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Projects

Create a Forecasting Project

Use Model Studio to create a project for SAS Visual Forecasting.

View the slideshow in SAS Help Center.

Using The Exchange

The Exchange in Model Studio provides a list of templates used for project pipelines and modeling nodes. Each template includes a description, the product type for the project, the name of the owner who created the template, and the date on which it was last modified. The templates are specific to the type of project: Forecasting, Text Analytics, or Data Mining and Machine Learning.

View the slideshow in SAS Help Center.

See Also

“Create Reusable Project Templates” on page 1

Create Reusable Project Templates

Use The Exchange in Model Studio to share template pipelines and modeling nodes for use in other projects. For more information about templates, see “Using The Exchange” on page 1.

View the slideshow in SAS Help Center.
Import Projects from SAS Forecast Studio

Users in the SAS Administrators group can import projects from SAS Forecast Studio.

View the slideshow in SAS Help Center.

See Also


Segment Project Data

Segmentation is a process of dividing the time series data into mutually exclusive sets of similar characteristics or patterns. You can then apply and fine-tune different modeling strategies to each of the segments within a pipeline. This exercise describes how to segment project data by importing a specific attribute that contains a segmentation value.

View the slideshow in SAS Help Center.

Add Predefined and Custom Events to Your Project

You can improve the accuracy of your forecasting models by adding events. Examples of events are holidays, retail promotions, and natural disasters. Defining an event enables you to model the effect that special events have on the dependent variable.

View the slideshow in SAS Help Center.
# Pipelines

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Using the Pipelines Tab

Initial Pipeline for a New Project

Pipelines consist of a series of nodes that are run in a sequence to produce forecasts based on the models and settings that you choose for the project. After you first create a project, the pipeline is set up in the Pipelines tab. The pipeline is labeled Pipeline 1.

By default, the initial pipeline for a project uses the template specified when the project was created. You can create new pipelines using different templates and you can make changes to the initial pipeline.

The pipeline cannot be run until you assign the required variable roles as described in "Assigning Variable Roles" in SAS Visual Forecasting: User’s Guide.

See Also
- “Nodes Panel” on page 7
- “Options Panel” on page 7

Creating a New Pipeline

1. Click + to create a new pipeline. The New Pipeline dialog box is displayed.

2. For Name, change the value to any meaningful string. You can change the pipeline name at any time. After the pipeline is created, you can change the pipeline name by double-clicking the name in the tab.


4. Optional. When the new pipeline is loaded to the page, you can add a formatted description to it. Click ‥ and select Expand header.
   A header section appears along the top of the pipeline. You can add text and use the tools provided to format it.
Node Status
As you look at a pipeline, hold your pointer over each node to see its status.

- When you first create the pipeline, all nodes have a status of **Initialized**.
- After a node in the pipeline has successfully finished execution, the node shows a status of **Successful**.
- A node with a status of **Pending** is waiting for other nodes in the pipeline to complete before starting.
- When a node starts executing its functions, its status is **Running**. You cannot make any changes to the node until it finishes running.
- If a pipeline run fails, check to see which node has a **Failed** status.
- If you make any changes to the project settings or variable assignments, the nodes will change to **Out-of-date** status and the pipeline needs to be run again.
- When running a pipeline, if a node fails for any reason, the status of the subsequent nodes in the pipeline show **Canceled**.

Actions on Nodes in the Pipeline
Right-click any node in a pipeline to open a menu of actions.

- Select **Run** to run the node. Any preceding nodes in the pipeline that do not have a status of **Successful** are run first. After the preceding nodes complete successfully, the selected node runs.
- Select **Rename** to rename a node. The new name applies only to the node