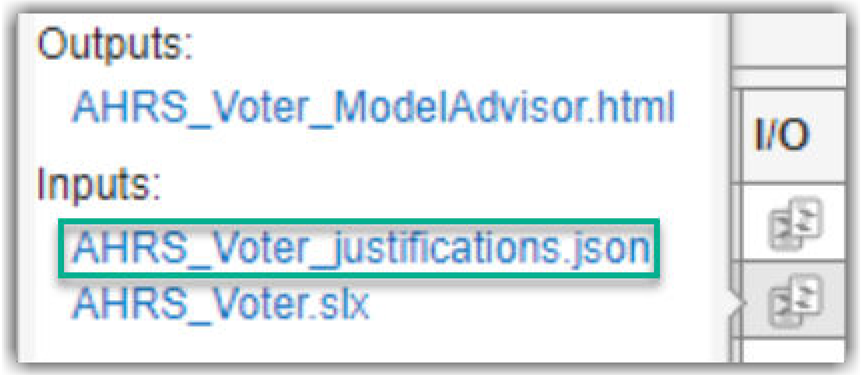
Specify Model Advisor Justification File

Starting in R2023a, if you want the `RunModelStandards` task to use your Model Advisor justification files when checking modeling standards, you can reconfigure the task to add the justification files as inputs.

In your process model, add the built-in query `padv.builtin.query.FindMAJustificationFileForModel` as an input query for the task and specify the folder, `JustificationFolder`, that contains the justification files. For example, if your justification files are in the directory `Justifications/ModelAdvisor` relative to your project root, add those justification files as inputs to the task by using the function `addInputQueries`.

```
maTask = pm.addTask(padv.builtin.task.RunModelStandards());

% Find and use justification files
maTask.addInputQueries(...
    padv.builtin.query.FindMAJustificationFileForModel(...
    JustificationFolder=fullfile("Justifications","ModelAdvisor")));
```

The justification file appears as an input in the **I/O** column in Process Advisor.


Outputs:
AHRS_Voter_ModelAdvisor.html
Inputs:
AHRS_Voter_justifications.json
AHRS_Voter.slx

Create and Configure Multiple Instances of Model Advisor Task

You can add multiple instances of a task to your process model to run different task configurations. For example, you can have one instance of the built-in task `padv.builtin.task.RunModelStandards` that runs a specific Model Advisor configuration for a subset of models and another Model Advisor configuration for other models.

In your process model, to create multiple instances of a task, you need to specify unique values for the `Name` properties of each task instance. By default, the task name is the name of the task class.

```
% Tasks need unique names
maTaskA = pm.addTask(padv.builtin.task.RunModelStandards(...
    Name = "maTaskA"));
maTaskB = pm.addTask(padv.builtin.task.RunModelStandards(...
    Name = "maTaskB"));
```

If you need to reconfigure the tasks, you can specify values for the other task properties. For example, you can specify which models the task runs on, which Model Advisor configuration file the task uses, and where the reports generate.

```
% Can specify unique title for task that appears in Process Advisor
maTaskA.Title = "Check Modeling Standards - A";
maTaskB.Title = "Check Modeling Standards - B";

% Can specify different Model Advisor configurations
maTaskA.addInputQueries(padv.builtin.query.FindFileWithAddress( ...
    Type="ma_config_file", Path=fullfile("configs","configA.json")));
maTaskB.addInputQueries(padv.builtin.query.FindFileWithAddress( ...
    Type="ma_config_file", Path=fullfile("configs","configB.json")));

% Can run on different sets of models
maTaskA.IterationQuery = padv.builtin.query.FindModels(...
    IncludePath = "control");
maTaskB.IterationQuery = padv.builtin.query.FindModelsWithLabel(...
    "ProjectLabelCategory","ProjectLabel");

% Specify unique locations for Model Advisor reports
maTaskA.ReportPath = fullfile( ...
    defaultResultPath,"model_standards_A_results");
```

```
maTaskB.ReportPath = fullfile( ...
    defaultResultPath,"model_standards_B_results");
```

padv.builtin.task.RunTestsPerModel Class

Namespace: `padv.builtin.task padv.builtin.task padv.builtin.task`
Superclasses: `padv.Task`

Task for running test cases associated with each model using Simulink Test

Description

The `padv.builtin.task.RunTestsPerModel` class provides a task that can run the test cases associated with your models using Simulink Test.

You can add the task to your process model by using the method `addTask`. After you add the task to your process model, you can run the task from the Process Advisor app or by using the function `runprocess`. The task runs each test case for each model in your project and certain tests can generate code.

The Process Advisor app shows the names of the models that have test cases under **Run Tests** in the **Tasks** column. If you want to see the names of both the models and the associated test cases, use the `padv.builtin.task.RunTestsPerTestCase` task instead.

To view the source code for this built-in task, in the MATLAB Command Window, enter:

```
open padv.builtin.task.RunTestsPerModel
```

The `padv.builtin.task.RunTestsPerModel` class is a `handle` class.

Note When you run the task, the task runs each test case individually and only executes test-case level callbacks. The task does not execute test-file level callbacks or test-suite level callbacks.

Creation

Description

`task = padv.builtin.task.RunTestsPerModel()` creates a task for running the test cases associated with your models using Simulink Test.

`task = padv.builtin.task.RunTestsPerModel(Name=Value)` sets certain properties using one or more name-value arguments. For example, `task = padv.builtin.task.RunTestsPerModel(Name = "MyRunTestsTask")` creates a task with the specified name.

You can use this syntax to set property values for `Name`, `Title`, `InputQueries`, `IterationQuery`, `InputDependencyQuery`, `Licenses`, `LaunchToolAction`, and `LaunchToolText`.

The `padv.builtin.task.RunTestsPerModel` class also has other properties, but you cannot set those properties during task creation.

Properties

The `RunTestsPerModel` class inherits properties from `padv.Task`. The properties listed in "Specialized Inherited Properties" on page 11-0 are `padv.Task` properties that the `RunTestsPerModel` task overrides.

The task also has properties for specifying "Test Execution Options" on page 11-0 .

Specialized Inherited Properties

`Name` — Unique identifier for task in process
`"padv.builtin.task.RunTestsPerModel"` (default) | string

Unique identifier for task in process, specified as a string.

Example: `"TestMyModels"`

Data Types: `string`

`Title` — Human-readable name that appears in Process Advisor app
`"Run Tests"` (default) | string

Human-readable name that appears in Process Advisor app, specified as a string.

Example: `"Run My Tests"`

Data Types: `string`

`DescriptionText` — Task description
`"This task uses Simulink Test to run the test cases associated with your model. The task runs the test cases on a model-by-model basis. Certain tests may generate code."` (default) | string

Task description, specified as a string.

When you point to a task in Process Advisor and click the information icon, the tooltip shows the task description.

Example: `"This task uses Simulink Test to run the test cases associated with your model. The task runs the test cases on a model-by-model basis. Certain tests may generate code."`

Data Types: `string`

`DescriptionCSH` — Path to task documentation
path to `RunTestsPerModel` documentation (default) | string

Path to task documentation, specified as a string.

When you point to a task in Process Advisor, click the ellipsis (**...**), and click **Help**, Process Advisor opens the task documentation.

Example: `fullfile(pwd,"taskHelpFiles","myTaskDocumentation.pdf")`

Data Types: `string`

`RequiredIterationArtifactType` — Artifact type that task can run on
`"sl_model_file"` (default) | string

Artifact type that the task can run on, specified as a string. The required iteration artifact type must be the artifact type supported by the `IterationQuery` property of the task.

For a list of valid artifact types, see “Valid Artifact Types” on page 9-2.

Data Types: `string`

`IterationQuery` — Find artifacts that task iterates over
`padv.builtin.query.FindModelsWithTestCases` (default) | `padv.Query` object | name of `padv.Query` object

Query that finds the artifacts that the task iterates over, specified as a `padv.Query` object or the name of a `padv.Query` object. When you specify `IterationQuery`, the task runs one time *for each* artifact returned by the query. In the Process Advisor app, the artifacts returned by `IterationQuery` appear under task title.

For more information about task iterations, see "About the Process Model" in the User's Guide PDF.

Example: `padv.builtin.query.FindModelsWithTestCases(ExcludePath = "Control")`

`InputDependencyQuery` — Finds artifact dependencies for task inputs
`padv.Query` object | name of `padv.Query` object

Query that finds artifact dependencies for task inputs, specified as a `padv.Query` object or the name of a `padv.Query` object.

The build system runs the query specified by `InputDependencyQuery` to find the dependencies for the task inputs, since those dependencies can impact if task results are up-to-date.

For more information, see "About the Process Model" in the User's Guide PDF.

Example: `padv.builtin.query.GetDependentArtifacts`

`Licenses` — List of additional licenses that task requires
`"simulink_test"` (default) | string

List of additional licenses that the task requires, specified as a string.

Data Types: `string`

`LaunchToolAction` — Function that launches tool
`@launchToolAction` (default) | function handle

Function that launches a tool, specified as the function handle.

When you point to a task in the Process Advisor app, you can click the ellipsis (**...**) to see more options. For built-in tasks, you have the option to launch a tool associated with the task.

For the task `RunTestsPerModel`, you can launch Simulink Test Manager.

Data Types: `function_handle`

`LaunchToolText` — Description of action that `LaunchToolAction` property performs
`"Open Test Manager"` (default) | string

Description of the action that the `LaunchToolAction` property performs, specified as a string.

Data Types: `string`

`InputQueries` — Inputs to task
`padv.Query` object | name of `padv.Query` object | array of `padv.Query` objects

Inputs to the task, specified as:

- a `padv.Query` object
- the name of `padv.Query` object
- an array of `padv.Query` objects
- an array of names of `padv.Query` objects

By default, the task `RunTestsPerModel` gets the current model by using the built-in query `padv.builtin.query.GetIterationArtifact` and finds the tests associated with that model by using the built-in query `padv.builtin.query.FindTestCasesForModel`.

`OutputDirectory` — Location for standard task outputs
`fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$','test_results')` (default) | string

Location for standard task outputs, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Data Types: `string`

Test Execution Options

`Author` — Name of report author
`"Process Advisor"` (default) | string

Name of the report author, specified as a string.

Data Types: `string`

`IncludeComparisonSignalPlots` — Include signal comparison plots in report
`false` or `0` (default) | `true` or `1`

Include the signal comparison plots in the report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

When `true`, the report includes the signal comparison plots defined under baseline criteria, equivalence criteria, or assessments using the verify operator in the test case.

Example: `true`

Data Types: `logical`

`IncludeCoverageResult` — Include coverage metrics in report
`true` or `1` (default) | `false` or `0`

Include coverage metrics that the test collects during test execution in the report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`IncludeErrorMessages` — Include error messages from test case simulations in report
`true` or `1` (default) | `false` or `0`

Include error messages from test case simulations in report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`IncludeMATLABFigures` — Include figures in report
`false` or `0` (default) | `true` or `1`

Include the figures opened from a callback script, custom criteria, or by the model in the report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`IncludeMLVersion` — Include MATLAB version information in report
`true` or `1` (default) | `false` or `0`

Include the version of MATLAB that ran the test cases in the report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`IncludeSimulationMetadata` — Include simulation metadata in report
`false` or `0` (default) | `true` or `1`

Include simulation metadata for each test case or iteration in the report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`IncludeSimulationSignalPlots` — Include simulation output plots for each signal in report
`true` or `1` (default) | `false` or `0`

Include the simulation output plots for each signal in the report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`IncludeTestRequirement` — Include test requirement link in report
`true` or `1` (default) | `false` or `0`

Include the test requirement link, defined under Requirements in the test case, in the report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`IncludeTestResults` — Include test results in report
`0` (default) | `1` | `2`

Include all or a subset of test results in the report, specified as either:

- `0` — Passed and failed results
- `1` — Only passed results
- `2` — Only failed results

Example: `2`

`LaunchReport` — Open generated report
`0` (default) | `1` | `2`

Open the generated report, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `true`

Data Types: `logical`

`NumPlotColumnsPerPage` — Number of columns of plots to include on report pages
`1` (default) | `2` | `3` | `4`

Number of columns of plots to include on report pages, specified as an integer `1`, `2`, `3`, or `4`.

Example: `4`

`NumPlotRowsPerPage` — Number of rows of plots to include on report pages
`2` (default) | `1` | `3` | `4`

Number of rows of plots to include on report pages, specified as an integer `1`, `2`, `3`, or `4`.

Example: `4`

`ReportFormat` — Format for generated report
`"pdf"` (default) | `"docx"` | `"zip"`

Format for the generated report, specified as either:

- `"pdf"` — PDF format
- `"docx"` — Microsoft Word document format
- `"zip"` — Zipped file that contains an HTML file, images, style sheet, and JavaScript files for an HTML report

Example: `"zip"`

`ReportPath` — Path to generated report
`string(fullfile('$DEFAULTOUTPUTDIR$', '$ITERATIONARTIFACT$','test_results'))` (default) | string

Path to the generated report, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Data Types: `string`

`ReportName` — File name for generated report
`"$ITERATIONARTIFACT$_Test"` (default) | string

File name for the generated report, specified as a string.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Data Types: `string`

`ReportTitle` — Title of report
`"$ITERATIONARTIFACT$ REPORT"` (default) | string

Title of the report, specified as a string.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Data Types: `string`

`ResultFileName` — Name of test result file
`"$ITERATIONARTIFACT$_ResultFile"` (default) | string

Name of test result file, specified as a string.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Data Types: `string`

`SaveResultsAfterRun` — Save test results to file after execution
`true` or `1` (default) | `false` or `0`

Save the test results to a file after execution, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`SimulationMode` — Simulation mode for running tests
`""` (default) | `"Normal"` | `"Accelerator"` | `"Rapid Accelerator"` | `"Software-in-the-Loop"` | `"Processor-in-the-Loop"`

Simulation mode for running tests, specified as `"Normal"`, `"Accelerator"`, `"Rapid Accelerator"`, `"Software-in-the-Loop"`, or `"Processor-in-the-Loop"`.

By default, the property is empty (`""`), which means the built-in task uses the simulation mode that you define in the test itself. If you specify a value other than `""`, the built-in task overrides the simulation mode set in Simulink Test Manager. You do not need to update the test parameters or settings to run the test in the new mode.

Example: `"Software-in-the-Loop"`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run test cases for each model using Simulink Test
	
	Note You do not need to manually invoke this method. When you run a task using the Process Advisor app or the `runprocess` function, the build system automatically invokes the `run` method for the task.
	
	The `run` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this built-in task, make sure to use the same method signature inside your custom task:
	
	`function taskResult = run(obj, input)`
	`  ...`
	`end`

`dryRun`	Dry-run the task to validate task inputs and generate representative task outputs without actually running the task.The `dryRun` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this class, make sure to use the same method signature inside your custom task:
	
	`function taskResult = dryRun(obj, input)`
	`    ...`
	`end`

`launchToolAction`	Launch Simulink Test Manager. Process Advisor uses this method when you open the tool associated with a task.

Examples

Add Task to Run Tests for Each Model

Add a task to your process that can run test cases for each model using Simulink Test.

Open the process model for your project. If you do not have a process model, open the Process Advisor app to automatically create a process model.

In the process model file, add the `RunTestsPerModel` task to your process model by using the `addTask` method.

```
runTestsPerModelTask = pm.addTask(padv.builtin.task.RunTestsPerModel);
```

You can reconfigure the task behavior by using the task properties. For example, to generate a zipped HTML report file instead of a PDF:

```
runTestsPerModelTask.ReportFormat = "zip";
```

If you want to use the `MergeTestResults` task to merge the test results, you need to reconfigure the input queries for the `MergeTestResults` task to get the outputs from the `RunTestsPerModel` task. By default, the `MergeTestResults` task only gets the current model and the outputs from the task `RunTestsPerTestCase`.

```
%% Merge Test Results from Running Tests per Model
mergeTestTask = pm.addTask(padv.builtin.task.MergeTestResults(...
    InputQueries = [...
    padv.builtin.query.GetIterationArtifact,...
    padv.builtin.query.GetOutputsOfDependentTask(Task = runTestsPerModelTask)]));
```

Since that `MergeTestResults` task now depends on outputs from the `RunTestsPerModel` task, you also need to explicitly specify those dependencies in the process model.

```
mergeTestTask.dependsOn(runTestsPerModelTask);
```

Run Tests in Multiple Simulation Modes

Suppose that you want to have one instance of the `RunTestsPerModel` task that runs normal mode tests and another instance that runs software-in-the-loop (SIL) tests. You can create multiple instances of the task inside your process model and then use the `SimulationMode` to override the simulation mode set in Simulink Test Manager.

Inside your process model, create multiple instances of the `RunTestsPerModel` task. When you create multiple instances of a task, you must specify a unique name for each task object. For example:

```
milTask = pm.addTask(padv.builtin.task.RunTestsPerModel(...
    Name = "RunTestsNormalMode"));
silTask = pm.addTask(padv.builtin.task.RunTestsPerModel(...
    Name = "RunTestsSILMode"));
```

The build system uses the `Name` property as the unique identifier for the task.

Reconfigure the task instances to run tests in different simulation modes. You can run tests in different simulation modes without having to change the test definition by using the `SimulationMode` property to override the mode. For example:

```
milTask.SimulationMode = "Normal";
silTask.SimulationMode = "Software-in-the-Loop";
```

To prevent task outputs from overwriting each other, reconfigure the names and locations of the task outputs by using the associated task properties. For example:

```
% Specify normal mode outputs
milTask.OutputDirectory = defaultTestResultPath;
milTask.ReportName = '$ITERATIONARTIFACT$_Normal_Test';
milTask.ResultFileName = '$ITERATIONARTIFACT$_Normal_ResultFile';

% Specify SIL mode outputs
silTask.OutputDirectory = defaultTestResultPath;
silTask.ReportName = '$ITERATIONARTIFACT$_SIL_Test';
silTask.ResultFileName = '$ITERATIONARTIFACT$_SIL_ResultFile';
```

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

By default, the `MergeTestResults` task only gets the current model and the outputs from the task `padv.builtin.task.RunTestsPerTestCase`.

If you want to merge the test results from these two task instances using the `MergeTestResults` task, you need to reconfigure the input queries for the `MergeTestResults` task to get the outputs from those task instances. For example:

```
%% Merge Test Results (Normal and SIL)
mergeTestTask = pm.addTask(padv.builtin.task.MergeTestResults(...
    InputQueries = [...
    padv.builtin.query.GetIterationArtifact,...
    padv.builtin.query.GetOutputsOfDependentTask(Task = "RunTestsNormalMode"),...
    padv.builtin.query.GetOutputsOfDependentTask(Task = "RunTestsSILMode")]));
```

Since that `MergeTestResults` task depends on outputs from the `RunTestsPerTestCase` tasks, you need to explicitly specify those dependencies in the process model.

```
mergeTestTask.dependsOn(milTask);
mergeTestTask.dependsOn(silTask);
```

padv.builtin.task.RunTestsPerTestCase Class

Namespace: `padv.builtin.task padv.builtin.task padv.builtin.task`
Superclasses: `padv.Task`

Task for running each test case using Simulink Test

Description

The `padv.builtin.task.RunTestsPerTestCase` class provides a task that can run each test case using Simulink Test.

You can add the task to your process model by using the method `addTask`. After you add the task to your process model, you can run the task from the Process Advisor app or by using the function `runprocess`. The task runs each test case individually and certain tests can generate code.

The Process Advisor app shows the names of both the test cases and the associated models under **Run Tests** in the **Tasks** column. If you only want to see the model names, use the `padv.builtin.task.RunTestsPerModel` task instead.

To generate a consolidated test results report and a merged coverage report for your model, you can use the built-in task `padv.builtin.task.MergeTestResults`.

To view the source code for this built-in task, in the MATLAB Command Window, enter:

```
open padv.builtin.task.RunTestsPerTestCase
```

The `padv.builtin.task.RunTestsPerTestCase` class is a `handle` class.

Note Since this task runs each test case individually, the task only executes test-case level callbacks. The task does not execute test-file level callbacks or test-suite level callbacks.

Creation

Description

`task = padv.builtin.task.RunTestsPerTestCase()` creates a task for running test cases using Simulink Test.

`task = padv.builtin.task.RunTestsPerTestCase(Name=Value)` sets certain properties using one or more name-value arguments. For example, `task = padv.builtin.task.RunTestsPerTestCase(Name = "MyRunTestsTask")` creates a task with the specified name.

You can use this syntax to set property values for `Name`, `InputQueries`, `IterationQuery`, `InputDependencyQuery`, `Licenses`, `LaunchToolAction`, and `LaunchToolText`.

The `padv.builtin.task.RunTestsPerTestCase` class also has other properties, but you cannot set those properties during task creation.

Properties

The `RunTestsPerTestCase` class inherits properties from `padv.Task`. The properties listed in "Specialized Inherited Properties" on page 11-0 are `padv.Task` properties that the `RunTestsPerTestCase` task overrides.

The task also has properties for specifying "Test Execution Options" on page 11-0 .

Specialized Inherited Properties

`Name` — Unique identifier for task in process
`"padv.builtin.task.RunTestsPerTestCase"` (default) | string

Unique identifier for task in process, specified as a string.

Example: `"MyRunTestsTask"`

Data Types: `string`

`Title` — Human-readable name that appears in Process Advisor app
`"Run Tests"` (default) | string

Human-readable name that appears in Process Advisor app, specified as a string.

Example: `"My Run Tests Task"`

Data Types: `string`

`DescriptionText` — Task description
`"This task uses Simulink Test to run the test cases associated with your model. The task runs the test cases on a test-by-test basis. Certain tests may generate code."` (default) | string

Task description, specified as a string.

When you point to a task in Process Advisor and click the information icon, the tooltip shows the task description.

Example: `"This task uses Simulink Test to run the test cases associated with your model. The task runs the test cases on a test-by-test basis. Certain tests may generate code."`

Data Types: `string`

`DescriptionCSH` — Path to task documentation
path to `RunTestsPerTestCase` documentation (default) | string

Path to task documentation, specified as a string.

When you point to a task in Process Advisor, click the ellipsis (**...**), and click **Help**, Process Advisor opens the task documentation.

Example: `fullfile(pwd,"taskHelpFiles","myTaskDocumentation.pdf")`

Data Types: `string`

`RequiredIterationArtifactType` — Artifact type that task can run on
`"sl_test_case"` (default) | string

Artifact type that the task can run on, specified as a string. The required iteration artifact type must be the artifact type supported by the `IterationQuery` property of the task.

For a list of valid artifact types, see “Valid Artifact Types” on page 9-2.

Data Types: `string`

`IterationQuery` — Find artifacts that task iterates over
`padv.builtin.query.FindTestCasesForModel` (default) | `padv.Query` object | name of `padv.Query` object

Query that finds the artifacts that the task iterates over, specified as a `padv.Query` object or the name of a `padv.Query` object. When you specify `IterationQuery`, the task runs one time *for each* artifact returned by the query. In the Process Advisor app, the artifacts returned by `IterationQuery` appear under task title.

For more information about task iterations, see "About the Process Model" in the User's Guide PDF.

`InputDependencyQuery` — Finds artifact dependencies for task inputs
`padv.Query` object | name of `padv.Query` object

Query that finds artifact dependencies for task inputs, specified as a `padv.Query` object or the name of a `padv.Query` object.

The build system runs the query specified by `InputDependencyQuery` to find the dependencies for the task inputs, since those dependencies can impact if task results are up-to-date.

For more information, see "About the Process Model" in the User's Guide PDF.

Example: `padv.builtin.query.GetDependentArtifacts`

`Licenses` — List of licenses that task requires
`"simulink_test"` (default) | string

List of licenses that the task requires, specified as a string.

Data Types: `string`

`LaunchToolAction` — Function that launches tool
`@launchToolAction` (default) | function handle

Function that launches a tool, specified as the function handle.

When you point to a task in the Process Advisor app, you can click the ellipsis (**...**) to see more options. For built-in tasks, you have the option to launch a tool associated with the task.

For the task `RunTestsPerTestCase`, you can launch Simulink Test Manager.

Data Types: `function_handle`

`LaunchToolText` — Description of action that `LaunchToolAction` property performs
`"Open Test Manager"` (default) | string

Description of the action that the `LaunchToolAction` property performs, specified as a string.

Data Types: `string`

`InputQueries` — Inputs to task

`padv.Query` object | name of `padv.Query` object | array of `padv.Query` objects

Inputs to the task, specified as:

- a `padv.Query` object
- the name of `padv.Query` object
- an array of `padv.Query` objects
- an array of names of `padv.Query` objects

By default, the task `RunTestsPerTestCase` gets the current test case that the task is iterating over by using the built-in query `padv.builtin.query.GetIterationArtifact`.

`OutputDirectory` — Location for standard task outputs

`fullfile('$DEFAULTOUTPUTDIR$','$ROOTITERATIONARTIFACT$','test_results')` (default) | string

Location for standard task outputs, specified as a string.

The built-in tasks use tokens, like `$DEFAULTOUTPUTDIR$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Data Types: `string`

Test Execution Options

`ResultFileName` — Name of test result file

`"$ITERATIONARTIFACT$_ResultFile"` (default) | string

Name of test result file, specified as a string.

The built-in tasks use tokens, like `$ITERATIONARTIFACT$`, as placeholders for dynamic path resolution during run-time. For information on the tokens, see “Dynamically Resolve Paths Using Tokens” on page 10-2.

Data Types: `string`

`SimulationMode` — Simulation mode for running tests

`""` (default) | `"Normal"` | `"Accelerator"` | `"Rapid Accelerator"` | `"Software-in-the-Loop"` | `"Processor-in-the-Loop"`

Simulation mode for running tests, specified as `"Normal"`, `"Accelerator"`, `"Rapid Accelerator"`, `"Software-in-the-Loop"`, or `"Processor-in-the-Loop"`.

By default, the property is empty (`""`), which means the built-in task uses the simulation mode that you define in the test itself. If you specify a value other than `""`, the built-in task overrides the simulation mode set in Simulink Test Manager. You do not need to update the test parameters or settings to run the test in the new mode.

Example: `"Software-in-the-Loop"`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run test cases using Simulink Test **Note** You do not need to manually invoke this method. When you run a task using the Process Advisor app or the `runprocess` function, the build system automatically invokes the `run` method for the task. The `run` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this built-in task, make sure to use the same method signature inside your custom task: `function taskResult = run(obj, input)` `...` `end`
`dryRun`	Dry-run the task to validate task inputs and generate representative task outputs without actually running the task.The `dryRun` method inside this built-in task runs on a task object `obj` with task input `input` and returns a task result `taskResult`. The task result is a `padv.TaskResult` object that can store the results from pass, fail, and error assessments. If you inherit from this class, make sure to use the same method signature inside your custom task: `function taskResult = dryRun(obj, input)` `...` `end`
`launchToolAction`	Launch Simulink Test Manager. Process Advisor uses this method when you open the tool associated with a task.

Examples

Add Task to Run Test Cases

Add a task to your process that can run test cases using Simulink Test.

Open the process model for your project. If you do not have a process model, open the Process Advisor app to automatically create a process model.

In the process model file, add the RunTestsPerTestCase task to your process model by using the addTask method.

```
runTestsPerTestCaseTask = pm.addTask(padv.builtin.task.RunTestsPerTestCase);
```

You can reconfigure the task behavior by using the task properties. For example, to specify a different file name for the test results:

```
runTestsPerTestCaseTask.ResultFileName = "$ITERATIONARTIFACT$_TestResultsFile";
```

If you want to generate a consolidated test results report and merged coverage reports, you can add the built-in task MergeTestResults to your process. By default, the built-in task MergeTestResults gets the current model and the outputs from the task RunTestsPerTestCase.

Run Specific Test Cases Based on Tags

If you want the RunTestsPerTestCase task to only run on test cases that have a specific test tag, specify the IterationQuery using the built-in query padv.builtin.query.FindTestCasesForModel and specify the test tag using the Tags argument. For example, to have the task only run on test cases that were tagged with the test tag FeatureA:

```
runTestsPerTestCaseTask = pm.addTask(padv.builtin.task.RunTestsPerTestCase,...
    IterationQuery = padv.builtin.query.FindTestCasesForModel(Tags="FeatureA"));
```

Run Specific Test Cases Based on Project Labels

Suppose that you only want the RunTestsPerTestCase task to run for tests that use a specific project label.

By default, the RunTestsPerTestCase task in the default process model uses the built-in query padv.builtin.query.FindTestCasesForModel as the IterationQuery. This means that the task runs once for each test case associated with models in the project.

To run the task for tests that use a specific project label, in the process model, you can change the IterationQuery for the task to:

1. Use the built-in query padv.builtin.query.FindTestCasesForModel to find the models in the project
2. Specify the IncludeLabel argument of the query to only include test cases that use a specific project label. In this example, the project label is ModelTest and the project label category is TestType.

```
milTask = pm.addTask(padv.builtin.task.RunTestsPerTestCase());

% Specify which set of artifacts to run for
milTask.IterationQuery = ...
    padv.builtin.query.FindTestCasesForModel(...
        IncludeLabel = {'TestType','ModelTest'});
```

For more information on the built-in queries, see "Built-In Query Library". If you need to perform a query that is not already covered by a built-in query, see "Create Custom Query" in the User's Guide PDF.

Built-In Query Library

The support package CI/CD Automation for Simulink Check contains several built-in queries that can find specific sets of artifacts in your project. You can use the queries when you define your process, but note that you can only use certain queries as an input query (`InputQueries`) or iteration query (`IterationQuery`) for a task. The built-in queries include:

Query	Returns	Iteration Query	Input Query
`padv.builtin.query.FindArtifacts`	Artifacts that meet specified criteria	✔	✔*
`padv.builtin.query.FindCodeForModel`	Generated code files and `buildInfo.mat` for a model	✔	✔
`padv.builtin.query.FindDesignModels`	Units and components in project	✔	
`padv.builtin.query.FindExternalCodeCache`	External code cache files in project		✔
`padv.builtin.query.FindFilesWithLabel`	Files with specific project label	✔	
`padv.builtin.query.FindFileWithAddress`	File at the specified address	✔	✔
`padv.builtin.query.FindMAJustificationFileForModel`	Find Model Advisor justification files	✔	✔
`padv.builtin.query.FindModels`	Models	✔	✔*
`padv.builtin.query.FindModelsWithLabel`	Models with specific project label	✔	
`padv.builtin.query.FindModelsWithTestCases`	Models associated with a test case	✔	
`padv.builtin.query.FindProjectFile`	Project file	✔	✔
`padv.builtin.query.FindRefModels`	Referenced models	✔	
`padv.builtin.query.FindRequirements`	Requirement sets	✔	✔*
`padv.builtin.query.FindRequirementsForModel`	Requirements associated with model	✔	✔
`padv.builtin.query.FindTestCasesForModel`	Test cases associated with model	✔	✔
`padv.builtin.query.FindTopModels`	Top models	✔	✔

Query	Returns	Iteration Query	Input Query
`padv.builtin.query.FindUnits`	Units in the project	✔	✔
`padv.builtin.query.GetDependentArtifacts`	Dependent artifacts for artifact		✔
`padv.builtin.query.GetIterationArtifact`	Artifact that the task is iterating over		✔
`padv.builtin.query.GetOutputsOfDependentTask`	Outputs from immediate predecessor task		✔

*You cannot use the query as an input query if you specify the query input argument `InProject` as `true`.

Reference pages for the built-in task are listed alphabetically on the following pages.

Tip You can access help for the built-in queries from the MATLAB Command Window. For example, this code returns help information for the built-in query `padv.builtin.query.FindArtifacts`:

```
help padv.builtin.query.FindArtifacts
```

padv.builtin.query.FindArtifacts Class

Namespace: `padv.builtin.query padv.builtin.query`
Superclasses: `padv.Query`

Query for finding artifacts

Description

The `padv.builtin.query.FindArtifacts` class provides a query that can return artifacts in your project folder. By default, the query finds all artifacts in your project folder. You can automatically include or exclude certain artifacts by using the optional name-value arguments.

You can use this query in your process model to find artifacts for your tasks to iterate over or use as inputs. If you only need to find a single file at a specific path, you can use the built-in query `padv.builtin.query.FindFileWithAddress` instead.

The `padv.builtin.query.FindArtifacts` class is a `handle` class.

Creation

Description

`query = padv.builtin.query.FindArtifacts()` creates a query for finding the artifacts in your project folder.

`query = padv.builtin.query.FindArtifacts(Name=Value)` sets certain properties using one or more name-value arguments. For example, `padv.builtin.query.FindArtifacts(InProject = true)` creates a query that only finds artifact that were explicitly added to the project.

The `padv.builtin.query.FindArtifacts` class also has other properties, but you cannot set those properties during query creation.

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `query = padv.builtin.query.FindArtifacts(ExcludePath = "Control")`

`ArtifactType` — Type of artifact
`"sl_model_file"` | `"m_file"` | `"zc_file"` | ...

Type of artifact, specified as one or more of the values listed in this table. To specify multiple values, use an array.

Artifact Type	Description
"harness_info_file"	Harness info file
"m_class"	MATLAB class
"m_file"	MATLAB file
"m_func"	MATLAB function
"m_method"	MATLAB class method
"m_property"	MATLAB class property
"ma_config_file"	Model Advisor configuration file
"ma_justification_file"	Model Advisor justification file
"other_file"	Other file
"padv_output_file"	Process Advisor output file
"sf_chart"	Stateflow chart
"sf_graphical_fcn"	Stateflow graphical function
"sf_group"	Stateflow group
"sf_state"	Stateflow state
"sf_state_transition_chart"	Stateflow state transition chart
"sf_truth_table"	Stateflow truth table
"sl_block_diagram"	Block diagram
"sl_data_dictionary_file"	Data dictionary file
"sl_embedded_matlab_fcn"	MATLAB function
"sl_harness_block_diagram"	Harness block diagram
"sl_harness_file"	Test harness file
"sl_library_file"	Library file
"sl_model_file"	Simulink model file
"sl_protected_model_file"	Protected Simulink model file
"sl_req_table"	Requirements Table
"sl_subsystem"	Subsystem
"sl_subsystem_file"	Subsystem file
"sl_test_case"	Simulink Test case
"sl_test_case_result"	Simulink Test case result
"sl_test_file"	Simulink Test file
"sl_test_iteration"	Simulink Test iteration
"sl_test_iteration_result"	Simulink Test iteration result
"sl_test_report_file"	Simulink Test result report
"sl_test_result_file"	Simulink Test result file
"sl_test_resultset"	Simulink Test result set
"sl_test_seq"	Test Sequence

Artifact Type	Description
"sl_test_suite"	Simulink Test suite
"sl_test_suite_result"	Simulink Test suite result
"zc_block_diagram"	System Composer architecture
"zc_component"	System Composer architecture component
"zc_file"	System Composer architecture file

Example: "m_file"

Example: ["sl_model_file" "zc_file"]

ExcludeLabel — Exclude artifacts with specific project label
cell array

Exclude artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: {"Classification","Design"}

Data Types: cell

ExcludePath — Exclude artifacts where path contains specific text
string | character vector

Exclude artifacts where the path contains specific text, specified as a string or a character vector. Consider using ExcludePathRegex instead.

Example: "Control"

Data Types: string

ExcludePathRegex — Exclude artifacts where path matches regular expression pattern
string | character vector

Exclude artifacts where the path matches a regular expression pattern, specified as a string or a character vector. ExcludePathRegex expects UNIX-style path separators.

If you want to use a literal path, use ExcludePath instead. You can specify either ExcludePath or ExcludePathRegex but not both.

Example: "DD_.*\.sldd"

Data Types: char | string

FilterSubFileArtifacts — Filter out sub-file artifacts from query results
1 (true) (default) | 0 (false)

Filter out sub-file artifacts from query results, specified as a numeric or logical 1 (true) or 0 (false).

A sub-file is a part of a larger file. For example, a subsystem is a sub-file of a model file.

Example: false

Data Types: logical

`IncludeLabel` — Find artifacts with specific project label
cell array

Find artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePath` — Find artifacts where path contains specific text
string

Find artifacts where the path contains specific text, specified as a string. Consider using `IncludePathRegex` instead.

Example: `"Control"`

Data Types: `string`

`IncludePathRegex` — Find artifacts where path matches regular expression pattern
string | character vector

Find artifacts where the path matches a regular expression pattern, specified as a character vector or string. `IncludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `IncludePath` instead. You can specify either `IncludePath` or `IncludePathRegex` but not both.

Example: `"DD_.*\.sldd"`

Data Types: `char` | `string`

`InProject` — Include only artifacts added to project
`0` (`false`) (default) | `1` (`true`)

Include only artifacts that have been added to the project, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Note If you specify `InProject` as `true`, you cannot use the query as an input query.

Example: `true`

Data Types: `logical`

`Name` — Unique identifier for query
string

Unique identifier for query, specified as a string.

Example: `"FindMyArtifacts"`

Data Types: `string`

Properties

`ArtifactType` — Type of artifact
`"sl_model_file"` | `"m_file"` | `"zc_file"` | ...

Type of artifact, specified as one or more of the values listed in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration

Artifact Type	Description
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

Example: `"m_file"`

Example: `["sl_model_file" "zc_file"]`

`IncludeLabel` — Find artifacts with specific project label
cell array

Find artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`ExcludeLabel` — Exclude artifacts with specific project label
cell array

Exclude artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePathRegex` — Find artifacts where path matches regular expression pattern
string | character vector

Find artifacts where the path matches a regular expression pattern, specified as a character vector or string. `IncludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `IncludePath` instead. You can specify either `IncludePath` or `IncludePathRegex` but not both.

Example: `"DD_.*\.sldd"`

Data Types: `char` | `string`

`ExcludePathRegex` — Exclude artifacts where path matches regular expression pattern
string | character vector

Exclude artifacts where the path matches a regular expression pattern, specified as a string or a character vector. `ExcludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `ExcludePath` instead. You can specify either `ExcludePath` or `ExcludePathRegex` but not both.

Example: `"DD_.*\.sldd"`

Data Types: `char` | `string`

`FilterSubFileArtifacts` — Filter out sub-file artifacts from query results
`1` (`true`) (default) | `0` (`false`)

Filter out sub-file artifacts from query results, specified as a numeric or logical `1` (`true`) or `0` (`false`).

A sub-file is a part of a larger file. For example, a subsystem is a sub-file of a model file.

Example: `false`

Data Types: `logical`

`InProject` — Include only artifacts added to project
`0` (`false`) (default) | `1` (`true`)

Include only artifacts that have been added to the project, specified as a numeric or logical `1` (`true`) or `0` (`false`).

For more information about how to add or remove files from a project, see "Add Files to the Project".

Note If you specify `InProject` as `true`, you cannot use the query as an input query.

Example: `true`

Attributes:

`Dependent`	`true`

Data Types: `logical`

`Title` — Query title
`"Find all artifacts in project that meet the specified criteria"` (default) | string | character vector

Query title, specified as a string or a character vector.

Example: `"Find my artifacts"`

Data Types: `string`

`DefaultArtifactType` — Default artifact type returned by query
`"padv_output_file"` (default) | `"m_file"` | `"sl_model_file"` | `"zc_file"` | ...

Default artifact type returned by the query, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file

Artifact Type	Description
"m_class"	MATLAB class
"m_file"	MATLAB file
"m_func"	MATLAB function
"m_method"	MATLAB class method
"m_property"	MATLAB class property
"ma_config_file"	Model Advisor configuration file
"ma_justification_file"	Model Advisor justification file
"other_file"	Other file
"padv_output_file"	Process Advisor output file
"sf_chart"	Stateflow chart
"sf_graphical_fcn"	Stateflow graphical function
"sf_group"	Stateflow group
"sf_state"	Stateflow state
"sf_state_transition_chart"	Stateflow state transition chart
"sf_truth_table"	Stateflow truth table
"sl_block_diagram"	Block diagram
"sl_data_dictionary_file"	Data dictionary file
"sl_embedded_matlab_fcn"	MATLAB function
"sl_harness_block_diagram"	Harness block diagram
"sl_harness_file"	Test harness file
"sl_library_file"	Library file
"sl_model_file"	Simulink model file
"sl_protected_model_file"	Protected Simulink model file
"sl_req_table"	Requirements Table
"sl_subsystem"	Subsystem
"sl_subsystem_file"	Subsystem file
"sl_test_case"	Simulink Test case
"sl_test_case_result"	Simulink Test case result
"sl_test_file"	Simulink Test file
"sl_test_iteration"	Simulink Test iteration
"sl_test_iteration_result"	Simulink Test iteration result
"sl_test_report_file"	Simulink Test result report
"sl_test_result_file"	Simulink Test result file
"sl_test_resultset"	Simulink Test result set
"sl_test_seq"	Test Sequence
"sl_test_suite"	Simulink Test suite

Artifact Type	Description
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

Example: `"zc_file"`

Example: `["sl_model_file" "zc_file"]`

`Parent` — Initial query that runs before iteration query
`padv.Query` | Name of `padv.Query` object

Initial query that runs before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify an iteration query for a task, the parent query is the initial query that the build system runs before running the specified iteration query.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see "Best Practices for Process Model Authoring" in the User's Guide PDF.

Example: `sharedQuery`

Example: `"FindMyInitialArtifacts"`

`Name` — Unique identifier for query
string

Unique identifier for query, specified as a string.

Example: `"FindMyArtifacts"`

Data Types: `string`

`ShowFileExtension` — Show file extensions for returned artifacts
`0` (`false`) | `1` (`true`)

Show file extensions in the `Alias` property of returned artifacts, specified as a numeric or logical `1` (`true`) or `0` (`false`). The `Alias` property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the `Alias` property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property `ShowFileExtension` as `true`.

Example: `true`

Data Types: `logical`

`SortArtifacts` — Setting for automatically sorting artifacts by address
`true` or `1` (default) | `false` or `0`

Setting for automatically sorting artifacts by address, specified as a numeric or logical `1` (`true`) or `0` (`false`). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal `sortArtifacts` method in a subclass that defines a custom sort behavior. For an example, see "Sort Artifacts in Specific Order" in the User's Guide PDF.

The build system automatically calls the `sortArtifacts` method when using the process model. The `sortArtifacts` method expects two input arguments: a `padv.Query` object and a list of `padv.Artifact` objects returned by the `run` method. The `sortArtifacts` method should return a list of sorted `padv.Artifact` objects.

Example: `SortArtifacts = false`

Data Types: `logical`

`FunctionHandle` — Handle to function that function-based query runs
`function_handle`

Handle to the function that a function-based query runs, specified as a `function_handle`.

If you define your query functionality inside a function and you or the build system call `run` on the query, the query runs the function specified by the `function_handle`.

The built-in queries are defined inside classes and do not use the `FunctionHandle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,~)`
	`    ...`
	`end`

Examples

Find Data Dictionaries for Task in Process

You can use the `FindArtifacts` query in your process model to find artifacts for your tasks to iterate over (`IterationQuery`) or use as inputs (`addInputQueries`). For example, you can use the `FindArtifacts` query to find the data dictionaries in your project folder and have a task run one time for each data dictionary.

Open a project. For this example, open the Process Advisor example project.

```
processAdvisorExampleStart
```

Suppose that you have a custom task, `MyCustomTask`, that you add to your process model. You can use the built-in query `padv.builtin.query.FindArtifacts` to find specific types of artifacts. To find the data dictionaries in the project, you specify the `ArtifactType` argument as `"sl_data_dictionary_file"`. Edit the process model to include this code:

```
    taskObj = addTask(pm, "MyCustomTask",...
        IterationQuery = padv.builtin.query.FindArtifacts(...
        ArtifactType = "sl_data_dictionary_file"),...
        InputQueries = padv.builtin.query.GetIterationArtifact);
```

When you specify `InputQueries` as `padv.builtin.query.GetIterationArtifact`, that allows the task to use the artifacts returned by `IterationQuery` as inputs to the task.

In Process Advisor, view the updated **Tasks** by clicking **Refresh Tasks** and switching to the **Project** view. For the task `MyCustomTask`, there is one task iteration for each data dictionary.

Test FindArtifacts Query Outside Process Model

Although you typically use a query inside your process model, you can run an instance of the `FindArtifacts` query outside of your process model to confirm which artifacts the query returns.

Open a project. For this example, you can open the Process Advisor example project.

```
processAdvisorExampleStart
```

Create an instance of the query. You can use the arguments of the query to filter the query results. For example, you can use the `IncludeLabel` argument to have the query only return artifacts that use the `Design` project label from the `Classification` project label category.

```
q = padv.builtin.query.FindArtifacts(...
IncludeLabel = {'Classification','Design'});
```

Run the query and inspect the array of artifacts that the query returns.

```
run(q)
```

```
ans = 

  1×26 Artifact array with properties:

    Type
    Parent
    ArtifactAddress
```

Capabilities and Limitations

This table identifies functionality that is supported by the query.

Functionality	Supported?
Input query for task	Only when the query property `InProject` is `false`.
Iteration query for task	Yes. See IterationQuery.

See Also

`padv.builtin.query.FindExternalCodeCache` | `padv.builtin.query.FindFilesWithLabel` | `padv.builtin.query.FindModels` | `padv.builtin.query.FindModelsWithLabel` | `padv.builtin.query.FindRequirements`

padv.builtin.query.FindCodeForModel Class

Namespace: `padv.builtin.query padv.builtin.query`
Superclasses: `padv.Query`

Query for finding generated code files and `buildInfo.mat` for model

Description

The `padv.builtin.query.FindCodeForModel` class provides a query that can return the generated code files and `buildInfo.mat` for a model. You can automatically include or exclude certain artifacts by using the optional name-value arguments.

You can use this query in your process model to find artifacts for your tasks to iterate over or use as inputs.

The `padv.builtin.query.FindCodeForModel` class is a `handle` class.

Creation

Description

`query = padv.builtin.query.FindCodeForModel()` creates a query for finding the generated code files and `buildInfo.mat` for a model.

`query = padv.builtin.query.FindCodeForModel(Name=Value)` sets certain properties using one or more name-value arguments. For example, `padv.builtin.query.FindCodeForModel(Name = "MyCodeQuery")` creates a query object with the name `"MyCodeQuery"`.

Note If you use this query as an input query and specify non-empty values for `IncludeLabel`, `ExcludeLabel`, `IncludePath`, or `ExcludePath`, your task results can unexpectedly become outdated. If you see this behavior, consider using a different query, like `padv.builtin.query.FindArtifacts`, instead. For more information and a list of queries that are not impacted by this limitation, see "Other Limitations".

The `padv.builtin.query.FindCodeForModel` class also has other properties, but you cannot set those properties during query creation.

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `query = padv.builtin.query.FindCodeForModel(Name = "MyCodeQuery")`

`ExcludeLabel` — Exclude artifacts with specific project label
cell array

Exclude artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Category","Label"}`

Data Types: `cell`

`ExcludePath` — Exclude artifacts where path contains specific text
string | character vector

Exclude artifacts where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `string`

`IncludeLabel` — Find artifacts with specific project label
cell array

Find artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Category","Label"}`

Data Types: `cell`

`IncludePath` — Find artifacts where path contains specific text
string

Find artifacts where the path contains specific text, specified as a string.

Example: `"Control"`

Data Types: `string`

`Name` — Unique identifier for query
string

Unique identifier for query, specified as a string.

Example: `"FindMyCode"`

Data Types: `string`

`Parent` — Initial query run before iteration query
`"padv.builtin.query.FindModels"` (default) | `padv.Query` object | `Name` of `padv.Query` object

Initial query run before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify a `padv.Query` object as the iteration query for a task, the `Parent` query is the initial query that the build system runs before running the specified iteration query.

The build system ignores the `Parent` query when you specify a query as an input query or dependency query for a task.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see “Best Practices for Process Model Authoring”.

Example: `padv.builtin.query.FindModels`

Example: `padv.builtin.query.FindModels(IncludePath = "Control")`

Properties

`IncludeLabel` — Find artifacts with specific project label
cell array

Find artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Category","Label"}`

Data Types: `cell`

`ExcludeLabel` — Exclude artifacts with specific project label
cell array

Exclude artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Category","Label"}`

Data Types: `cell`

`IncludePath` — Find artifacts where path contains specific text
string

Find artifacts where the path contains specific text, specified as a string.

Example: `"Control"`

Data Types: `string`

`ExcludePath` — Exclude artifacts where path contains specific text
string | character vector

Exclude artifacts where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `string`

`Title` — Query title
`"The generated code files for a given model"` (default) | string | character vector

Query title, specified as a string or a character vector.

Example: `"Find my generated code and buildInfo"`

Data Types: `string`

`DefaultArtifactType` — Default artifact type returned by query
`"sl_model_file"` (default) | `"zc_file"` | ...

Default artifact type returned by the query, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence

Artifact Type	Description
"sl_test_suite"	Simulink Test suite
"sl_test_suite_result"	Simulink Test suite result
"zc_block_diagram"	System Composer architecture
"zc_component"	System Composer architecture component
"zc_file"	System Composer architecture file

Example: "zc_file"

Example: ["sl_model_file" "zc_file"]

Parent — Initial query run before iteration query
"padv.builtin.query.FindModels" (default) | padv.Query object | Name of padv.Query object

Initial query run before iteration query, specified as either a padv.Query object or the Name of a padv.Query object. When you specify a padv.Query object as the iteration query for a task, the Parent query is the initial query that the build system runs before running the specified iteration query.

The build system ignores the Parent query when you specify a query as an input query or dependency query for a task.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see “Best Practices for Process Model Authoring”.

Example: padv.builtin.query.FindModels

Example: padv.builtin.query.FindModels(IncludePath = "Control")

Name — Unique identifier for query
string

Unique identifier for query, specified as a string.

Example: "FindMyCode"

Data Types: string

ShowFileExtension — Show file extensions for returned artifacts
0 (false) | 1 (true)

Show file extensions in the Alias property of returned artifacts, specified as a numeric or logical 1 (true) or 0 (false). The Alias property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the Alias property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property ShowFileExtension as true.

Example: true

Data Types: logical

SortArtifacts — Setting for automatically sorting artifacts by address
true or 1 (default) | false or 0

Setting for automatically sorting artifacts by address, specified as a numeric or logical `1` (`true`) or `0` (`false`). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal `sortArtifacts` method in a subclass that defines a custom sort behavior. For an example, see “Sort Artifacts in Specific Order”.

The build system automatically calls the `sortArtifacts` method when using the process model. The `sortArtifacts` method expects two input arguments: a `padv.Query` object and a list of `padv.Artifact` objects returned by the `run` method. The `sortArtifacts` method should return a list of sorted `padv.Artifact` objects.

Example: `SortArtifacts = false`

Data Types: `logical`

`FunctionHandle` — Handle to function that function-based query runs
`function_handle`

Handle to the function that a function-based query runs, specified as a `function_handle`.

If you define your query functionality inside a function and you or the build system call `run` on the query, the query runs the function specified by the `function_handle`.

The built-in queries are defined inside classes and do not use the `FunctionHandle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts` that are associated with the artifact `iterationArtifact`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,iterationArtifact)`
	`    ...`
	`end`

Examples

Find and Analyze Generated Code for Models

You can use the `FindCodeForModel` query in your process model to find generated code and `buildInfo.mat` files for your tasks to iterate over (`IterationQuery`) or use as inputs (`addInputQueries`). For example, you can use the `FindCodeForModel` query to find the code a code generation task, like `padv.builtin.task.GenerateCode`, generates and use those files as the input to a code analysis task like `padv.builtin.task.RunCodeInspection`.

Open a project. For this example, you can open the Process Advisor example project.

```
processAdvisorExampleStart
```

Suppose that you want to create one subprocess to contain your code generation tasks and another subprocess to contain your code analysis tasks. Your code analysis tasks need access to the generated code, but the tasks themselves cannot directly depend on the code generation task because that relationship would cross the subprocess boundary.

To pass the generated code from your code generation subprocess to your code analysis subprocess, you can update each of your code analysis tasks to find and use the generated model code as a task input by specifying `FindCodeForModel` as the input query for your code analysis tasks. Since the code analysis subprocess depends on the code that the code generation subprocess generates, you also need to specify a dependency between those subprocesses. For example, you can have the following process model:

```
function processmodel(pm)
    % Defines the project's processmodel
    arguments
        pm padv.ProcessModel
    end

    % Add "Code Generation" subprocess
    spCodeGen = pm.addSubprocess("Code Generation Tasks");
    spCodeGen.addTask(padv.builtin.task.GenerateCode);

    % Add "Code Analysis" subprocess
    spCodeAnalysis = pm.addSubprocess("Code Analysis Tasks");
    % Update task to find and use model code as an input to the task
    spCodeAnalysis.addTask(padv.builtin.task.RunCodeInspection(...
        InputQueries=padv.builtin.query.FindCodeForModel()));

    % Dependency between "Code Generation" and "Code Analysis" subprocesses
    spCodeAnalysis.dependsOn(spCodeGen);

end
```

For information on subprocesses and subprocess boundaries, see “Group Tasks Using Subprocesses”.

In Process Advisor, view the updated **Tasks** by clicking **Refresh Tasks** and switching to the **Project** view. When you run the code analysis task, the task automatically runs the code generation task and uses the generated code as an input for code analysis.

Note that in the previous example process model, the `GenerateCode` and `RunCodeInspection` tasks both use the same `FindModels` iteration query. To potentially improve process model loading times, you can share a single query object, in this case `findModels`, across the tasks.

```
function processmodel(pm)
    % Defines the project's processmodel

    arguments
        pm padv.ProcessModel
    end

    findModels = padv.builtin.query.FindModels(Name="ModelsQuery");

    % Add "Code Generation" subprocess
    spCodeGen = pm.addSubprocess("Code Generation Tasks");
    codeGenTask = spCodeGen.addTask(padv.builtin.task.GenerateCode(...
        IterationQuery = findModels));

    % Add "Code Analysis" subprocess
    spCodeAnalysis = pm.addSubprocess("Code Analysis Tasks");
    % Update task to find and use model code as an input to the task
    spCodeAnalysis.addTask(padv.builtin.task.RunCodeInspection(...
        IterationQuery = findModels,...
        InputQueries=padv.builtin.query.FindCodeForModel(Parent = findModels)));

    % Dependency between "Code Generation" and "Code Analysis" subprocesses
    spCodeAnalysis.dependsOn(spCodeGen);

end
```

For more information, see “Best Practices for Process Model Authoring”.

Capabilities and Limitations

This table identifies functionality that is supported by the query.

Functionality	Supported?
Input query for task	Yes.
Iteration query for task	Yes.

See Also

`padv.builtin.task.AnalyzeModelCode` | `padv.builtin.task.GenerateCode` | `padv.builtin.task.RunCodeInspection`

Topics

“Best Practices for Process Model Authoring”
“Group Tasks Using Subprocesses”

padv.builtin.query.FindDesignModels Class

Namespace: `padv.builtin.query padv.builtin.query`
Superclasses: `padv.Query`

Query for finding units and components

Description

The `padv.builtin.query.FindDesignModels` class provides a query that can return the units and components in your project. The query uses the same unit and component classification as the Model Design and Model Testing Dashboards. A unit is a functional entity in your software architecture that you can execute and test independently or as part of larger system tests. A component is an entity that integrates multiple testable units together. Some software development standards, like certain model maintainability objectives, apply to both units and components in a software architecture. You can use the `FindDesignModels` query to find the Simulink and System Composer models in your design that you need to assess. If you only need to find the units in your design, you can use the built-in query `padv.builtin.query.FindUnits` instead. For information how to classify the models in your project, see “Categorize Models in Hierarchy as Components or Units”.

You can use this query in your process model to find the units and components in your project and run tasks on those artifacts. For example, the built-in task `padv.builtin.task.CollectMetrics` can collect model maintainability metrics for the units and components in your project. The task uses `padv.builtin.query.FindDesignModels` as the iteration query to find and iterate over those units and components.

The `padv.builtin.query.FindDesignModels` class is a `handle` class.

Creation

Description

`query = padv.builtin.query.FindDesignModels()` creates a query for finding the units and components in your project.

`query = padv.builtin.query.FindDesignModels(Name=Value)` sets certain properties using one or more name-value arguments. For example, `query = padv.builtin.query.FindDesignModels(ExcludePath = "Control")` creates a query that finds the units and components in the project, but excludes units and components that have `"Control"` in the file address.

The `padv.builtin.query.FindDesignModels` class also has other properties, but you cannot set those properties during query creation.

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `query = padv.builtin.query.FindDesignModels(ExcludePath = "Control")`

`ExcludeLabel` — Exclude artifacts with specific project label
cell array

Exclude artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`ExcludePath` — Exclude artifacts where path contains specific text
string | character vector

Exclude artifacts where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `char` | `string`

`IncludeLabel` — Find artifacts with specific project label
cell array

Find artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePath` — Find artifacts where path contains specific text
string | character vector

Find artifacts where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `char` | `string`

`Name` — Unique identifier for query
string | character vector

Unique identifier for query, specified as a string or a character vector.

Example: `"FindUnitsAndComponents"`

Data Types: `char` | `string`

Properties

`IncludeLabel` — Find artifacts with specific project label
cell array

Find artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`ExcludeLabel` — Exclude artifacts with specific project label
cell array

Exclude artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePath` — Find artifacts where path contains specific text
string | character vector

Find artifacts where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `char` | `string`

`ExcludePath` — Exclude artifacts where path contains specific text
string | character vector

Exclude artifacts where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `char` | `string`

`Title` — Query title
`"All models under the hierarchy of Unit and Component models"` (default) | string | character vector

Query title, specified as a string or a character vector.

Example: `"Units and Components"`

Data Types: `char` | `string`

`DefaultArtifactType` — Default artifact type returned by query
`"sl_model_file"` (default) | `"zc_file"` | ...

Default artifact type returned by the query, specified as one or more of the values listed in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file

Artifact Type	Description
"m_class"	MATLAB class
"m_file"	MATLAB file
"m_func"	MATLAB function
"m_method"	MATLAB class method
"m_property"	MATLAB class property
"ma_config_file"	Model Advisor configuration file
"ma_justification_file"	Model Advisor justification file
"other_file"	Other file
"padv_output_file"	Process Advisor output file
"sf_chart"	Stateflow chart
"sf_graphical_fcn"	Stateflow graphical function
"sf_group"	Stateflow group
"sf_state"	Stateflow state
"sf_state_transition_chart"	Stateflow state transition chart
"sf_truth_table"	Stateflow truth table
"sl_block_diagram"	Block diagram
"sl_data_dictionary_file"	Data dictionary file
"sl_embedded_matlab_fcn"	MATLAB function
"sl_harness_block_diagram"	Harness block diagram
"sl_harness_file"	Test harness file
"sl_library_file"	Library file
"sl_model_file"	Simulink model file
"sl_protected_model_file"	Protected Simulink model file
"sl_req_table"	Requirements Table
"sl_subsystem"	Subsystem
"sl_subsystem_file"	Subsystem file
"sl_test_case"	Simulink Test case
"sl_test_case_result"	Simulink Test case result
"sl_test_file"	Simulink Test file
"sl_test_iteration"	Simulink Test iteration
"sl_test_iteration_result"	Simulink Test iteration result
"sl_test_report_file"	Simulink Test result report
"sl_test_result_file"	Simulink Test result file
"sl_test_resultset"	Simulink Test result set
"sl_test_seq"	Test Sequence
"sl_test_suite"	Simulink Test suite

Artifact Type	Description
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

Example: `"zc_file"`

Example: `["sl_model_file" "zc_file"]`

`Parent` — Query that build system can run first
`padv.Query` object | Name of `padv.Query` object

Query that the build system can run first, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object.

If you use `padv.builtin.query.FindDesignModels` as an iteration query in your process model, the build system automatically runs the `Parent` query first. If there is an existing query that you want the build system to run first, specify that query as the `Parent` query. For example, the built-in query `FindModelsWithTestCases` specifies `FindModels` as a `Parent` query .

If you use `padv.builtin.query.FindDesignModels` as an input query or dependency query for a task, the build system ignores the `Parent` query.

`Name` — Unique identifier for query
string | character vector

Unique identifier for query, specified as a string or a character vector.

Example: `"FindUnitsAndComponents"`

Data Types: `char` | `string`

`ShowFileExtension` — Show file extensions for returned artifacts
`0 (false)` | `1 (true)`

Show file extensions in the `Alias` property of returned artifacts, specified as a numeric or logical `1` (`true`) or `0` (`false`). The `Alias` property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the `Alias` property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property `ShowFileExtension` as `true`.

Example: `true`

Data Types: `logical`

`SortArtifacts` — Setting for automatically sorting artifacts by address
`true` or `1` (default) | `false` or `0`

Setting for automatically sorting artifacts by address, specified as a numeric or logical `1` (`true`) or `0` (`false`). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal `sortArtifacts` method in a subclass that defines a custom sort behavior. For an example, see "Sort Artifacts in Specific Order" in the User's Guide PDF.

The build system automatically calls the `sortArtifacts` method when using the process model. The `sortArtifacts` method expects two input arguments: a `padv.Query` object and a list of `padv.Artifact` objects returned by the `run` method. The `sortArtifacts` method should return a list of sorted `padv.Artifact` objects.

Example: `SortArtifacts = false`

Data Types: `logical`

`FunctionHandle` — Handle to function that function-based query runs
`function_handle`

Handle to the function that a function-based query runs, specified as a `function_handle`.

If you define your query functionality inside a function and you or the build system call `run` on the query, the query runs the function specified by the `function_handle`.

The built-in queries are defined inside classes and do not use the `FunctionHandle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,~)`
	`    ...`
	`end`

Examples

Find Design Models for Task in Process

You can use the `FindDesignModels` query in your process model to find units and components that your tasks can iterate over (`IterationQuery`). Suppose you have a custom task that you want to run for each unit and component in your project. You can find the units and components in your project by using the built-in query `FindDesignModels`.

Open a project. For this example, open the Process Advisor example project.

```
processAdvisorExampleStart
```

To have the custom task run for each unit and component, specify the query as the iteration query for the task. For example, in your process model:

```
pm.addTask("MyCustomTask",...
    IterationQuery = padv.builtin.query.FindDesignModels);
```

In Process Advisor, view the updated **Tasks** by clicking **Refresh Tasks** and switching to the **Project** view. For the task `MyCustomTask`, there is one task iteration for each unit and component in the project. The Process Advisor example project contains the component `Flight_Control` and four units `AHRS_Voter`, `Actuator_Control`, `InnerLoop_Control`, and `OuterLoop_Control`.

To view how the example project is classifying units and components, open the options for the Model Testing Dashboard.

```
modelTestingDashboard
```

In the dashboard toolstrip, click **Options**. The **Classification** section shows that the digital thread classifies models with the project label `Software Component` as components and models with the project label `Software Unit` as units.

For information how to classify the models in your project, see “Categorize Models in Hierarchy as Components or Units”.

Test Query Locally in Command Window

If you want to test a query before using the query in your process model, you can run the query directly from the MATLAB Command Window.

Open a project. For this example, open the Process Advisor example project.

```
processAdvisorExampleStart
```

In the MATLAB Command Window, create a query object that represents the query.

```
q = padv.builtin.query.FindDesignModels;
```

Run the query by using the `run` method. The query returns the artifacts that it finds as a `padv.Artifact` object or an array of `padv.Artifact` objects.

```
artifacts = q.run
```

```
artifacts = 

  1×5 Artifact array with properties:

    Type
    Parent
    ArtifactAddress
    Alias
```

You can inspect the properties of each `padv.Artifact` object to view information about the artifact. For example, you can use the `Alias` property to view the artifact names.

```
artifacts.Alias
```

```
ans = 

    "Flight_Control.slx"


ans = 

    "AHRS_Voter.slx"


ans = 

    "Actuator_Control.slx"


ans = 
    "OuterLoop_Control.slx"


ans = 

    "InnerLoop_Control.slx"
```

The `Alias` property returns the artifact names as they appear in Process Advisor.

Capabilities and Limitations

This table identifies functionality that is supported by the query.

Functionality	Supported?
Input query for task	No.
Iteration query for task	Yes. See IterationQuery.

See Also

`padv.Artifact` | `padv.builtin.task.CollectMetrics` | `padv.builtin.query.FindUnits`

Topics

"Categorize Models in Hierarchy as Components or Units"

padv.builtin.query.FindExternalCodeCache Class

Namespace: `padv.builtin.query padv.builtin.query`
Superclasses: `padv.Query`, `padv.builtin.query.FindArtifacts`

Query for finding external code cache files in project folder

Description

The `padv.builtin.query.FindExternalCodeCache` class provides a query that can return the external code cache files (`.slxc.bk`) in your project folder. You can automatically include or exclude certain files by using the optional name-value arguments.

You can use this query in your process model to find artifacts for your tasks to use as inputs. For example, you can use this query to the find external code cache files that you generate using the built-in task `padv.builtin.task.GenerateCode`. The built-in task `padv.builtin.task.GenerateCode` generates an external code cache when you specify the task property `GenerateExternalCodeCache` as `true`. To unpack the code generation target from the cache files, you can use the utility function `padv.util.unpackExternalCodeCache`.

The `padv.builtin.query.FindExternalCodeCache` class is a `handle` class.

Creation

Description

`query = padv.builtin.query.FindExternalCodeCache()` creates a query for finding the external code cache files (`.slxc.bk`) in your project folder.

`query = padv.builtin.query.FindExternalCodeCache(Name = queryName)` specifies a new name, `queryName`, for the query object. Each query in the process model must have a unique name.

The `padv.builtin.query.FindExternalCodeCache` class also has other properties, but you cannot set those properties during query creation.

Input Arguments

`queryName` — Unique identifier for query
string

Unique identifier for query, specified as a string.

This argument specifies the value for the `Name` property.

Example: `"FindMyExternalCodeCache"`

Data Types: `string`

Properties

`ArtifactType` — Type of artifact
`"slxc_bak_file"` (default) | `"other_file"` | ...

Type of artifact, specified as one or more of the values in this table. To specify multiple values, use a cell array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration

Artifact Type	Description
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

Example: `"slxc_bak_file"`

Example: `["slxc_bak_file" "other_file"]`

`IncludeLabel` — Find artifacts with specific project label
cell array

Find artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`ExcludeLabel` — Exclude artifacts with specific project label
cell array

Exclude artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePathRegex` — Find artifacts where path matches regular expression pattern
string | character vector

Find artifacts where the path matches a regular expression pattern, specified as a character vector or string. `IncludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `IncludePath` instead. You can specify either `IncludePath` or `IncludePathRegex` but not both.

Example: `"modelNamePrefix_.*\.slxc.bk"`

Data Types: `char` | `string`

`ExcludePathRegex` — Exclude artifacts where path matches regular expression pattern
string | character vector

Exclude artifacts where the path matches a regular expression pattern, specified as a string or a character vector. `ExcludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `ExcludePath` instead. You can specify either `ExcludePath` or `ExcludePathRegex` but not both.

Example: `"modelNamePrefix_.*\.slxc.bk"`

Data Types: `char` | `string`

`FilterSubFileArtifacts` — Filter out sub-file artifacts from query results
`1` (`true`) (default) | `0` (`false`)

Filter out sub-file artifacts from query results, specified as a numeric or logical `1` (`true`) or `0` (`false`).

A sub-file is a part of a larger file. For example, a subsystem is a sub-file of a model file.

Example: `false`

Data Types: `logical`

`InProject` — Include only artifacts added to project
`0` (`false`) (default) | `1` (`true`)

Include only artifacts that have been added to the project, specified as a numeric or logical `1` (`true`) or `0` (`false`).

For more information about how to add or remove files from a project, see “Add Files to the Project”.

Example: `true`

Data Types: `logical`

`Title` — Query title
`"All generated external code cache files"` (default) | string | character vector

Query title, specified as a string or a character vector.

Example: `"Find my external code cache files"`

Data Types: `string`

`DefaultArtifactType` — Default artifact type returned by query
`"slxc_bak_file"` (default) | `"other_file"` | ...

Default artifact type returned by the query, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file

Artifact Type	Description
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

Example: `"slxc_bak_file"`

Example: `["slxc_bak_file" "other_file"]`

Parent — Initial query that runs before iteration query
string.empty() (default) | padv.Query | Name of padv.Query object

You cannot use FindExternalCodeCache as an iteration query, so the build system does not use the parent query.

Name — Unique identifier for query
string

Unique identifier for query, specified as a string.

Example: "FindMyExternalCodeCache"

Data Types: string

ShowFileExtension — Show file extensions for returned artifacts
0 (false) | 1 (true)

Show file extensions in the Alias property of returned artifacts, specified as a numeric or logical 1 (true) or 0 (false). The Alias property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the Alias property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property ShowFileExtension as true.

Example: true

Data Types: logical

SortArtifacts — Setting for automatically sorting artifacts by address
true or 1 (default) | false or 0

Setting for automatically sorting artifacts by address, specified as a numeric or logical 1 (true) or 0 (false). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal sortArtifacts method in a subclass that defines a custom sort behavior. For an example, see "Sort Artifacts in Specific Order" in the User's Guide PDF.

The build system automatically calls the sortArtifacts method when using the process model. The sortArtifacts method expects two input arguments: a padv.Query object and a list of padv.Artifact objects returned by the run method. The sortArtifacts method should return a list of sorted padv.Artifact objects.

Example: SortArtifacts = false

Data Types: logical

FunctionHandle — Handle to function that function-based query runs
function_handle

Handle to the function that a function-based query runs, specified as a function_handle.

If you define your query functionality inside a function and you or the build system call run on the query, the query runs the function specified by the function_handle.

The built-in queries are defined inside classes and do not use the `FunctionHandle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,~)`
	`    ...`
	`end`

Examples

Find and Unpack Cache Files for Task in Process

You can use the `FindExternalCodeCache` query in your task definition to find and unpack external code cache files. For example, suppose your team generates code in parallel by generating an external code cache, downstream tasks that depend on the generated code need to unpack the generated code target before performing the main task action. If you have a custom task that depends on that generated code, you can find the external code cache files by using the built-in query `FindExternalCodeCache` and unpack the code generation target by using the utility function `padv.util.unpackExternalCodeCache`.

Inside your task definition, you can find external code cache files by creating and running a `FindExternalCodeCache` query object. For example:

```
% Before main task action, access the generated code
% by finding and unpacking the external code cache
```

```
q = padv.builtin.query.FindExternalCodeCache;
artifactsArray = run(q);
    if ~isempty(artifactsArray)
        padv.util.unpackExternalCodeCache(artifactsArray)
    end

% <definition for main task action that uses the generated code>
```

For more information about parallel code generation and external code caches, see the GenerateExternalCodeCache property for the built-in task `padv.builtin.task.GenerateCode`. The external code cache allows your team to generate code in parallel while maintaining up-to-date task results.

Test `FindExternalCodeCache` Query Outside Process Model

Although you typically use a query inside your process model, you can run an instance of the `FindExternalCodeCache` query outside of your process model to confirm which artifacts the query returns.

Open the parallel code generation example.

```
processAdvisorParallelExampleStart
```

Generate code by running a code generation task iteration. For example, run the code generation task on the reference model `OuterLoop_Control`.

```
runprocess(Tasks = "padv.builtin.task.GenerateCode", ...
    FilterArtifact = fullfile("02_Models","OuterLoop_Control", ...
    "specification","OuterLoop_Control.slx"));
```

Find the external code cache file by using the built-in query.

```
q = padv.builtin.query.FindExternalCodeCache;
artifactsArray = run(q);
```

Unpack the cache file.

```
padv.util.unpackExternalCodeCache(artifactsArray);
```

Capabilities and Limitations

This table identifies functionality that is supported by the query.

Functionality	Supported?
Input query for task	Yes.
Iteration query for task	No.

See Also

`padv.builtin.task.GenerateCode` | `padv.util.unpackExternalCodeCache`

padv.builtin.query.FindFilesWithLabel Class

Namespace: `padv.builtin.query padv.builtin.query`
Superclasses: `padv.Query`, `padv.builtin.query.FindArtifacts`

Query for finding files with project label

Description

The `padv.builtin.query.FindFilesWithLabel` class provides a query that can return files that use the specified project label. You can automatically include or exclude certain files by using the optional name-value arguments. If you do not need to specify a project label, you can use a built-in query like `padv.builtin.query.FindFileWithAddress` or `padv.builtin.query.FindArtifacts` instead.

You can use this query in your process model to find files for your tasks to iterate over.

The `padv.builtin.query.FindFilesWithLabel` class is a `handle` class.

Creation

Description

`query = padv.builtin.query.FindFilesWithLabel(categoryName,labelName)` creates a query for finding files that use the project label `labelName` from the project label category `categoryName`. For more information about project labels, see “Add Labels to Project Files”.

`query = padv.builtin.query.FindFilesWithLabel( ___ ,Name=Value)` sets certain properties using one or more name-value arguments. For example, `padv.builtin.query.FindFilesWithLabel("Classification","Design",Name = "FindMyLabeledFiles")` creates a query with the name `"FindMyLabeledFiles"`.

The `padv.builtin.query.FindFilesWithLabel` class also has other properties, but you cannot set those properties during query creation.

Input Arguments

`categoryName` — Name of category for project label
string | character vector

Name of the category for the project label, specified as a string or a character vector.

The query uses `categoryName` to specify the first entry for the query property `IncludeLabel`. For more information about project labels, see “Add Labels to Project Files”.

Example: `"Classification"`

Data Types: `char` | `string`

`labelName` — Name of project label
string | character vector

Name of project label, specified as a string or a character vector.

The query uses `labelName` to specify the second entry for the query property `IncludeLabel`. For more information about project labels, see “Add Labels to Project Files”.

Example: `"Design"`

Data Types: `char` | `string`

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `query = padv.builtin.query.FindFilesWithLabel("Classification","Design",Name = "FindMyLabeledFiles")`

`ExcludeLabel` — Exclude files with specific project label
cell array

Exclude files with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

For more information about project labels, see “Add Labels to Project Files”.

Example: `{"Classification","Design"}`

Data Types: `cell`

`ExcludePath` — Exclude files where path contains specific text
string | character vector

Exclude files where the path contains specific text, specified as a string or a character vector. Consider using `ExcludePathRegex` instead.

Example: `"Control"`

Data Types: `string`

`ExcludePathRegex` — Exclude files where path matches regular expression pattern
string | character vector

Exclude files where the path matches a regular expression pattern, specified as a string or a character vector. `ExcludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `ExcludePath` instead. You can specify either `ExcludePath` or `ExcludePathRegex` but not both.

Data Types: `char` | `string`

`IncludeLabel` — Find files with specific project label
cell array

Find files with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Alternatively, you can specify the first and second entries using the arguments `categoryName` and `labelName`. The query uses those arguments to specify the entries for `IncludeLabel`. For more information about project labels, see “Add Labels to Project Files”.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePath` — Find files where path contains specific text
string | character vector

Find files where the path contains specific text, specified as a string. Consider using `IncludePathRegex` instead.

Example: `"Control"`

Data Types: `char` | `string`

`IncludePathRegex` — Find files where path matches regular expression pattern
string | character vector

Find files where the path matches a regular expression pattern, specified as a character vector or string. `IncludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `IncludePath` instead. You can specify either `IncludePath` or `IncludePathRegex` but not both.

Data Types: `char` | `string`

`Name` — Unique identifier for query
string | character vector

Unique identifier for query, specified as a string or a character vector.

Example: `"FindMyLabeledFiles"`

Data Types: `char` | `string`

Properties

`ArtifactType` — Type of artifact
`"m_file"` | `"other_file"` | ...

Type of artifact, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property

Artifact Type	Description
"ma_config_file"	Model Advisor configuration file
"ma_justification_file"	Model Advisor justification file
"other_file"	Other file
"padv_output_file"	Process Advisor output file
"sf_chart"	Stateflow chart
"sf_graphical_fcn"	Stateflow graphical function
"sf_group"	Stateflow group
"sf_state"	Stateflow state
"sf_state_transition_chart"	Stateflow state transition chart
"sf_truth_table"	Stateflow truth table
"sl_block_diagram"	Block diagram
"sl_data_dictionary_file"	Data dictionary file
"sl_embedded_matlab_fcn"	MATLAB function
"sl_harness_block_diagram"	Harness block diagram
"sl_harness_file"	Test harness file
"sl_library_file"	Library file
"sl_model_file"	Simulink model file
"sl_protected_model_file"	Protected Simulink model file
"sl_req_table"	Requirements Table
"sl_subsystem"	Subsystem
"sl_subsystem_file"	Subsystem file
"sl_test_case"	Simulink Test case
"sl_test_case_result"	Simulink Test case result
"sl_test_file"	Simulink Test file
"sl_test_iteration"	Simulink Test iteration
"sl_test_iteration_result"	Simulink Test iteration result
"sl_test_report_file"	Simulink Test result report
"sl_test_result_file"	Simulink Test result file
"sl_test_resultset"	Simulink Test result set
"sl_test_seq"	Test Sequence
"sl_test_suite"	Simulink Test suite
"sl_test_suite_result"	Simulink Test suite result
"zc_block_diagram"	System Composer architecture
"zc_component"	System Composer architecture component
"zc_file"	System Composer architecture file

Example: "m_file"

Example: `["m_file" "other_file"]`

`IncludeLabel` — Find files with specific project label
cell array

Find files with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Alternatively, you can specify the first and second entries using the arguments `categoryName` and `labelName`. The query uses those arguments to specify the entries for `IncludeLabel`. For more information about project labels, see “Add Labels to Project Files”.

Example: `{"Classification","Design"}`

Data Types: `cell`

`ExcludeLabel` — Exclude files with specific project label
cell array

Exclude files with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

For more information about project labels, see “Add Labels to Project Files”.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePathRegex` — Find files where path matches regular expression pattern
string | character vector

Find files where the path matches a regular expression pattern, specified as a string or character vector. `IncludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `IncludePath` instead. You can specify either `IncludePath` or `IncludePathRegex` but not both.

Data Types: `char` | `string`

`ExcludePathRegex` — Exclude files where path matches regular expression pattern
string | character vector

Exclude files where the path matches a regular expression pattern, specified as a string or a character vector. `ExcludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `ExcludePath` instead. You can specify either `ExcludePath` or `ExcludePathRegex` but not both.

Data Types: `char` | `string`

`FilterSubFileArtifacts` — Filter out sub-file artifacts from query results
`1` (`true`) (default) | `0` (`false`)

Filter out sub-file artifacts from query results, specified as a numeric or logical `1` (`true`) or `0` (`false`).

A sub-file is a part of a larger file. For example, a subsystem is a sub-file of a model file.

Example: `false`

Data Types: `logical`

`InProject` — Include only files added to project

`0` (`false`) (default) | `1` (`true`)

Include only files that have been added to the project, specified as a numeric or logical `1` (`true`) or `0` (`false`).

For more information about how to add or remove files from a project, see “Add Files to the Project”

Example: `true`

Attributes:

`Dependent`

Data Types: `logical`

`Title` — Query title

`"All files with label ''"` (default) | string | character vector

Query title, specified as a string or a character vector.

When you specify a project label name, the query automatically updates the `Title` to include that project label name. For example, `"All files with label 'Design'"`.

Example: `"Find my labeled files"`

Data Types: `string`

`DefaultArtifactType` — Default artifact type returned by query

`"padv_output_file"` (default) | `"m_file"` | `"other_file"` | ...

Default artifact type returned by the query, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function

Artifact Type	Description
"sf_group"	Stateflow group
"sf_state"	Stateflow state
"sf_state_transition_chart"	Stateflow state transition chart
"sf_truth_table"	Stateflow truth table
"sl_block_diagram"	Block diagram
"sl_data_dictionary_file"	Data dictionary file
"sl_embedded_matlab_fcn"	MATLAB function
"sl_harness_block_diagram"	Harness block diagram
"sl_harness_file"	Test harness file
"sl_library_file"	Library file
"sl_model_file"	Simulink model file
"sl_protected_model_file"	Protected Simulink model file
"sl_req_table"	Requirements Table
"sl_subsystem"	Subsystem
"sl_subsystem_file"	Subsystem file
"sl_test_case"	Simulink Test case
"sl_test_case_result"	Simulink Test case result
"sl_test_file"	Simulink Test file
"sl_test_iteration"	Simulink Test iteration
"sl_test_iteration_result"	Simulink Test iteration result
"sl_test_report_file"	Simulink Test result report
"sl_test_result_file"	Simulink Test result file
"sl_test_resultset"	Simulink Test result set
"sl_test_seq"	Test Sequence
"sl_test_suite"	Simulink Test suite
"sl_test_suite_result"	Simulink Test suite result
"zc_block_diagram"	System Composer architecture
"zc_component"	System Composer architecture component
"zc_file"	System Composer architecture file

Example: "m_file"

Example: ["m_file" "other_file"]

Parent — Initial query that runs before iteration query
padv.Query | Name of padv.Query object

Initial query that runs before iteration query, specified as either a padv.Query object or the Name of a padv.Query object. When you specify an iteration query for a task, the parent query is the initial query that the build system runs before running the specified iteration query.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see "Best Practices for Process Model Authoring" in the User's Guide PDF.

Example: `sharedQuery`

Example: `"FindMyInitialArtifacts"`

`ShowFileExtension` — Show file extensions for returned files
`0` (`false`) | `1` (`true`)

Show file extensions in the `Alias` property of returned files, specified as a numeric or logical `1` (`true`) or `0` (`false`). The `Alias` property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the `Alias` property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property `ShowFileExtension` as `true`.

Example: `true`

Data Types: `logical`

`SortArtifacts` — Setting for automatically sorting artifacts by address
`true` or `1` (default) | `false` or `0`

Setting for automatically sorting artifacts by address, specified as a numeric or logical `1` (`true`) or `0` (`false`). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal `sortArtifacts` method in a subclass that defines a custom sort behavior. For an example, see "Sort Artifacts in Specific Order" in the User's Guide PDF.

The build system automatically calls the `sortArtifacts` method when using the process model. The `sortArtifacts` method expects two input arguments: a `padv.Query` object and a list of `padv.Artifact` objects returned by the `run` method. The `sortArtifacts` method should return a list of sorted `padv.Artifact` objects.

Example: `SortArtifacts = false`

Data Types: `logical`

`FunctionHandle` — Handle to function that function-based query runs
`function_handle`

Handle to the function that a function-based query runs, specified as a `function_handle`.

If you define your query functionality inside a function and you or the build system call `run` on the query, the query runs the function specified by the `function_handle`.

The built-in queries are defined inside classes and do not use the `FunctionHandle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,~)`
	`    ...`
	`end`

Examples

Find Files with Specific Project Label

Suppose that you have a project that contains several MATLAB scripts and you want a custom task to only run for MATLAB script files with a specific project label.

In your process model, you can use the `FindFilesWithLabel` query in your task definition to find files that your tasks can iterate over (`IterationQuery`). For example, if the scripts that you want to run the task on use the project label `ProjectTooling` from the project label category `Tools`:

```
taskObj = addTask(pm, "MyCustomTask",...
    IterationQuery = padv.builtin.query.FindFilesWithLabel(...
    "Tools","ProjectTooling"),...
    InputQueries = padv.builtin.query.GetIterationArtifact);
```

When you specify `InputQueries` as `padv.builtin.query.GetIterationArtifact`, that allows the task to use the artifacts returned by `IterationQuery` as inputs to the task.

In Process Advisor, view the updated **Tasks** by clicking **Refresh Tasks** and switching to the **Project** view. For the task `MyCustomTask`, there is one task iteration for each file with the `ProjectTooling` project label.

Test `FindFilesWithLabel` Query Outside Process Model

Although you typically use a query inside your process model, you can run an instance of the `FindFilesWithLabel` query outside of your process model to confirm which artifacts the query returns.

Open a project. For this example, you can open the Process Advisor example project.

```
processAdvisorExampleStart
```

Create an instance of the query. You can use the arguments of the query to filter the query results. For example, to find files that use the `Design` project label from the `Classification` project label category:

```
q = padv.builtin.query.FindFilesWithLabel("Classification","Design");
```

Run the query and inspect the array of artifacts that the query returns.

```
run(q)
```

```
ans = 

  1×24 Artifact array with properties:

    Type
    Parent
    ArtifactAddress
    Alias
```

The `ArtifactAddress` property contains the address of the file. If you only need to find a specific file at a specific address, you can use the built-in query `padv.builtin.query.FindFileWithAddress` instead.

Capabilities and Limitations

This table identifies functionality that is supported by the query.

Functionality	Supported?
Input query for task	No.
Iteration query for task	Yes.

See Also

`padv.builtin.query.FindArtifacts` | `padv.builtin.query.FindFileWithAddress`

padv.builtin.query.FindFileWithAddress Class

Namespace: `padv.builtin.query padv.builtin.query`
Superclasses: `padv.Query`

Query for finding file with address

Description

The `padv.builtin.query.FindFileWithAddress` class provides a query that can return the file at the specified address in the project. You can specify additional settings by using the optional name-value arguments.

You can use this query in your process model to find artifacts for your tasks to iterate over or use as inputs. For example, you can use this query to find a Model Advisor configuration file to use with the built-in task `padv.builtin.task.RunModelStandards`.

The `padv.builtin.query.FindFileWithAddress` class is a `handle` class.

Creation

Description

`q = padv.builtin.query.FindFileWithAddress(Type = ArtifactType,Path = FilePath)` finds a file, of type `ArtifactType`, at the address specified by `FilePath`.

`q = padv.builtin.query.FindFileWithAddress( ___ ,Name=Value)` finds and returns a file using the settings specified by one or more name-value arguments. For example, if you do not want the build system to track changes to the returned file, specify `TrackArtifacts=false`.

The `padv.builtin.query.FindFileWithAddress` class also has other properties, but you cannot set those properties during query creation.

Input Arguments

`ArtifactType` — Type of artifact
`"padv_output_file"` (default) | `"ma_config_file"` | `"m_file"` | ...

Type of artifact, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method

Artifact Type	Description
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

The `Type` argument controls the `DefaultArtifactType` property value.

Example: `"ma_config_file"`

Example: `["sl_model_file" "m_file"]`

`FilePath` — Path to file
string | character vector | cell array of character vectors

Path to file, specified as a string, a character vector, or a cell array of character vectors.

Example: `fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx")`

Example: `[fullfile("myFiles","myModel.slx"), fullfile("myFiles","myScript.m")]`

Data Types: `char` | `string` | `cell`

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `query = padv.builtin.query.FindCodeForModel(Name = "MyCodeQuery")`

`Name` — Unique identifier for query
string

Unique identifier for query, specified as a string.

Example: `"FindMyFile"`

Data Types: `string`

`Type` — Type of artifact
`"padv_output_file"` (default) | `"ma_config_file"` | `"m_file"` | ...

Type of artifact, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function

Artifact Type	Description
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

The `Type` argument controls the `DefaultArtifactType` property value.

Example: `"ma_config_file"`

Example: `["sl_model_file" "m_file"]`

`Path` — Path to file
string | character vector | cell array of character vectors

Path to file, specified as a string, a character vector, or a cell array of character vectors.

Example: `fullfile("tools","sampleChecks.json")`

Example: `[fullfile("myFiles","myModel.slx"), fullfile("myFiles","myScript.m")]`

Data Types: `char` | `string` | `cell`

`ValidateFileExistence` — Validate that file exists before returning in query results
`1` (`true`) (default) | `0` (`false`)

Validate that the file exists before attempting to return the file in the query results, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`TrackArtifacts` — Setting that controls whether build system tracks changes to file the query returns
`1` (`true`) (default) | `0` (`false`)

Setting that controls whether the build system tracks changes to the file the query returns, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

Properties

`Path` — Path to file
string | character vector | cell array of character vectors

Path to file, specified as a string, a character vector, or a cell array of character vectors.

Example: `fullfile("tools","sampleChecks.json")`

Example: `[fullfile("myFiles","myModel.slx"), fullfile("myFiles","myScript.m")]`

Data Types: `char` | `string` | `cell`

`ValidateFileExistence` — Validate that file exists before returning in query results
`1` (`true`) (default) | `0` (`false`)

Validate that the file exists before attempting to return the file in the query results, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

`TrackArtifacts` — Setting that controls whether build system tracks changes to file the query returns
`1` (`true`) (default) | `0` (`false`)

Setting that controls whether the build system tracks changes to the file the query returns, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Example: `false`

Data Types: `logical`

Title — Query title
"Files: ''" (default) | string | character vector

Query title, specified as a string or a character vector.

Example: "Files: 'tools\sampleChecks.json'"

Data Types: string

DefaultArtifactType — Type of artifact
"padv_output_file" (default) | "ma_config_file" | "m_file" | ...

Type of artifact, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
"harness_info_file"	Harness info file
"m_class"	MATLAB class
"m_file"	MATLAB file
"m_func"	MATLAB function
"m_method"	MATLAB class method
"m_property"	MATLAB class property
"ma_config_file"	Model Advisor configuration file
"ma_justification_file"	Model Advisor justification file
"other_file"	Other file
"padv_output_file"	Process Advisor output file
"sf_chart"	Stateflow chart
"sf_graphical_fcn"	Stateflow graphical function
"sf_group"	Stateflow group
"sf_state"	Stateflow state
"sf_state_transition_chart"	Stateflow state transition chart
"sf_truth_table"	Stateflow truth table
"sl_block_diagram"	Block diagram
"sl_data_dictionary_file"	Data dictionary file
"sl_embedded_matlab_fcn"	MATLAB function
"sl_harness_block_diagram"	Harness block diagram
"sl_harness_file"	Test harness file
"sl_library_file"	Library file
"sl_model_file"	Simulink model file
"sl_protected_model_file"	Protected Simulink model file
"sl_req_table"	Requirements Table
"sl_subsystem"	Subsystem
"sl_subsystem_file"	Subsystem file

Artifact Type	Description
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

The `Type` argument controls the `DefaultArtifactType` property value.

Example: `"ma_config_file"`

Example: `["sl_model_file" "m_file"]`

`Parent` — Initial query run before iteration query
`padv.Query` object | `Name` of `padv.Query` object

Initial query run before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify a `padv.Query` object as the iteration query for a task, the `Parent` query is the initial query that the build system runs before running the specified iteration query.

The build system ignores the `Parent` query when you specify a query as an input query or dependency query for a task.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see “Best Practices for Process Model Authoring”.

Example: `padv.builtin.query.FindModels`

Example: `padv.builtin.query.FindModels(IncludePath = "Control")`

`Name` — Unique identifier for query
string

Unique identifier for query, specified as a string.

Example: `"FindMyFile"`

Data Types: `string`

`ShowFileExtension` — Show file extensions for returned artifacts
`0` (`false`) | `1` (`true`)

Show file extensions in the `Alias` property of returned artifacts, specified as a numeric or logical `1` (`true`) or `0` (`false`). The `Alias` property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the `Alias` property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property `ShowFileExtension` as `true`.

Example: `true`

Data Types: `logical`

`SortArtifacts` — Setting for automatically sorting artifacts by address
`true` or `1` (default) | `false` or `0`

Setting for automatically sorting artifacts by address, specified as a numeric or logical `1` (`true`) or `0` (`false`). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal `sortArtifacts` method in a subclass that defines a custom sort behavior. For an example, see "Sort Artifacts in Specific Order".

The build system automatically calls the `sortArtifacts` method when using the process model. The `sortArtifacts` method expects two input arguments: a `padv.Query` object and a list of `padv.Artifact` objects returned by the `run` method. The `sortArtifacts` method should return a list of sorted `padv.Artifact` objects.

Example: `SortArtifacts = false`

Data Types: `logical`

`FunctionHandle` — Handle to function that function-based query runs
`function_handle`

Handle to the function that a function-based query runs, specified as a `function_handle`.

If you define your query functionality inside a function and you or the build system call `run` on the query, the query runs the function specified by the `function_handle`.

The built-in queries are defined inside classes and do not use the `FunctionHandle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,~)`
	`    ...`
	`end`

Examples

Find and Use Model Advisor Configuration File

By default, the `RunModelStandards` task runs a subset of high-integrity checks. If you want the task to run the Model Advisor checks specified by the Model Advisor configuration file, you can add the configuration file as an input to the task.

Open a project. For this example, you can open the Process Advisor example project.

```
processAdvisorExampleStart
```

Edit the process model to use the following process model instead.

```
function processmodel(pm)
    % Defines the project's processmodel

    arguments
        pm padv.ProcessModel
    end

    % Add built-in task for Checking Modeling Standards
    maTask = pm.addTask(padv.builtin.task.RunModelStandards);

    % Reconfigure task to specify which Model Advisor configuration to use
    maTask.addInputQueries(padv.builtin.query.FindFileWithAddress( ...
        Type = "ma_config_file",...
        Path = fullfile("tools","sampleChecks.json")));

end
```

This process model finds the Model Advisor configuration file by using the query `FindFileWithAddress` and then specifies that query as the input query for the built-in task `RunModelStandards` by using the `addInputQueries` function.

For the `FindFileWithAddress` query:

- The first argument, `"ma_config_file"`, specifies that the file is a Model Advisor configuration file.
- The second argument specifies the path to the Model Advisor configuration file. In this example, the configuration file is a file, `sampleChecks.json`, in the `tools` folder in the project.

Find Multiple Files

To find multiple files by their addresses, you can use vectors of the same length.

For example, to find a Model Advisor configuration file and a model file by using the same query, specify the artifact type (`Type`) and the file path (`Path`) using vectors of the same length. For example:

```
padv.builtin.query.FindFileWithAddress(...
    Type=["ma_config_file", "sl_model_file"],...
    Path=[fullfile("tools","sampleChecks.json"),...
        fullfile("02_Models","AHRS_Voter","specification","AHRS_Voter.slx")])
```

If you only specify one value for `Type`, the query uses the same artifact type for each specified file specified by `Path`. For example, the following query finds two Model Advisor configuration files.

```
padv.builtin.query.FindFileWithAddress(...
    Type="ma_config_file",...
    Path=[fullfile("tools","sampleChecks.json"), fullfile("tools","myCustomChecks.json")])
```

Test `FindFileWithAddress` Query

Although you typically use queries inside your process model, you can run `FindFileWithAddress` queries outside of your process model to confirm which artifacts a query returns.

Open a project. For this example, you can open the Process Advisor example project.

```
processAdvisorExampleStart
```

Create an instance of the query. For example, create a query that finds a file with the artifact type Model Advisor configuration file (`ma_config_file`) at the file path specified by `fullfile("tools","sampleChecks.json")`.

```
q = padv.builtin.query.FindFileWithAddress( ...
    Type = "ma_config_file",...
    Path = fullfile("tools","sampleChecks.json"))
```

Run the query.

```
run(q)
```

The query returns the specified artifact.

```
ans = 

    "tools\sampleChecks.json"
```

Capabilities and Limitations

This table identifies functionality that is supported by the query.

Functionality	Supported?
Input query for task	Yes.
Iteration query for task	Yes.

See Also

`padv.builtin.task.RunModelStandards` | `padv.builtin.query.FindFilesWithLabel`

padv.builtin.query.FindMAJustificationFileForModel Class

Namespace: `padv.builtin.query padv.builtin.query`
Superclasses: `padv.Query`

Query for finding Model Advisor justification file for model

Description

The `padv.builtin.query.FindMAJustificationFileForModel` class provides a query that can return the Model Advisor justification file associated with a model. You can automatically include or exclude certain artifacts by using the optional name-value arguments.

You can use this query in your process model to find artifacts for your tasks to iterate over or use as inputs.

The `padv.builtin.query.FindMAJustificationFileForModel` class is a `handle` class.

Creation

Description

`query = padv.builtin.query.FindMAJustificationFileForModel(JustificationFolder = relativePathToFolder)` creates a query for finding the Model Advisor justification file for a model. The query searches for the justification file within the specified folder `relativePathToFolder`. The query expects that the current iteration artifact is a model and that the Model Advisor justification file name is the model name followed by `_justifications.json`. The query returns the justification file as a `padv.Artifact` object of type `ma_justification_file`.

`query = padv.builtin.query.FindMAJustificationFileForModel( ___ ,Name=Value)` sets certain properties using one or more name-value arguments. For example, `padv.builtin.query.FindMAJustificationFileForModel(Name = "FindMyJustification")` creates a query object with the name `"FindMyJustification"`.

The `padv.builtin.query.FindMAJustificationFileForModel` class also has other properties, but you cannot set those properties during query creation.

Input Arguments

`relativePathToFolder` — Relative path to folder that contains Model Advisor justification files

string | character vector

Relative path to folder that contains Model Advisor justification files (`.json`) for the models in the project, specified as a string or a character vector.

Example: `fullfile("Justifications","ModelAdvisor")`

Data Types: `char` | `string`

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `query = padv.builtin.query.FindMAJustificationFileForModel(Name = "FindMyJustifications")`

`Name` — Unique identifier for query
string

Unique identifier for query, specified as a string.

Example: `"FindMyJustification"`

Data Types: `string`

`Parent` — Initial query run before iteration query
`"padv.builtin.query.FindModels"` (default) | `padv.Query` object | Name of `padv.Query` object

Initial query run before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify a `padv.Query` object as the iteration query for a task, the `Parent` query is the initial query that the build system runs before running the specified iteration query.

The build system ignores the `Parent` query when you specify a query as an input query or dependency query for a task.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see “Best Practices for Process Model Authoring”.

Example: `padv.builtin.query.FindModels`

Example: `padv.builtin.query.FindModels(IncludePath = "Control")`

Properties

`JustificationFolder` — Relative path to folder that contains Model Advisor justification files
string | character vector

Relative path to folder that contains Model Advisor justification files (`.json`) for the models in the project, specified as a string or a character vector.

Example: `fullfile("Justifications","ModelAdvisor")`

Data Types: `char` | `string`

`Title` — Query title
`"Model Advisor justification file for a model"` (default) | string | character vector

Query title, specified as a string or a character vector.

Example: `"Find my Model Advisor justification file"`

Data Types: `string`

DefaultArtifactType — Default artifact type returned by query
"padv_output_file" (default) | ...

Default artifact type returned by the query, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
"harness_info_file"	Harness info file
"m_class"	MATLAB class
"m_file"	MATLAB file
"m_func"	MATLAB function
"m_method"	MATLAB class method
"m_property"	MATLAB class property
"ma_config_file"	Model Advisor configuration file
"ma_justification_file"	Model Advisor justification file
"other_file"	Other file
"padv_output_file"	Process Advisor output file
"sf_chart"	Stateflow chart
"sf_graphical_fcn"	Stateflow graphical function
"sf_group"	Stateflow group
"sf_state"	Stateflow state
"sf_state_transition_chart"	Stateflow state transition chart
"sf_truth_table"	Stateflow truth table
"sl_block_diagram"	Block diagram
"sl_data_dictionary_file"	Data dictionary file
"sl_embedded_matlab_fcn"	MATLAB function
"sl_harness_block_diagram"	Harness block diagram
"sl_harness_file"	Test harness file
"sl_library_file"	Library file
"sl_model_file"	Simulink model file
"sl_protected_model_file"	Protected Simulink model file
"sl_req_table"	Requirements Table
"sl_subsystem"	Subsystem
"sl_subsystem_file"	Subsystem file
"sl_test_case"	Simulink Test case
"sl_test_case_result"	Simulink Test case result
"sl_test_file"	Simulink Test file
"sl_test_iteration"	Simulink Test iteration
"sl_test_iteration_result"	Simulink Test iteration result

Artifact Type	Description
"sl_test_report_file"	Simulink Test result report
"sl_test_result_file"	Simulink Test result file
"sl_test_resultset"	Simulink Test result set
"sl_test_seq"	Test Sequence
"sl_test_suite"	Simulink Test suite
"sl_test_suite_result"	Simulink Test suite result
"zc_block_diagram"	System Composer architecture
"zc_component"	System Composer architecture component
"zc_file"	System Composer architecture file

`Parent` — Initial query run before iteration query
`"padv.builtin.query.FindModels"` (default) | `padv.Query` object | `Name` of `padv.Query` object

Initial query run before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify a `padv.Query` object as the iteration query for a task, the `Parent` query is the initial query that the build system runs before running the specified iteration query.

The build system ignores the `Parent` query when you specify a query as an input query or dependency query for a task.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see “Best Practices for Process Model Authoring”.

Example: `padv.builtin.query.FindModels`

Example: `padv.builtin.query.FindModels(IncludePath = "Control")`

`Name` — Unique identifier for query
string

Unique identifier for query, specified as a string.

Example: `"FindMyJustification"`

Data Types: `string`

`ShowFileExtension` — Show file extensions for returned artifacts
`0` (`false`) | `1` (`true`)

Show file extensions in the `Alias` property of returned artifacts, specified as a numeric or logical `1` (`true`) or `0` (`false`). The `Alias` property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the `Alias` property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property `ShowFileExtension` as `true`.

Example: `true`

Data Types: `logical`

`SortArtifacts` — Setting for automatically sorting artifacts by address
`true` or `1` (default) | `false` or `0`

Setting for automatically sorting artifacts by address, specified as a numeric or logical `1` (`true`) or `0` (`false`). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal `sortArtifacts` method in a subclass that defines a custom sort behavior. For an example, see “Sort Artifacts in Specific Order”.

The build system automatically calls the `sortArtifacts` method when using the process model. The `sortArtifacts` method expects two input arguments: a `padv.Query` object and a list of `padv.Artifact` objects returned by the `run` method. The `sortArtifacts` method should return a list of sorted `padv.Artifact` objects.

Example: `SortArtifacts = false`

Data Types: `logical`

`FunctionHandle` — Handle to function that function-based query runs
`function_handle`

Handle to the function that a function-based query runs, specified as a `function_handle`.

If you define your query functionality inside a function and you or the build system call `run` on the query, the query runs the function specified by the `function_handle`.

The built-in queries are defined inside classes and do not use the `FunctionHandle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

run	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts` that are associated with the artifact `iterationArtifact`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	`function artifacts = run(obj,iterationArtifact)`
	`    ...`
	`end`

Examples

Use Justifications When Checking Modeling Standards

You can use the `FindMAJustificationFileForModel` query in your process model to find Model Advisor justification files for your tasks to iterate over (`IterationQuery`) or use as inputs (`addInputQueries`). For example, you can use the `FindMAJustificationFileForModel` query to find the Model Advisor justification files associated with each model and provide those files as the input to the built-in task `padv.builtin.task.RunModelStandards`.

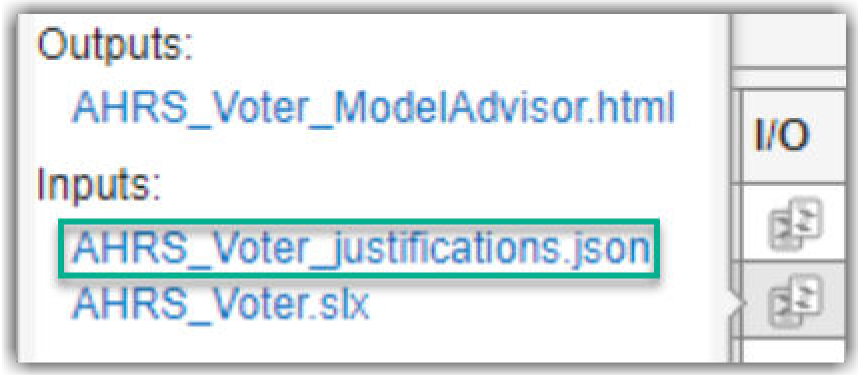
Open a project. For this example, you can open the Process Advisor example project.

```
processAdvisorExampleStart
```

If you want the built-in task `padv.builtin.task.RunModelStandards` to use your Model Advisor justification files when checking modeling standards, you can reconfigure the task to add the justification files as inputs. Add the built-in query `padv.builtin.query.FindMAJustificationFileForModel` as an input query for the task and specify the folder, `JustificationFolder`, that contains the justification files. For example, if your justification files are in the directory `Justifications/ModelAdvisor` relative to your project root, use the function `addInputQueries` to add those justification files as inputs to the task:

```
    %% Check modeling standards
    % Tools required: Model Advisor
    if includeModelStandardsTask
        maTask = pm.addTask(padv.builtin.task.RunModelStandards());

        % Find and use justification files
        maTask.addInputQueries(...
            padv.builtin.query.FindMAJustificationFileForModel(...
            JustificationFolder=fullfile("Justifications","ModelAdvisor")));
    end
```

In Process Advisor, view the updated **Tasks** by clicking **Refresh Tasks** and switching to the **Project** view. When you run the **Check Modeling Standards** task, the justification file appears as an input in the **I/O** column in Process Advisor.



Outputs:
AHRS_Voter_ModelAdvisor.html
Inputs:
AHRS_Voter_justifications.json
AHRS_Voter.slx

Capabilities and Limitations

This table identifies functionality that is supported by the query.

Functionality	Supported?
Input query for task	Yes.
Iteration query for task	Yes.

Version History

Introduced in R2023a

See Also

`padv.builtin.task.RunModelStandards`

Topics

"Justify Model Advisor Violations from Check Analysis"

padv.builtin.query.FindModels Class

Namespace: `padv.builtin.query padv.builtin.query`
Superclasses: `padv.Query`, `padv.builtin.query.FindArtifacts`

Query for finding models

Description

The `padv.builtin.query.FindModels` class provides a query that can return models in your project folder. By default, the query finds the Simulink and System Composer models in your project folder. You can automatically include or exclude certain files by using the optional name-value arguments.

You can use this query in your process model to find models for your tasks to iterate over or use as inputs.

The `padv.builtin.query.FindModels` class is a `handle` class.

Creation

Description

`query = padv.builtin.query.FindModels()` creates a query for finding each of the models in your project folder.

`query = padv.builtin.query.FindModels(Name=Value)` sets certain properties using one or more name-value arguments. For example, `padv.builtin.query.FindModels(IncludePathRegex = "modelPrefix.*\.slx")` creates a query that can find SLX files where the path contains `modelPrefix`.

The `padv.builtin.query.FindModels` class also has other properties, but you cannot set those properties during query creation.

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `query = padv.builtin.query.FindModels(IncludePathRegex = "modelPrefix.*\.slx")`

`Name` — Unique identifier for query
string | character vector

Unique identifier for query, specified as a string or a character vector.

Example: `"FindMyModels"`

Data Types: `char` | `string`

`IncludeLabel` — Find models with specific project label
cell array

Find models with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`ExcludeLabel` — Exclude models with specific project label
cell array

Exclude models with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePath` — Find models where path contains specific text
string | character vector

Find models where the path contains specific text, specified as a string. Consider using `IncludePathRegex` instead.

Example: `"Control"`

Data Types: `char` | `string`

`ExcludePath` — Exclude models where path contains specific text
string | character vector

Exclude models where the path contains specific text, specified as a string or a character vector. Consider using `ExcludePathRegex` instead.

Example: `"Control"`

Data Types: `string`

`IncludePathRegex` — Find models where path matches regular expression pattern
string | character vector

Find models where the path matches a regular expression pattern, specified as a character vector or string. `IncludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `IncludePath` instead. You can specify either `IncludePath` or `IncludePathRegex` but not both.

Example: `"modelPrefix.*\.slx"`

Data Types: `char` | `string`

`ExcludePathRegex` — Exclude models where path matches regular expression pattern
string | character vector

Exclude models where the path matches a regular expression pattern, specified as a string or a character vector. `ExcludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `ExcludePath` instead. You can specify either `ExcludePath` or `ExcludePathRegex` but not both.

Example: `"modelPrefix.*\.slx"`

Data Types: `char` | `string`

`InProject` — Include only models added to project
`0` (`false`) (default) | `1` (`true`)

Include only models that have been added to the project, specified as a numeric or logical `1` (`true`) or `0` (`false`).

Note If you specify `InProject` as `true`, you cannot use the query as an input query.

Example: `true`

Data Types: `logical`

Properties

`ArtifactType` — Type of artifact
`["sl_model_file" "zc_file"]` (default) | `"sl_model_file"` | `"zc_file"` | ...

Type of artifact, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram

Artifact Type	Description
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

Example: `"sl_model_file"`

Example: `["sl_model_file" "zc_file"]`

`IncludeLabel` — Find models with specific project label
cell array

Find models with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`ExcludeLabel` — Exclude models with specific project label
cell array

Exclude models with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePathRegex` — Find models where path matches regular expression pattern
string | character vector

Find models where the path matches a regular expression pattern, specified as a string or character vector. `IncludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `IncludePath` instead. You can specify either `IncludePath` or `IncludePathRegex` but not both.

Example: `"modelPrefix.*\.slx"`

Data Types: `char` | `string`

`ExcludePathRegex` — Exclude models where path matches regular expression pattern
string | character vector

Exclude models where the path matches a regular expression pattern, specified as a string or a character vector. `ExcludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `ExcludePath` instead. You can specify either `ExcludePath` or `ExcludePathRegex` but not both.

Example: `"modelPrefix.*\.slx"`

Data Types: `char` | `string`

`FilterSubFileArtifacts` — Filter out sub-file artifacts from query results
`1` (`true`) (default) | `0` (`false`)

Filter out sub-file artifacts from query results, specified as a numeric or logical `1` (`true`) or `0` (`false`).

A sub-file is a part of a larger file. For example, a subsystem is a sub-file of a model file. If you want a query to return both models and subsystems, you can specify `FilterSubFileArtifacts` as `false` and `ArtifactType` as `["sl_model_file" "sl_subsystem"]`.

Example: `false`

Data Types: `logical`

`InProject` — Include only models added to project
`0` (`false`) (default) | `1` (`true`)

Include only models that have been added to the project, specified as a numeric or logical `1` (`true`) or `0` (`false`).

For more information about how to add or remove files from a project, see “Add Files to the Project”

Note If you specify `InProject` as `true`, you cannot use the query as an input query.

Example: `true`

Attributes:

`Dependent`

Data Types: `logical`

`Title` — Query title
`"All models in the project"` (default) | string | character vector

Query title, specified as a string or a character vector.

Example: `"Find my models"`

Data Types: `string`

`DefaultArtifactType` — Default artifact type returned by query
`"sl_model_file"` (default) | `"zc_file"` | ...

Default artifact type returned by the query, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file

Artifact Type	Description
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

Example: `"sl_model_file"`

Example: `["sl_model_file" "zc_file"]`

`Parent` — Initial query that runs before iteration query
`padv.Query` | Name of `padv.Query` object

Initial query that runs before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify an iteration query for a task, the parent query is the initial query that the build system runs before running the specified iteration query.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see "Best Practices for Process Model Authoring" in the User's Guide PDF.

Example: `sharedQuery`

Example: `"FindMyInitialArtifacts"`

`Name` — Unique identifier for query
string | character vector

Unique identifier for query, specified as a string or a character vector.

Example: `"FindMyModels"`

Data Types: `char` | `string`

`ShowFileExtension` — Show file extensions for returned models
`0` (`false`) | `1` (`true`)

Show file extensions in the `Alias` property of returned models, specified as a numeric or logical `1` (`true`) or `0` (`false`). The `Alias` property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the `Alias` property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property `ShowFileExtension` as `true`.

Example: `true`

Data Types: `logical`

`SortArtifacts` — Setting for automatically sorting artifacts by address
`true` or `1` (default) | `false` or `0`

Setting for automatically sorting artifacts by address, specified as a numeric or logical `1` (`true`) or `0` (`false`). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal `sortArtifacts` method in a subclass that defines a custom sort behavior. For an example, see "Sort Artifacts in Specific Order" in the User's Guide PDF.

The build system automatically calls the `sortArtifacts` method when using the process model. The `sortArtifacts` method expects two input arguments: a `padv.Query` object and a list of `padv.Artifact` objects returned by the `run` method. The `sortArtifacts` method should return a list of sorted `padv.Artifact` objects.

Example: `SortArtifacts = false`

Data Types: `logical`

`FunctionHandle` — Handle to function that function-based query runs
`function_handle`

Handle to the function that a function-based query runs, specified as a `function_handle`.

If you define your query functionality inside a function and you or the build system call `run` on the query, the query runs the function specified by the `function_handle`.

The built-in queries are defined inside classes and do not use the `FunctionHandle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,~)`
	`    ...`
	`end`

Examples

Find Models for Task in Process

You can use the `FindModels` query in your task definition to find models that your tasks can iterate over (`IterationQuery`) or use as inputs (`InputQueries`). For example, suppose that you only want to run the **Check Modeling Standards** task for SLX model files where the model name contains `Control`.

Open a project. For this example, open the Process Advisor example project.

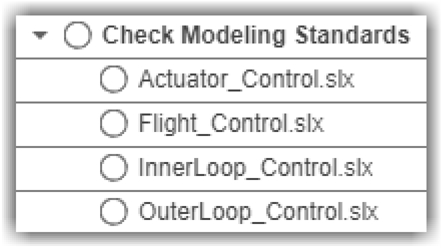
```
processAdvisorExampleStart
```

By default, the **Check Modeling Standards** task iterates over each model in the project because the task uses the built-in query `padv.builtin.query.FindModels` as the `IterationQuery`.

In the process model, reconfigure which models the **Check Modeling Standards** task iterates over by updating the `IterationQuery` for the task. The associated built-in task is `padv.builtin.task.RunModelStandards`. You can update the code to find the models in the project by using the built-in query `padv.builtin.query.FindModels`, but use the `IncludePathRegex` argument to have the query only return SLX files where the model name contains `Control`.

```
    if includeModelStandardsTask
        maTask = pm.addTask(padv.builtin.task.RunModelStandards());
        ...
        % Specify which set of artifacts to run for
        maTask.IterationQuery = ...
            padv.builtin.query.FindModels(IncludePathRegex = "Control.*\.slx");
    end
```

For this example, when you save the process model and refresh Process Advisor, the model `AHRS_Voter.slx` does not appear under the task title in Process Advisor because `AHRS_Voter.slx` does not include `Control` in the path.


Check Modeling Standards
Actuator_Control.slx
Flight_Control.slx
InnerLoop_Control.slx
OuterLoop_Control.slx

Test `FindModels` Query Outside Process Model

Although you typically use a query inside your process model, you can run an instance of the `FindModels` query outside of your process model to confirm which artifacts the query returns.

Open a project. For this example, you can open the Process Advisor example project.

```
processAdvisorExampleStart
```

Create an instance of the query. You can use the arguments of the query to filter the query results. For example, you can use the `IncludeLabel` argument to have the query only return artifacts that use the `Design` project label from the `Classification` project label category.

```
q = padv.builtin.query.FindModels(...
IncludeLabel = {"Classification","Design"});
```

Run the query and inspect the array of artifacts that the query returns.

```
run(q)
```

```
ans = 

  1×5 Artifact array with properties:

    Type
    Parent
    ArtifactAddress
```

Capabilities and Limitations

This table identifies functionality that is supported by the query.

Functionality	Supported?
Input query for task	Only when the query property `InProject` is `false`.
Iteration query for task	Yes.

See Also
`padv.builtin.query.FindArtifacts` | `padv.builtin.query.FindModelsWithLabel` | `padv.builtin.query.FindModelsWithTestCases`

padv.builtin.query.FindModelsWithLabel Class

Namespace: `padv.builtin.query padv.builtin.query`
Superclasses: `padv.Query`, `padv.builtin.query.FindArtifacts`

Query for finding models with project label

Description

The `padv.builtin.query.FindModelsWithLabel` class provides a query that can return each of the models that use the specified project label. You can automatically include or exclude certain files by using the optional name-value arguments. If you do not need to specify a project label, you can use the built-in query `padv.builtin.query.FindModels` instead.

You can use this query in your process model to find models for your tasks to iterate over.

The `padv.builtin.query.FindModelsWithLabel` class is a `handle` class.

Creation

Description

`query = padv.builtin.query.FindModelsWithLabel(categoryName,labelName)` creates a query for finding models that use the project label `labelName` from the project label category `categoryName`. For more information about project labels, see "Add Labels to Project Files".

`query = padv.builtin.query.FindModelsWithLabel(___,Name=Value)` sets certain properties using one or more name-value arguments. For example, `padv.builtin.query.FindModels(IncludePathRegex = "modelPrefix.*\.slx")` creates a query that can find SLX files where the path contains `modelPrefix`.

The `padv.builtin.query.FindModelsWithLabel` class also has other properties, but you cannot set those properties during query creation.

Input Arguments

`categoryName` — Name of category for project label
string | character vector

Name of the category for the project label, specified as a string or a character vector.

The query uses `categoryName` to specify the first entry for the query property `IncludeLabel`. For more information about project labels, see "Add Labels to Project Files".

Example: `"Classification"`

Data Types: `char` | `string`

`labelName` — Name of project label
string | character vector

Name of project label, specified as a string or a character vector.

The query uses `labelName` to specify the second entry for the query property `IncludeLabel`. For more information about project labels, see “Add Labels to Project Files”.

Example: `"Design"`

Data Types: `char` | `string`

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `query = padv.builtin.query.FindModelsWithLabel("Classification","Design",IncludePathRegex = "modelPrefix.*\.slx")`

`ExcludeLabel` — Exclude models with specific project label
cell array

Exclude models with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

For more information about project labels, see “Add Labels to Project Files”.

Example: `{"Classification","Design"}`

Data Types: `cell`

`ExcludePath` — Exclude models where path contains specific text
string | character vector

Exclude models where the path contains specific text, specified as a string or a character vector. Consider using `ExcludePathRegex` instead.

Example: `"Control"`

Data Types: `string`

`ExcludePathRegex` — Exclude models where path matches regular expression pattern
string | character vector

Exclude models where the path matches a regular expression pattern, specified as a string or a character vector. `ExcludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `ExcludePath` instead. You can specify either `ExcludePath` or `ExcludePathRegex` but not both.

Example: `"modelPrefix.*\.slx"`

Data Types: `char` | `string`

`IncludeLabel` — Find models with specific project label
cell array

Find models with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Alternatively, you can specify the first and second entries using the arguments `categoryName` and `labelName`. The query uses those arguments to specify the entries for `IncludeLabel`. For more information about project labels, see “Add Labels to Project Files”.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePath` — Find models where path contains specific text
string | character vector

Find models where the path contains specific text, specified as a string. Consider using `IncludePathRegex` instead.

Example: `"Control"`

Data Types: `char` | `string`

`IncludePathRegex` — Find models where path matches regular expression pattern
string | character vector

Find models where the path matches a regular expression pattern, specified as a character vector or string. `IncludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `IncludePath` instead. You can specify either `IncludePath` or `IncludePathRegex` but not both.

Example: `"modelPrefix.*\.slx"`

Data Types: `char` | `string`

`Name` — Unique identifier for query
string | character vector

Unique identifier for query, specified as a string or a character vector.

Example: `"FindMyLabeledModels"`

Data Types: `char` | `string`

Properties

`ArtifactType` — Type of artifact
`"sl_model_file"` | `"zc_file"` | ...

Type of artifact, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method

Artifact Type	Description
"m_property"	MATLAB class property
"ma_config_file"	Model Advisor configuration file
"ma_justification_file"	Model Advisor justification file
"other_file"	Other file
"padv_output_file"	Process Advisor output file
"sf_chart"	Stateflow chart
"sf_graphical_fcn"	Stateflow graphical function
"sf_group"	Stateflow group
"sf_state"	Stateflow state
"sf_state_transition_chart"	Stateflow state transition chart
"sf_truth_table"	Stateflow truth table
"sl_block_diagram"	Block diagram
"sl_data_dictionary_file"	Data dictionary file
"sl_embedded_matlab_fcn"	MATLAB function
"sl_harness_block_diagram"	Harness block diagram
"sl_harness_file"	Test harness file
"sl_library_file"	Library file
"sl_model_file"	Simulink model file
"sl_protected_model_file"	Protected Simulink model file
"sl_req_table"	Requirements Table
"sl_subsystem"	Subsystem
"sl_subsystem_file"	Subsystem file
"sl_test_case"	Simulink Test case
"sl_test_case_result"	Simulink Test case result
"sl_test_file"	Simulink Test file
"sl_test_iteration"	Simulink Test iteration
"sl_test_iteration_result"	Simulink Test iteration result
"sl_test_report_file"	Simulink Test result report
"sl_test_result_file"	Simulink Test result file
"sl_test_resultset"	Simulink Test result set
"sl_test_seq"	Test Sequence
"sl_test_suite"	Simulink Test suite
"sl_test_suite_result"	Simulink Test suite result
"zc_block_diagram"	System Composer architecture
"zc_component"	System Composer architecture component
"zc_file"	System Composer architecture file

Example: `"sl_model_file"`

Example: `["sl_model_file" "zc_file"]`

`IncludeLabel` — Find models with specific project label
cell array

Find models with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Alternatively, you can specify the first and second entries using the arguments `categoryName` and `labelName`. The query uses those arguments to specify the entries for `IncludeLabel`. For more information about project labels, see “Add Labels to Project Files”.

Example: `{"Classification","Design"}`

Data Types: `cell`

`ExcludeLabel` — Exclude models with specific project label
cell array

Exclude models with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

For more information about project labels, see “Add Labels to Project Files”.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePathRegex` — Find models where path matches regular expression pattern
string | character vector

Find models where the path matches a regular expression pattern, specified as a string or character vector. `IncludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `IncludePath` instead. You can specify either `IncludePath` or `IncludePathRegex` but not both.

Example: `"modelPrefix.*\.slx"`

Data Types: `char` | `string`

`ExcludePathRegex` — Exclude models where path matches regular expression pattern
string | character vector

Exclude models where the path matches a regular expression pattern, specified as a string or a character vector. `ExcludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `ExcludePath` instead. You can specify either `ExcludePath` or `ExcludePathRegex` but not both.

Example: `"modelPrefix.*\.slx"`

Data Types: `char` | `string`

`FilterSubFileArtifacts` — Filter out sub-file artifacts from query results
`1` (`true`) (default) | `0` (`false`)

Filter out sub-file artifacts from query results, specified as a numeric or logical `1` (`true`) or `0` (`false`).

A sub-file is a part of a larger file. For example, a subsystem is a sub-file of a model file.

Example: `false`

Data Types: `logical`

`InProject` — Include only models added to project
`0` (`false`) (default) | `1` (`true`)

Include only models that have been added to the project, specified as a numeric or logical `1` (`true`) or `0` (`false`).

For more information about how to add or remove files from a project, see “Add Files to the Project”

Example: `true`

Attributes:

`Dependent`

Data Types: `logical`

`Title` — Query title
`"All models with label ''"` (default) | string | character vector

Query title, specified as a string or a character vector.

When you specify a project label name, the query automatically updates the `Title` to include that project label name. For example, `"All models with label 'Design'"`.

Example: `"Find my labeled models"`

Data Types: `string`

`DefaultArtifactType` — Default artifact type returned by query
`"padv_output_file"` (default) | `"sl_model_file"` | `"zc_file"` | ...

Default artifact type returned by the query, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file

Artifact Type	Description
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

Example: `"sl_model_file"`

Example: `["sl_model_file" "zc_file"]`

`Parent` — Initial query that runs before iteration query
`padv.Query` | Name of `padv.Query` object

Initial query that runs before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify an iteration query for a task, the parent query is the initial query that the build system runs before running the specified iteration query.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see "Best Practices for Process Model Authoring" in the User's Guide PDF.

Example: `sharedQuery`

Example: `"FindMyInitialArtifacts"`

`ShowFileExtension` — Show file extensions for returned models
`0` (false) | `1` (true)

Show file extensions in the `Alias` property of returned models, specified as a numeric or logical `1` (`true`) or `0` (`false`). The `Alias` property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the `Alias` property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property `ShowFileExtension` as `true`.

Example: `true`

Data Types: `logical`

`SortArtifacts` — Setting for automatically sorting artifacts by address
`true` or `1` (default) | `false` or `0`

Setting for automatically sorting artifacts by address, specified as a numeric or logical `1` (`true`) or `0` (`false`). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal `sortArtifacts` method in a subclass that defines a custom sort behavior. For an example, see "Sort Artifacts in Specific Order" in the User's Guide PDF.

The build system automatically calls the `sortArtifacts` method when using the process model. The `sortArtifacts` method expects two input arguments: a `padv.Query` object and a list of `padv.Artifact` objects returned by the `run` method. The `sortArtifacts` method should return a list of sorted `padv.Artifact` objects.

Example: `SortArtifacts = false`

Data Types: `logical`

`FunctionHandle` — Handle to function that function-based query runs
`function_handle`

Handle to the function that a function-based query runs, specified as a `function_handle`.

If you define your query functionality inside a function and you or the build system call `run` on the query, the query runs the function specified by the `function_handle`.

The built-in queries are defined inside classes and do not use the `FunctionHandle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,~)`
	`    ...`
	`end`

Examples

Find Models with Specific Project Label

You can use the `FindModelsWithLabel` query in your task definition to find models that your tasks can iterate over (`IterationQuery`). For example, suppose that you want the built-in task `padv.builtin.task.RunModelStandards` to only run for models that use the project label `RunModelAdvisor` from the project label category `ModelLabels`.

Open a project. For this example, open the Process Advisor example project.

```
processAdvisorExampleStart
```

By default, the **Check Modeling Standards** task iterates over each model in the project because the task uses the built-in query `padv.builtin.query.FindModels` as the `IterationQuery`.

In the process model, reconfigure which models the **Check Modeling Standards** task iterates over by updating the `IterationQuery` for the task. The associated built-in task is `padv.builtin.task.RunModelStandards`. You can update the code to find only models in the project that use the project label `RunModelAdvisor` from the project label category `ModelLabels`. You can use the built-in query `padv.builtin.query.FindModelsWithLabel` to find the models that use that project label. Specify the first input argument as the project label category and the second argument as the project label name.

```
maTask = pm.addTask(padv.builtin.task.RunModelStandards());
maTask.IterationQuery = ...
    padv.builtin.query.FindModelsWithLabel("ModelLabels","RunModelAdvisor");
```

Capabilities and Limitations

This table identifies functionality that is supported by the query.

Functionality	Supported?
Input query for task	No.
Iteration query for task	Yes.

See Also

`padv.builtin.query.FindArtifacts` | `padv.builtin.query.FindModels` | `padv.builtin.query.FindModelsWithTestCases`

Topics

"Add Labels to Project Files"

padv.builtin.query.FindModelsWithTestCases Class

Namespace: `padv.builtin.query padv.builtin.query`
Superclasses: `padv.Query`

Query for finding models that have test cases

Description

The `padv.builtin.query.FindModelsWithTestCases` class provides a query that can return the models in your project that have test cases.

You can use this query in your process model to find models that are associated with test cases. For example, If you use a built-in task like `padv.builtin.task.MergeTestResults` to merge the test results for each model in your project, you can use the `FindModelsWithTestCases` query to find only models that have test cases and therefore test results that the task can merge.

The `padv.builtin.query.FindModelsWithTestCases` class is a `handle` class.

Creation

Description

`query = padv.builtin.query.FindModelsWithTestCases()` creates a query for finding the models in your project that have test cases.

`query = padv.builtin.query.FindModelsWithTestCases(Name=Value)` sets certain properties using one or more name-value arguments. For example, `query = padv.builtin.query.FindModelsWithTestCases(ExcludePath = "Control")` creates a query that finds models that have test cases, but excludes models that have `"Control"` in the file address.

The `padv.builtin.query.FindModelsWithTestCases` class also has other properties, but you cannot set those properties during query creation.

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `query = padv.builtin.query.FindModelsWithTestCases(ExcludePath = "Control")`

`ExcludeLabel` — Exclude models with specific project label
cell array

Exclude models with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`ExcludePath` — Exclude models where path contains specific text
string | character vector

Exclude models where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `char` | `string`

`IncludeLabel` — Find models with specific project label
cell array

Find models with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePath` — Find models where path contains specific text
string | character vector

Find models where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `char` | `string`

`Name` — Unique identifier for query
string | character vector

Unique identifier for query, specified as a string or a character vector.

Example: `"FindModelsWithTests"`

Data Types: `char` | `string`

`Parent` — Initial query that runs before iteration query
`"padv.builtin.query.FindModels"` (default) | `padv.Query` | `Name` of `padv.Query` object

Initial query that runs before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify an iteration query for a task, the parent query is the initial query that the build system runs before running the specified iteration query.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see "Best Practices for Process Model Authoring" in the User's Guide PDF.

Example: `sharedFindModelsQuery`

Example: `"padv.builtin.query.FindModels"`

`Tags` — Find models with at least one test case that uses specific test case tags
string | array of strings

Find models that have at least one test case that uses specific test case tags, specified as a string or an array of strings.

Example: `"FeatureA"`

Example: `["FeatureA","FeatureB"]`

Data Types: `string`

Properties

`IncludeLabel` — Find models with specific project label
cell array

Find models with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`ExcludeLabel` — Exclude models with specific project label
cell array

Exclude models with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePath` — Find models where path contains specific text
string | character vector

Find models where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `char` | `string`

`ExcludePath` — Exclude models where path contains specific text
string | character vector

Exclude models where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `char` | `string`

`Tags` — Only include models with test cases that use specific test case tags
string | array of strings

Only include models with test cases that use specific test case tags, specified as a string or an array of strings.

Example: `"FeatureA"`

Example: `["FeatureA","FeatureB"]`

Data Types: `string`

`Title` — Query title
`"All models with associated test cases"` (default) | string | character vector

Query title, specified as a string or a character vector.

Example: "Find models that have test cases"

Data Types: char | string

DefaultArtifactType — Default artifact type returned by query
["sl_model_file" "zc_file"] (default) | "sl_model_file" | "zc_file" | ...

Default artifact type returned by the query, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
"harness_info_file"	Harness info file
"m_class"	MATLAB class
"m_file"	MATLAB file
"m_func"	MATLAB function
"m_method"	MATLAB class method
"m_property"	MATLAB class property
"ma_config_file"	Model Advisor configuration file
"ma_justification_file"	Model Advisor justification file
"other_file"	Other file
"padv_output_file"	Process Advisor output file
"sf_chart"	Stateflow chart
"sf_graphical_fcn"	Stateflow graphical function
"sf_group"	Stateflow group
"sf_state"	Stateflow state
"sf_state_transition_chart"	Stateflow state transition chart
"sf_truth_table"	Stateflow truth table
"sl_block_diagram"	Block diagram
"sl_data_dictionary_file"	Data dictionary file
"sl_embedded_matlab_fcn"	MATLAB function
"sl_harness_block_diagram"	Harness block diagram
"sl_harness_file"	Test harness file
"sl_library_file"	Library file
"sl_model_file"	Simulink model file
"sl_protected_model_file"	Protected Simulink model file
"sl_req_table"	Requirements Table
"sl_subsystem"	Subsystem
"sl_subsystem_file"	Subsystem file
"sl_test_case"	Simulink Test case
"sl_test_case_result"	Simulink Test case result

Artifact Type	Description
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

Example: `"zc_file"`

`Parent` — Initial query that runs before iteration query
`"padv.builtin.query.FindModels"` (default) | `padv.Query` | Name of `padv.Query` object

Initial query that runs before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify an iteration query for a task, the parent query is the initial query that the build system runs before running the specified iteration query.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see "Best Practices for Process Model Authoring" in the User's Guide PDF.

Example: `sharedFindModelsQuery`

Example: `"padv.builtin.query.FindModels"`

`Name` — Unique identifier for query
string | character vector

Unique identifier for query, specified as a string or a character vector.

Example: `"FindModelsWithTests"`

Data Types: `char` | `string`

`ShowFileExtension` — Show file extensions for returned artifacts
`0` (`false`) | `1` (`true`)

Show file extensions in the `Alias` property of returned artifacts, specified as a numeric or logical `1` (`true`) or `0` (`false`). The `Alias` property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the `Alias` property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property `ShowFileExtension` as `true`.

Example: `true`

Data Types: `logical`

`SortArtifacts` — Setting for automatically sorting artifacts by address
`true` or `1` (default) | `false` or `0`

Setting for automatically sorting artifacts by address, specified as a numeric or logical `1` (`true`) or `0` (`false`). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal `sortArtifacts` method in a subclass that defines a custom sort behavior. For an example, see "Sort Artifacts in Specific Order" in the User's Guide PDF.

The build system automatically calls the `sortArtifacts` method when using the process model. The `sortArtifacts` method expects two input arguments: a `padv.Query` object and a list of `padv.Artifact` objects returned by the `run` method. The `sortArtifacts` method should return a list of sorted `padv.Artifact` objects.

Example: `SortArtifacts = false`

Data Types: `logical`

`FunctionHandle` — Handle to function that function-based query runs
`function_handle`

Handle to the function that a function-based query runs, specified as a `function_handle`.

If you define your query functionality inside a function and you or the build system call `run` on the query, the query runs the function specified by the `function_handle`.

The built-in queries are defined inside classes and do not use the `FunctionHandle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts` that are associated with the artifact `iterationArtifact`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,iterationArtifact)`
	`    ...`
	`end`

Examples

Find Models with Test Cases for Task in Process

You can use the `FindModelsWithTestCases` query in your process model to find units and components that your tasks can iterate over (`IterationQuery`). Suppose you have a custom task that you want to run for each model in your project that has test cases. You can find those models by using the built-in query `FindModelsWithTestCases`.

Open a project. For this example, open the Process Advisor example project.

```
processAdvisorExampleStart
```

To have the custom task run for each of those models, specify the query as the iteration query for the task. For example, in your process model:

```
pm.addTask("MyCustomTask",...
    IterationQuery = padv.builtin.query.FindModelsWithTestCases);
```

In Process Advisor, view the updated **Tasks** by clicking **Refresh Tasks** and switching to the **Project** view. For the task `MyCustomTask`, there is one task iteration for each model that has test cases. The Process Advisor example project has two models that have test cases: `AHRS_Voter` and `OuterLoop_Control`.

Capabilities and Limitations

This table identifies functionality that is supported by the query.

Functionality	Supported?
Input query for task	No.
Iteration query for task	Yes. See IterationQuery.

See Also

`padv.builtin.task.MergeTestResults` | `padv.builtin.query.FindModels` | `padv.builtin.query.FindModels` | `padv.builtin.query.FindTestCasesForModel`

padv.builtin.query.FindProjectFile

This query returns the project file. The query inherits from the `padv.Query` base class.

Syntax

`q = padv.builtin.query.FindProjectFile()` finds the project file.

Methods

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,~)`
	`    ...`
	`end`

Use in Process Model

You can use this query in your process model to find artifacts that your tasks can iterate over (`IterationQuery`) or use as inputs (`InputQueries`).

For example, suppose that you have a custom task, `MyCustomTask`, that you want to run once for the project. You can use the built-in query `padv.builtin.query.FindProjectFile` to find the project file and specify the query as the `IterationQuery` for the custom task.

```
taskObj = addTask(pm, "MyCustomTask",...
    IterationQuery = padv.builtin.query.FindProjectFile);
```

padv.builtin.query.FindRefModels

This query returns each of the referenced models in the project. The query inherits from the `padv.Query` base class. You can use optional name-value arguments to filter the results.

Syntax

`q = padv.builtin.query.FindRefModels()` finds all reference models in the project.

`q = padv.builtin.query.FindRefModels(Name,Value)` find reference models that meet the criteria specified by one or more name-value arguments. For example, to find reference models that include `Control` in the full file path, specify `IncludePath="Control"`.

Input Arguments

Name-Value Arguments

- **`Name`** — Unique identifier for query, specified as character vector or string. Example: `"CustomQuery"`
- **`IncludeLabel`** — Find artifacts that have a specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name. Example: `{"Classification","Design"}`
- **`ExcludeLabel`** — Exclude artifacts that have a specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name. Example: `{"Classification","Design"}`
- **`IncludePath`** — Find artifacts where the path contains specific text, specified as a character vector or string. Example: `"Control"`
- **`ExcludePath`** — Exclude artifacts where the path contains specific text, specified as a character vector. Example: `"Control"`

Methods

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,~)`
	`    ...`
	`end`

Use in Process Model

You can use this query in your process model to find artifacts for your task to iterate over (`IterationQuery`).

For example, suppose that you want the built-in task `padv.builtin.task.RunModelStandards` to only run on reference models in the project. You can change the `IterationQuery` for the task to specify a different set of artifacts for the task to run on. You can use the built-in query `padv.builtin.query.FindRefModels` to find the reference models.

```
maTask = pm.addTask(padv.builtin.task.RunModelStandards());
maTask.IterationQuery = ...
    padv.builtin.query.FindRefModels;
```

Note You cannot use this query as an input query (`InputQueries`).

padv.builtin.query.FindRequirements Class

Namespace: `padv.builtin.query padv.builtin.query`
Superclasses: `padv.Query`, `padv.builtin.query.FindArtifacts`

Query for finding requirements

Description

The `padv.builtin.query.FindRequirements` class provides a query that can return the requirements files in your project folder. You can automatically include or exclude certain files by using the optional name-value arguments.

You can use this query in your process model to find requirements files for your tasks to iterate over or use as inputs.

The `padv.builtin.query.FindRequirements` class is a `handle` class.

Creation

Description

`query = padv.builtin.query.FindRequirements()` creates a query for finding each of the requirements files (`.slreqx`) in your project folder.

`query = padv.builtin.query.FindRequirements(Name=Value)` sets certain properties using one or more name-value arguments. For example, `padv.builtin.query.FindRequirements(IncludePathRegex = "HighLevel.*\.slreqx")` creates a query that can find SLREQX files where the path contains `HighLevel`.

The `padv.builtin.query.FindRequirements` class also has other properties, but you cannot set those properties during query creation.

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `query = padv.builtin.query.FindRequirements(IncludePathRegex = "HighLevel.*\.slreqx")`

`Name` — Unique identifier for query
string | character vector

Unique identifier for query, specified as a string or a character vector.

Example: `"FindMyRequirements"`

Data Types: `char` | `string`

`IncludeLabel` — Find requirements with specific project label
cell array

Find requirements with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Level","System"}`

Data Types: `cell`

`ExcludeLabel` — Exclude requirements with specific project label
cell array

Exclude requirements with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Level","System"}`

Data Types: `cell`

`IncludePath` — Find requirements where path contains specific text
string

Find requirements where the path contains specific text, specified as a string. Consider using `IncludePathRegex` instead.

Example: `"HighLevel"`

Data Types: `string`

`ExcludePath` — Exclude requirements where path contains specific text
string | character vector

Exclude requirements where the path contains specific text, specified as a string or a character vector. Consider using `ExcludePathRegex` instead.

Example: `"System"`

Data Types: `string`

`IncludePathRegex` — Find requirements where path matches regular expression pattern
string | character vector

Find requirements where the path matches a regular expression pattern, specified as a character vector or string. `IncludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `IncludePath` instead. You can specify either `IncludePath` or `IncludePathRegex` but not both.

Example: `"reqPrefix.*\.slx"`

Data Types: `char` | `string`

`ExcludePathRegex` — Exclude requirements where path matches regular expression pattern
string | character vector

Exclude requirements where the path matches a regular expression pattern, specified as a string or a character vector. `ExcludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `ExcludePath` instead. You can specify either `ExcludePath` or `ExcludePathRegex` but not both.

Example: `"reqPrefix.*\.slx"`

Data Types: `char` | `string`

Properties

`ArtifactType` — Type of artifact
`"mwreq_file"` (default) | ...

Type of artifact, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem

Artifact Type	Description
"sl_subsystem_file"	Subsystem file
"sl_test_case"	Simulink Test case
"sl_test_case_result"	Simulink Test case result
"sl_test_file"	Simulink Test file
"sl_test_iteration"	Simulink Test iteration
"sl_test_iteration_result"	Simulink Test iteration result
"sl_test_report_file"	Simulink Test result report
"sl_test_result_file"	Simulink Test result file
"sl_test_resultset"	Simulink Test result set
"sl_test_seq"	Test Sequence
"sl_test_suite"	Simulink Test suite
"sl_test_suite_result"	Simulink Test suite result
"zc_block_diagram"	System Composer architecture
"zc_component"	System Composer architecture component
"zc_file"	System Composer architecture file

Example: "mwreq_file"

Example: ["mwreq_file" "other_file"]

IncludeLabel — Find requirements with specific project label
cell array

Find requirements with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: {"Level","System"}

Data Types: cell

ExcludeLabel — Exclude requirements with specific project label
cell array

Exclude requirements with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: {"Level","System"}

Data Types: cell

IncludePathRegex — Find requirements where path matches regular expression pattern
string | character vector

Find requirements where the path matches a regular expression pattern, specified as a string or character vector. IncludePathRegex expects UNIX-style path separators.

If you want to use a literal path, use IncludePath instead. You can specify either IncludePath or IncludePathRegex but not both.

Example: "HighLevel.*\.slreqx"

Data Types: `char` | `string`

`ExcludePathRegex` — Exclude requirements where path matches regular expression pattern
string | character vector

Exclude requirements where the path matches a regular expression pattern, specified as a string or a character vector. `ExcludePathRegex` expects UNIX-style path separators.

If you want to use a literal path, use `ExcludePath` instead. You can specify either `ExcludePath` or `ExcludePathRegex` but not both.

Example: `"HighLevel.*\.slreqx"`

Data Types: `char` | `string`

`FilterSubFileArtifacts` — Filter out sub-file artifacts from query results
`1` (`true`) (default) | `0` (`false`)

Filter out sub-file artifacts from query results, specified as a numeric or logical `1` (`true`) or `0` (`false`).

A sub-file is a part of a larger file. For example, a subsystem is a sub-file of a model file.

Example: `false`

Data Types: `logical`

`InProject` — Include only requirements added to project
`0` (`false`) (default) | `1` (`true`)

Include only requirements files that have been added to the project, specified as a numeric or logical `1` (`true`) or `0` (`false`).

For more information about how to add or remove files from a project, see “Add Files to the Project”

Note If you specify `InProject` as `true`, you cannot use the query as an input query.

Example: `true`

Attributes:

`Dependent`

Data Types: `logical`

`Title` — Query title
`"All requirements in the project"` (default) | string | character vector

Query title, specified as a string or a character vector.

Example: `"Find my requirements"`

Data Types: `string`

`DefaultArtifactType` — Default artifact type returned by query
`"mwreq_file"` (default) | ...

Default artifact type returned by the query, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file

Artifact Type	Description
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

Example: `"mwreq_file"`

Example: `["mwreq_file" "other_file"]`

`Parent` — Initial query that runs before iteration query
`padv.Query` | `Name` of `padv.Query` object

Initial query that runs before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify an iteration query for a task, the parent query is the initial query that the build system runs before running the specified iteration query.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see "Best Practices for Process Model Authoring" in the User's Guide PDF.

Example: `sharedQuery`

Example: `"FindMyInitialArtifacts"`

`ShowFileExtension` — Show file extensions for returned requirements
`0` (`false`) | `1` (`true`)

Show file extensions in the `Alias` property of returned requirements, specified as a numeric or logical `1` (`true`) or `0` (`false`). The `Alias` property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the `Alias` property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property `ShowFileExtension` as `true`.

Example: `true`

Data Types: `logical`

`SortArtifacts` — Setting for automatically sorting requirements by address
`true` or `1` (default) | `false` or `0`

Setting for automatically sorting requirements by address, specified as a numeric or logical `1` (`true`) or `0` (`false`). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal `sortArtifacts` method in a subclass that defines a custom sort behavior. For an example, see "Sort Artifacts in Specific Order" in the User's Guide PDF.

The build system automatically calls the `sortArtifacts` method when using the process model. The `sortArtifacts` method expects two input arguments: a `padv.Query` object and a list of `padv.Artifact` objects returned by the `run` method. The `sortArtifacts` method should return a list of sorted `padv.Artifact` objects.

Example: `SortArtifacts = false`

Data Types: `logical`

`FunctionHandle` — Handle to function that function-based query runs
`function_handle`

Handle to the function that a function-based query runs, specified as a `function_handle`.

If you define your query functionality inside a function and you or the build system call `run` on the query, the query runs the function specified by the `function_handle`.

The built-in queries are defined inside classes and do not use the `FunctionHandle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,~)`
	`    ...`
	`end`

Examples

Find Requirements for Task in Process

You can use the `FindRequirements` query in your task definition to find requirements files that your tasks can iterate over (`IterationQuery`) or use as inputs (`InputQueries`). For example, suppose that you want to add a custom task, `MyCustomTask`, that runs for each requirement in the project.

Open a project. For this example, you can open the Process Advisor example project.

```
processAdvisorExampleStart
```

By default, a new task runs one time for the project.

In the process model, you can add a new custom task and have the task iterate over each requirement in the project by specifying the task `IterationQuery` as `padv.builtin.query.FindRequirements`.

```
    taskObj = addTask(pm, "MyCustomTask",...
        IterationQuery = padv.builtin.query.FindRequirements,...
        InputQueries = padv.builtin.query.GetIterationArtifact);
```

This code allows the task to use the artifacts returned by `IterationQuery` as inputs to the task by specifying `InputQueries` as `padv.builtin.query.GetIterationArtifact`.

For the Process Advisor example project, when you save the process model and refresh Process Advisor, the custom task **MyCustomTask** has task iterations for the requirement sets `HighLevelReqs` and `SystemReqs`.

Capabilities and Limitations

This table identifies functionality that is supported by the query.

Functionality	Supported?
Input query for task	Only when the query property `InProject` is `false`.
Iteration query for task	Yes.

See Also

`padv.builtin.query.FindArtifacts` | `padv.builtin.query.FindRequirementsForModel`

padv.builtin.query.FindRequirementsForModel Class

Namespace: `padv.builtin.query padv.builtin.query`
Superclasses: `padv.Query`

Query for finding requirements for model

Description

The `padv.builtin.query.FindRequirementsForModel` class provides a query that can return each of the requirements associated with a model. You can automatically include or exclude certain artifacts by using the optional name-value arguments.

You can use this query in your process model to find artifacts for your tasks to iterate over or use as inputs. To find each of the requirements in your project, you can use `padv.builtin.query.FindRequirements` instead.

The `padv.builtin.query.FindRequirementsForModel` class is a `handle` class.

Creation

Description

`query = padv.builtin.query.FindRequirementsForModel()` creates a query for finding each of the requirements associated with a model.

`query = padv.builtin.query.FindRequirementsForModel(Name=Value)` sets certain properties using one or more name-value arguments. For example, `padv.builtin.query.FindRequirementsForModel(IncludePath="System")` creates a query object to find requirements that include `System` in the full file path.

Note If you use this query as an input query and specify non-empty values for `IncludeLabel`, `ExcludeLabel`, `IncludePath`, or `ExcludePath`, your task results can unexpectedly become outdated. If you see this behavior, consider using a different query, like `padv.builtin.query.FindArtifacts`, instead. For more information and a list of queries that are not impacted by this limitation, see “Other Limitations”.

The `padv.builtin.query.FindRequirementsForModel` class also has other properties, but you cannot set those properties during query creation.

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `query = padv.builtin.query.FindRequirementsForModel(IncludePath="System")`

`ExcludeLabel` — Exclude requirements with specific project label
cell array

Exclude requirements with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Category","Label"}`

Data Types: `cell`

`ExcludePath` — Exclude artifacts where path contains specific text
string | character vector

Exclude artifacts where the path contains specific text, specified as a string or a character vector.

Example: `"HLR"`

Data Types: `string`

`IncludeLabel` — Find artifacts with specific project label
cell array

Find artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Category","Label"}`

Data Types: `cell`

`IncludePath` — Find artifacts where path contains specific text
string

Find artifacts where the path contains specific text, specified as a string.

Example: `"HLR"`

Data Types: `string`

`Name` — Unique identifier for query
string

Unique identifier for query, specified as a string.

Example: `"FindMyRequirements"`

Data Types: `string`

`Parent` — Initial query run before iteration query
`"padv.builtin.query.FindModels"` (default) | `padv.Query` object | `Name` of `padv.Query` object

Initial query run before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify a `padv.Query` object as the iteration query for a task, the `Parent` query is the initial query that the build system runs before running the specified iteration query.

The build system ignores the `Parent` query when you specify a query as an input query or dependency query for a task.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see “Best Practices for Process Model Authoring”.

Example: `padv.builtin.query.FindModels`

Example: `padv.builtin.query.FindModels(IncludePath = "Control")`

Properties

`IncludeLabel` — Find artifacts with specific project label
cell array

Find artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Category","Label"}`

Data Types: `cell`

`ExcludeLabel` — Exclude artifacts with specific project label
cell array

Exclude artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Category","Label"}`

Data Types: `cell`

`IncludePath` — Find artifacts where path contains specific text
string

Find artifacts where the path contains specific text, specified as a string.

Example: `"HLR"`

Data Types: `string`

`ExcludePath` — Exclude artifacts where path contains specific text
string | character vector

Exclude artifacts where the path contains specific text, specified as a string or a character vector.

Example: `"HLR"`

Data Types: `string`

`Title` — Query title
`"All requirements for a model"` (default) | string | character vector

Query title, specified as a string or a character vector.

Example: `"Find my requirements"`

Data Types: `string`

`DefaultArtifactType` — Default artifact type returned by query
`"sl_req"` | `"mwreq_item"` | ...

Default artifact type returned by the query, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	**Description**
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file

Artifact Type	Description
"sl_test_resultset"	Simulink Test result set
"sl_test_seq"	Test Sequence
"sl_test_suite"	Simulink Test suite
"sl_test_suite_result"	Simulink Test suite result
"zc_block_diagram"	System Composer architecture
"zc_component"	System Composer architecture component
"zc_file"	System Composer architecture file

Example: `"sl_req"`

Example: `["sl_req" "mwreq_item"]`

`Parent` — Initial query run before iteration query
`"padv.builtin.query.FindModels"` (default) | `padv.Query` object | Name of `padv.Query` object

Initial query run before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify a `padv.Query` object as the iteration query for a task, the `Parent` query is the initial query that the build system runs before running the specified iteration query.

The build system ignores the `Parent` query when you specify a query as an input query or dependency query for a task.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see “Best Practices for Process Model Authoring”.

Example: `padv.builtin.query.FindModels`

Example: `padv.builtin.query.FindModels(IncludePath = "Control")`

`Name` — Unique identifier for query
string

Unique identifier for query, specified as a string.

Example: `"FindMyRequirements"`

Data Types: `string`

`ShowFileExtension` — Show file extensions for returned artifacts
`0` (`false`) | `1` (`true`)

Show file extensions in the `Alias` property of returned artifacts, specified as a numeric or logical `1` (`true`) or `0` (`false`). The `Alias` property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the `Alias` property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property `ShowFileExtension` as `true`.

Example: `true`

Data Types: `logical`

`SortArtifacts` — Setting for automatically sorting artifacts by address
`true` or `1` (default) | `false` or `0`

Setting for automatically sorting artifacts by address, specified as a numeric or logical `1` (`true`) or `0` (`false`). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal `sortArtifacts` method in a subclass that defines a custom sort behavior. For an example, see "Sort Artifacts in Specific Order".

The build system automatically calls the `sortArtifacts` method when using the process model. The `sortArtifacts` method expects two input arguments: a `padv.Query` object and a list of `padv.Artifact` objects returned by the `run` method. The `sortArtifacts` method should return a list of sorted `padv.Artifact` objects.

Example: `SortArtifacts = false`

Data Types: `logical`

`FunctionHandle` — Handle to function that function-based query runs
`function_handle`

Handle to the function that a function-based query runs, specified as a `function_handle`.

If you define your query functionality inside a function and you or the build system call `run` on the query, the query runs the function specified by the `function_handle`.

The built-in queries are defined inside classes and do not use the `FunctionHandle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts` that are associated with the artifact `iterationArtifact`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,iterationArtifact)`
	`    ...`
	`end`

Examples

Find and Run Tasks Using Requirements

You can use the `FindRequirementsForModel` query in your process model to find requirements for your tasks to iterate over (`IterationQuery`) or use as inputs (`addInputQueries`).

Open a project. For this example, you can open the Process Advisor example project.

```
processAdvisorExampleStart
```

Edit the process model to use the following process model instead.

```
function processmodel(pm)
    % Defines the project's processmodel

    arguments
        pm padv.ProcessModel
    end

    t1 = pm.addTask("TaskInputsAreReqs",...
        Iterationquery = padv.builtin.query.FindModels(...
        IncludePath = "AHRS_Voter.slx"),...
        InputQueries = padv.builtin.query.FindRequirementsForModel());

    t2 = pm.addTask("TaskIteratesOverModelReqs",...
        IterationQuery = padv.builtin.query.FindRequirementsForModel(...
        Parent =  padv.builtin.query.FindModels(IncludePath = "AHRS_Voter.slx")));

end
```

This process model adds two custom tasks to the process. The code configures task `t1` to run on the model `InnerLoop_Control` and to use the requirements associated with that model as inputs to the task. The code configures task `t2` to run on each requirement associated with the model `InnerLoop_Control`.

In Process Advisor, view the updated **Tasks** by clicking **Refresh Tasks** and switching to the **Project** view.

Capabilities and Limitations

This table identifies functionality that is supported by the query.

Functionality	Supported?
Input query for task	Yes.
Iteration query for task	Yes.

See Also

`padv.builtin.query.FindRequirements`

padv.builtin.query.FindTestCasesForModel Class

Namespace: `padv.builtin.query padv.builtin.query`
Superclasses: `padv.Query`

Query for finding test cases for model

Description

The `padv.builtin.query.FindTestCasesForModel` class provides a query that can return the test cases associated with a model, including test cases associated with subsystem references. You can automatically include or exclude certain test cases by using the optional name-value arguments.

You can use this query in your process model to find test cases for your tasks to iterate over or use as inputs.

The `padv.builtin.query.FindTestCasesForModel` class is a `handle` class.

Creation

Description

`query = padv.builtin.query.FindTestCasesForModel()` creates a query for finding the test cases associated with a model, including test cases associated with subsystem references.

`query = padv.builtin.query.FindTestCasesForModel(Name=Value)` sets certain properties using one or more name-value arguments. For example, `padv.builtin.query.FindTestCasesForModel(Tags = "TagA")` creates a query object for finding test cases that use the test case tag `"TagA"`.

Note If you use this query as an input query and specify non-empty values for `IncludeLabel`, `ExcludeLabel`, `IncludePath`, or `ExcludePath`, your task results can unexpectedly become outdated. If you see this behavior, consider using a different query, like `padv.builtin.query.FindArtifacts`, instead. For more information and a list of queries that are not impacted by this limitation, see “Other Limitations”.

The `padv.builtin.query.FindTestCasesForModel` class also has other properties, but you cannot set those properties during query creation.

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `query = padv.builtin.query.FindTestCasesForModel(Tags = "TagA")`

`ExcludeLabel` — Exclude artifacts with specific project label
cell array

Exclude artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Category","Label"}`

Data Types: `cell`

`ExcludePath` — Exclude artifacts where path contains specific text
string | character vector

Exclude artifacts where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `string`

`IncludeLabel` — Find artifacts with specific project label
cell array

Find artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Category","Label"}`

Data Types: `cell`

`IncludePath` — Find artifacts where path contains specific text
string

Find artifacts where the path contains specific text, specified as a string.

Example: `"Control"`

Data Types: `string`

`Name` — Unique identifier for query
string

Unique identifier for query, specified as a string.

Example: `"FindMyTestCases"`

Data Types: `string`

`Parent` — Initial query run before iteration query
`"padv.builtin.query.FindModels"` (default) | `padv.Query` object | `Name` of `padv.Query` object

Initial query run before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify a `padv.Query` object as the iteration query for a task, the `Parent` query is the initial query that the build system runs before running the specified iteration query.

The build system ignores the `Parent` query when you specify a query as an input query or dependency query for a task.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see “Best Practices for Process Model Authoring”.

Example: `padv.builtin.query.FindModels`

Example: `padv.builtin.query.FindModels(IncludePath = "Control")`

Tags — Only include test cases with specific test case tags
string | character vector | cell array

Only include test cases that use a specific test case tag or tags, specified as a string, a character vector, or cell array.

Example: `"TagA"`

Example: `{"tag1","tag2"}`

Data Types: `char` | `string` | `cell`

Properties

`IncludeLabel` — Find artifacts with specific project label
cell array

Find artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Category","Label"}`

Data Types: `cell`

`ExcludeLabel` — Exclude artifacts with specific project label
cell array

Exclude artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Category","Label"}`

Data Types: `cell`

`IncludePath` — Find artifacts where path contains specific text
string

Find artifacts where the path contains specific text, specified as a string.

Example: `"Control"`

Data Types: `string`

`ExcludePath` — Exclude artifacts where path contains specific text
string | character vector

Exclude artifacts where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `string`

Tags — Only include test cases with specific test case tags
string | character vector | cell array

Only include test cases that use a specific test case tag or tags, specified as a string, a character vector, or cell array.

Example: `"TagA"`

Example: `{"tag1","tag2"}`

Data Types: `char` | `string` | `cell`

`Title` — Query title
`"All test cases for a given model"` (default) | string | character vector

Query title, specified as a string or a character vector.

Example: `"Find my test cases"`

Data Types: `string`

`DefaultArtifactType` — Default artifact type returned by query
`"sl_test_case"` (default) | ...

Default artifact type returned by the query, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file

Artifact Type	Description
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

Example: `"sl_test_case"`

Example: `["sl_test_case" "other_file"]`

`Parent` — Initial query run before iteration query
`"padv.builtin.query.FindModels"` (default) | `padv.Query` object | Name of `padv.Query` object

Initial query run before iteration query, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object. When you specify a `padv.Query` object as the iteration query for a task, the `Parent` query is the initial query that the build system runs before running the specified iteration query.

The build system ignores the `Parent` query when you specify a query as an input query or dependency query for a task.

For information on how to improve Process Advisor load times by sharing query instances across your process model, see “Best Practices for Process Model Authoring”.

Example: `padv.builtin.query.FindModels`

Example: `padv.builtin.query.FindModels(IncludePath = "Control")`

`Name` — Unique identifier for query
string

Unique identifier for query, specified as a string.

Example: "FindMyTestCases"

Data Types: string

ShowFileExtension — Show file extensions for returned artifacts
0 (false) | 1 (true)

Show file extensions in the Alias property of returned artifacts, specified as a numeric or logical 1 (true) or 0 (false). The Alias property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the Alias property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property ShowFileExtension as true.

Example: true

Data Types: logical

SortArtifacts — Setting for automatically sorting artifacts by address
true or 1 (default) | false or 0

Setting for automatically sorting artifacts by address, specified as a numeric or logical 1 (true) or 0 (false). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal sortArtifacts method in a subclass that defines a custom sort behavior. For an example, see “Sort Artifacts in Specific Order”.

The build system automatically calls the sortArtifacts method when using the process model. The sortArtifacts method expects two input arguments: a padv.Query object and a list of padv.Artifact objects returned by the run method. The sortArtifacts method should return a list of sorted padv.Artifact objects.

Example: SortArtifacts = false

Data Types: logical

FunctionHandle — Handle to function that function-based query runs
function_handle

Handle to the function that a function-based query runs, specified as a function_handle.

If you define your query functionality inside a function and you or the build system call run on the query, the query runs the function specified by the function_handle.

The built-in queries are defined inside classes and do not use the FunctionHandle.

Example: FunctionHandle = @FunctionForQuery

Data Types: function_handle

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts` that are associated with the artifact `iterationArtifact`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,iterationArtifact)`
	`    ...`
	`end`

Examples

Only Run Tests for Test Cases with Specific Tags

You can use the `FindTestCasesForModel` query in your process model to find test cases for your tasks to iterate over (`IterationQuery`) or use as inputs (`addInputQueries`). For example, suppose that you want the **Run Tests** task to only run on test cases that use the specific test case tag `TagA`. You can use the built-in query `padv.builtin.query.FindTestCasesForModel` to find the test cases and the `Tags` input argument to have the query only return test cases that use the specified test case tag. Suppose you have a project that contains test cases that use the test case tags `TagA` and `TagB`.

Consider the following process model.

```
function processmodel(pm)
    % Defines the project's processmodel

    arguments
        pm padv.ProcessModel
    end

    % Run Tests for TagA
    milTaskA = addTask(pm,padv.builtin.task.RunTestsPerTestCase(Name = "RunTestsForTagA"));
    milTaskA.Title = "Run Tests for TagA";
    milTaskA.IterationQuery = padv.builtin.query.FindTestCasesForModel(Tags = "TagA");

    % Run Tests for TagB
    milTaskB = pm.addTask(padv.builtin.task.RunTestsPerTestCase(Name = "RunTestsForTagB"));
    milTaskB.Title = "Run Tests for TagB";
    milTaskB.IterationQuery = padv.builtin.query.FindTestCasesForModel(Tags = "TagB");

end
```

This process model uses `FindTestCasesForModel` as the iteration query for the built-in task `RunTestsPerTestCase` to have the task only run for each test case that uses the specified test case tag. Note that since this process model uses multiple instances of the task `RunTestsPerTestCase`, the code specifies unique `Name` values for each task.

In Process Advisor, view the updated **Tasks** by clicking **Refresh Tasks** and switching to the **Project** view. When you run the tasks, the tasks only run on the test cases with the specified test case tags. The test case names appear under the name of the model associated with the test case.

Capabilities and Limitations

This table identifies functionality that is supported by the query.

Functionality	Supported?
Input query for task	Yes.
Iteration query for task	Yes.

See Also

`padv.builtin.task.RunTestsPerModel` | `padv.builtin.task.RunTestsPerTestCase` | `padv.builtin.query.FindModelsWithTestCases`

padv.builtin.query.FindTopModels

This query returns each of the top models in the project. You can use optional name-value arguments to filter the results. The query inherits from the `padv.Query` base class.

Syntax

`q = padv.builtin.query.FindTopModels()` finds all top models in the project.

`q = padv.builtin.query.FindTopModels(Name,Value)` find top models that meet the criteria specified by one or more name-value arguments. For example, to find top models that include `Control` in the full file path, specify `IncludePath="Control"`.

Note If you use this query as an input query and specify non-empty values for `IncludeLabel`, `ExcludeLabel`, `IncludePath`, or `ExcludePath`, your task results can unexpectedly become outdated. If you see this behavior, consider using a different query, like `padv.builtin.query.FindArtifacts`, instead. For more information and a list of queries that are not impacted by this limitation, see “Other Limitations”.

Input Arguments

Name-Value Arguments

- **`Name`** — Unique identifier for query, specified as character vector or string. Example: `"CustomQuery"`
- **`IncludeLabel`** — Find artifacts that have a specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name. Example: `{"Classification","Design"}`
- **`ExcludeLabel`** — Exclude artifacts that have a specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name. Example: `{"Classification","Design"}`
- **`IncludePath`** — Find artifacts where the path contains specific text, specified as a character vector or string. Example: `"Control"`
- **`ExcludePath`** — Exclude artifacts where the path contains specific text, specified as a character vector. Example: `"Control"`

Methods

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,~)`
	`    ...`
	`end`

Use in Process Model

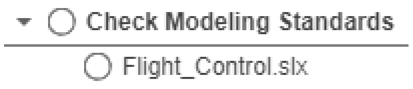
You can use this query in your process model to find artifacts that your tasks can iterate over (`IterationQuery`) or use as inputs (`InputQueries`).

For example, suppose that you want the built-in task `padv.builtin.task.RunModelStandards` to only run on top models in the project. By default, the **Check Modeling Standards** task uses the built-in query `padv.builtin.query.FindModels` as the `IterationQuery`. In the process model, you can change the `IterationQuery` for the task to:

1. Use the built-in query `padv.builtin.query.FindTopModels` to find the top models in the project.
2. Specify the `IncludePath` argument of the query to only include top models that have `Control` in the file path.

```
maTask = pm.addTask(padv.builtin.task.RunModelStandards());
maTask.IterationQuery = ...
    padv.builtin.query.FindTopModels(IncludePath = "Control");
```

For the Process Advisor example project, the model `Flight_Control.slx` appears under the task title in Process Advisor.



padv.builtin.query.FindUnits Class

Namespace: `padv.builtin.query padv.builtin.query`
Superclasses: `padv.Query`

Query for finding units

Description

The `padv.builtin.query.FindUnits` class provides a query that can return the units in your project. The query uses the same unit classification as the Model Design and Model Testing Dashboards. A unit is a functional entity in your software architecture that you can execute and test independently or as part of larger system tests. Some software development standards, like certain testing objectives, apply specifically to units in a software architecture. You can use the `FindUnits` query to find the Simulink and System Composer models in your design that you need to assess. If you need to find both the units and components in your design, you can use the built-in query `padv.builtin.query.FindDesignModels` instead. For information how to classify the models in your project, see “Categorize Models in Hierarchy as Components or Units”.

You can use this query in your process model to find the units in your project and run tasks on those artifacts. For example, you can reconfigure the built-in task `padv.builtin.task.CollectMetrics` to collect model and code testing metrics for the units in your project by specifying the task iteration query as `padv.builtin.query.FindUnits`.

The `padv.builtin.query.FindUnits` class is a `handle` class.

Creation

Description

`query = padv.builtin.query.FindUnits` creates a query for finding the units in your project.

`query = padv.builtin.query.FindUnits(Name=Value)` sets certain properties using one or more name-value arguments. For example, `query = padv.builtin.query.FindUnits(ExcludePath = "Control")` creates a query that finds the units in the project, but excludes units that have `"Control"` in the file address.

The `padv.builtin.query.FindUnits` class also has other properties, but you cannot set those properties during query creation.

Input Arguments

Name-Value Pair Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `query = padv.builtin.query.FindUnits(ExcludePath = "Control")`

`ExcludeLabel` — Exclude artifacts with specific project label
cell array

Exclude artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`ExcludePath` — Exclude artifacts where path contains specific text
string | character vector

Exclude artifacts where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `char` | `string`

`IncludeLabel` — Find artifacts with specific project label
cell array

Find artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePath` — Find artifacts where path contains specific text
string | character vector

Find artifacts where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `char` | `string`

`Name` — Unique identifier for query
string | character vector

Unique identifier for query, specified as a string or a character vector.

Example: `"FindUnits"`

Data Types: `char` | `string`

Properties

`IncludeLabel` — Find artifacts with specific project label
cell array

Find artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`ExcludeLabel` — Exclude artifacts with specific project label
cell array

Exclude artifacts with specific project label, specified as a cell array where the first entry is the project label category and the second entry is the project label name.

Example: `{"Classification","Design"}`

Data Types: `cell`

`IncludePath` — Find artifacts where path contains specific text
string | character vector

Find artifacts where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `char` | `string`

`ExcludePath` — Exclude artifacts where path contains specific text
string | character vector

Exclude artifacts where the path contains specific text, specified as a string or a character vector.

Example: `"Control"`

Data Types: `char` | `string`

`Title` — Query title
`"All Unit models in project"` (default) | string | character vector

Query title, specified as a string or a character vector.

Example: `"Units"`

Data Types: `char` | `string`

`DefaultArtifactType` — Default artifact type returned by query
`"sl_model_file"` (default) | `"zc_file"` | ...

Default artifact type returned by the query, specified as one or more of the values in this table. To specify multiple values, use an array.

Artifact Type	Description
`"harness_info_file"`	Harness info file
`"m_class"`	MATLAB class
`"m_file"`	MATLAB file
`"m_func"`	MATLAB function
`"m_method"`	MATLAB class method
`"m_property"`	MATLAB class property
`"ma_config_file"`	Model Advisor configuration file
`"ma_justification_file"`	Model Advisor justification file
`"other_file"`	Other file
`"padv_output_file"`	Process Advisor output file
`"sf_chart"`	Stateflow chart

Artifact Type	Description
`"sf_graphical_fcn"`	Stateflow graphical function
`"sf_group"`	Stateflow group
`"sf_state"`	Stateflow state
`"sf_state_transition_chart"`	Stateflow state transition chart
`"sf_truth_table"`	Stateflow truth table
`"sl_block_diagram"`	Block diagram
`"sl_data_dictionary_file"`	Data dictionary file
`"sl_embedded_matlab_fcn"`	MATLAB function
`"sl_harness_block_diagram"`	Harness block diagram
`"sl_harness_file"`	Test harness file
`"sl_library_file"`	Library file
`"sl_model_file"`	Simulink model file
`"sl_protected_model_file"`	Protected Simulink model file
`"sl_req_table"`	Requirements Table
`"sl_subsystem"`	Subsystem
`"sl_subsystem_file"`	Subsystem file
`"sl_test_case"`	Simulink Test case
`"sl_test_case_result"`	Simulink Test case result
`"sl_test_file"`	Simulink Test file
`"sl_test_iteration"`	Simulink Test iteration
`"sl_test_iteration_result"`	Simulink Test iteration result
`"sl_test_report_file"`	Simulink Test result report
`"sl_test_result_file"`	Simulink Test result file
`"sl_test_resultset"`	Simulink Test result set
`"sl_test_seq"`	Test Sequence
`"sl_test_suite"`	Simulink Test suite
`"sl_test_suite_result"`	Simulink Test suite result
`"zc_block_diagram"`	System Composer architecture
`"zc_component"`	System Composer architecture component
`"zc_file"`	System Composer architecture file

Example: `"zc_file"`

Example: `["sl_model_file" "zc_file"]`

`Parent` — Query that build system can run first
`padv.Query` object | `Name` of `padv.Query` object

Query that the build system can run first, specified as either a `padv.Query` object or the `Name` of a `padv.Query` object.

If you use `padv.builtin.query.FindUnits` as an iteration query in your process model, the build system automatically runs the `Parent` query first. If there is an existing query that you want the build system to run first, specify that query as the `Parent` query. For example, the built-in query `FindModelsWithTestCases` specifies `FindModels` as a `Parent` query .

If you use `padv.builtin.query.FindUnits` as an input query or dependency query for a task, the build system ignores the `Parent` query.

Name — Unique identifier for query
string | character vector

Unique identifier for query, specified as a string or a character vector.

Example: `"FindUnits"`

Data Types: `char` | `string`

`ShowFileExtension` — Show file extensions for returned artifacts
`0` (`false`) | `1` (`true`)

Show file extensions in the `Alias` property of returned artifacts, specified as a numeric or logical `1` (`true`) or `0` (`false`). The `Alias` property controls the display name for the artifact in the **Tasks** column in Process Advisor.

By default, queries strip file extensions from the `Alias` property of each task iteration artifact. To show file extensions for all artifacts in the **Tasks** column, select the project setting **Show file extensions**. To keep file extensions in the results for a specific query, specify the query property `ShowFileExtension` as `true`.

Example: `true`

Data Types: `logical`

`SortArtifacts` — Setting for automatically sorting artifacts by address
`true` or `1` (default) | `false` or `0`

Setting for automatically sorting artifacts by address, specified as a numeric or logical `1` (`true`) or `0` (`false`). When a query returns artifacts, the artifacts should be in a consistent order. By default, the build system sorts artifacts by the artifact address.

Alternatively, you can sort artifacts in a different order by overriding the internal `sortArtifacts` method in a subclass that defines a custom sort behavior. For an example, see "Sort Artifacts in Specific Order" in the User's Guide PDF.

The build system automatically calls the `sortArtifacts` method when using the process model. The `sortArtifacts` method expects two input arguments: a `padv.Query` object and a list of `padv.Artifact` objects returned by the `run` method. The `sortArtifacts` method should return a list of sorted `padv.Artifact` objects.

Example: `SortArtifacts = false`

Data Types: `logical`

`FunctionHandle` — Handle to function that function-based query runs
`function_handle`

Handle to the function that a function-based query runs, specified as a `function_handle`.

If you define your query functionality inside a function and you or the build system call `run` on the query, the query runs the function specified by the `function_handle`.

The built-in queries are defined inside classes and do not use the `FunctionHandle`.

Example: `FunctionHandle = @FunctionForQuery`

Data Types: `function_handle`

Methods

Specialized Public Methods

This class overrides the following inherited methods.

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,~)`
	`    ...`
	`end`

Examples

Find Units for Task in Process

You can use the `FindUnits` query in your process model to find units and components that your tasks can iterate over (`IterationQuery`) or use as inputs (`InputQueries`). For example, suppose you have a custom task that you want to run for each unit in your project. You can find the units in your project by using the built-in query `FindUnits`.

Open a project. For this example, open the Process Advisor example project.

```
processAdvisorExampleStart
```

To have the custom task run for each unit, specify the `FindUnits` query as the iteration query for the task. For example, in your process model:

```
pm.addTask("MyCustomTask",...
    IterationQuery = padv.builtin.query.FindUnits);
```

In Process Advisor, view the updated **Tasks** by clicking **Refresh Tasks** and switching to the **Project** view. For the task `MyCustomTask`, there is one task iteration for each unit in the project. The Process Advisor example project four units: `AHRS_Voter`, `Actuator_Control`, `InnerLoop_Control`, and `OuterLoop_Control`.

To view how the example project is classifying units and components, open the options for the Model Testing Dashboard.

```
modelTestingDashboard
```

In the dashboard toolstrip, click **Options**. The **Classification** section shows that the digital thread classifies models with the project label `Software Component` as components and models with the project label `Software Unit` as units.

For information how to classify the models in your project, see "Categorize Models in Hierarchy as Components or Units".

Test Query Locally in Command Window

If you want to test a query before using the query in your process model, you can run the query directly from the MATLAB Command Window.

Open a project. For this example, open the Process Advisor example project.

```
processAdvisorExampleStart
```

In the MATLAB Command Window, create a query object that represents the query.

```
q = padv.builtin.query.FindUnits;
```

Run the query by using the `run` method. The query returns the artifacts that it finds as a `padv.Artifact` object or an array of `padv.Artifact` objects.

```
artifacts = q.run
```

```
artifacts = 

  1×4 Artifact array with properties:

    Type
    Parent
    ArtifactAddress
    Alias
```

You can inspect the properties of each `padv.Artifact` object to view information about the artifact. For example, you can use the `Alias` property to view the artifact names.

```
artifacts.Alias
```

```
ans = 

    "OuterLoop_Control.slx"
```

```
ans = 

    "AHRS_Voter.slx"


ans = 

    "Actuator_Control.slx"


ans = 

    "InnerLoop_Control.slx"
```

The `Alias` property returns the artifact names as they appear in Process Advisor.

Capabilities and Limitations

This table identifies functionality that is supported by the query.

Functionality	Supported?
Input query for task	Yes. See InputQueries.
Iteration query for task	Yes. See IterationQuery.

Note If you use this query as an input query and specify non-empty values for `IncludeLabel`, `ExcludeLabel`, `IncludePath`, or `ExcludePath`, your task results can unexpectedly become outdated. If you see this behavior, consider using a different query, like `padv.builtin.query.FindArtifacts`, instead. For more information and a list of queries that are not impacted by this limitation, see “Other Limitations”.

See Also

`padv.Artifact` | `padv.builtin.task.CollectMetrics` | `padv.builtin.query.FindDesignModels`

Topics

“Categorize Models in Hierarchy as Components or Units”

padv.builtin.query.GetDependentArtifacts

This query returns the dependent artifacts for a given artifact. The query inherits from the `padv.Query` base class.

Syntax

`q = padv.builtin.query.GetDependentArtifacts()` gets the dependent artifacts for a given artifact.

Methods

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts` that are associated with the artifact `iterationArtifact`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,iterationArtifact)`
	`    ...`
	`end`

Use in Task

You can use this query in your custom tasks to find artifacts that your tasks can use as inputs (`InputQueries`).

For example, the query `padv.builtin.query.GetDependentArtifacts` is often used as the `InputDependencyQuery` for a task. If you specify `padv.builtin.query.GetDependentArtifacts` as the `InputDependencyQuery` for a task, the query analyzes each input and finds additional file dependencies.

```
classdef MyCustomTask < padv.Task
    methods
        function obj = MyCustomTask(options)
            arguments
                options.Name = "MyCustomTask";
                options.IterationQuery = "padv.builtin.query.FindModels";
                options.InputQueries = "padv.builtin.query.GetIterationArtifact";
                % For each input, find dependencies that impact if the
                % task results are up-to-date
                options.InputDependencyQuery = padv.builtin.query.GetDependentArtifacts;
            end

            obj@padv.Task(options.Name,...
                IterationQuery=options.IterationQuery,...
                InputQueries=options.InputQueries,...
                InputDependencyQuery=options.InputDependencyQuery);
        end
        function taskResult = run(obj,input)
            taskResult = padv.TaskResult;
            taskResult.Status = padv.TaskStatus.Pass;
        end
    end
end
```

When you run a task, the build system runs the `InputDependencyQuery` to find additional dependencies that can affect whether task results are up-to-date.

Note You cannot use this query as an iteration query (`IterationQuery`).

padv.builtin.query.GetIterationArtifact

This query returns the artifact that the task is iterating over. The query inherits from the `padv.Query` base class.

Syntax

`q = padv.builtin.query.GetIterationArtifact()` gets the artifact that the task is iterating over.

Methods

`run`	Return artifacts from query
	
	The `run` method inside this built-in query returns the iteration artifact `iterationArtifact`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifact = run(~,iterationArtifact)`
	`    artifact = iterationArtifact;`
	`end`

Use in Task

You can use this query in your custom tasks to find artifacts that your tasks can use as inputs (`InputQueries`).

For example, the query `padv.builtin.query.GetIterationArtifact` is often used as one of the input queries (`InputQueries`) for a task. If your `IterationQuery` is `padv.builtin.query.FindModels` and you specify `padv.builtin.query.GetIterationArtifact` as an input query for a task, the task considers the models in the project as inputs to the task.

```
classdef MyCustomTask < padv.Task
    methods
        function obj = MyCustomTask(options)
            arguments
                options.Name = "MyCustomTask";
                options.IterationQuery = "padv.builtin.query.FindModels";
                options.InputQueries = "padv.builtin.query.GetIterationArtifact";
            end

            obj@padv.Task(options.Name,...
                IterationQuery=options.IterationQuery,...
                InputQueries=options.InputQueries,...
                InputDependencyQuery=options.InputDependencyQuery);
        end
        function taskResult = run(obj,input)
            taskResult = padv.TaskResult;
            taskResult.Status = padv.TaskStatus.Pass;
        end
    end
end
```

When you run a task, the build system runs the `InputQueries` to find the inputs to the task.

Note You cannot use this query as an iteration query (`IterationQuery`).

padv.builtin.query.GetOutputsOfDependentTask

This query returns the outputs from the predecessor task. The query inherits from the `padv.Query` base class.

Syntax

`q = padv.builtin.query.GetOutputsOfDependentTask()` gets the outputs from the predecessor task. You must define the predecessor task by using the function `dependsOn` on the task objects.

`q = padv.builtin.query.GetOutputsOfDependentTask(Task=taskName)` gets the outputs from the predecessor task specified by `taskName`.

`q = padv.builtin.query.GetOutputsOfDependentTask(Name = queryName, Task= taskName)` gets the outputs from the predecessor task specified by `taskName`. The query object gets the name specified by `queryName`. If you do not specify a query name, the query automatically generates a unique name based on the name of the predecessor task.

Input Arguments

Name-Value Arguments

- **`Name`** — Unique identifier for query, specified as character vector or string. Example: `"CustomQuery"`
- **`Task`** — Task name, specified as a character vector or string. Example: `"padv.builtin.task.RunModelStandards"`

Methods

`run`	Run query to find the artifacts that meet the criteria specified by the query.
	
	The query returns a `padv.Artifact` object or an array of `padv.Artifact` objects that represent those artifacts.
	
	Note You do not need to manually invoke this method inside your process model. The build system automatically invokes the `run` method to find artifacts.
	
	The `run` method inside this built-in query runs on a query object `obj` and returns artifacts `artifacts`. If you inherit from this built-in query, make sure to use the same method signature inside your custom query:
	
	`function artifacts = run(obj,~)`
	`    ...`
	`end`

Use in Task

You can use this query in your custom tasks to find artifacts that your tasks can use as inputs (`InputQueries`).

For example, the query `padv.builtin.query.GetOutputsOfDependentTask` is often used as one of the input queries (`InputQueries`) for a task. If you open the source code for the **Merge Test Results** task, you can see that the task uses the built-in query `padv.builtin.query.GetOutputsOfDependentTask` as an input query.

```
open padv.builtin.task.MergeTestResults
```

```
...
options.InputQueries = [padv.builtin.query.GetIterationArtifact,...
    padv.builtin.query.GetOutputsOfDependentTask(Task="padv.builtin.task.RunTestsPerTestCase")];
options.InputDependencyQuery = padv.builtin.query.GetDependentArtifacts;
...
```

When you run the **Merge Test Results** task, the build system runs this input query, which passes the outputs of the **Run Tests** task as inputs to the **Merge Test Results** task.

Note Note that since the **Merge Test Results** task depends on data from the **Run Tests** task, the default process model uses the `dependsOn` function to explicitly specify the dependency relationship between the tasks.

```
if includeTestsPerTestCaseTask && includeMergeTestResultsTask
    mergeTestTask.dependsOn(milTask, "WhenStatus",{'Pass','Fail'});
end
```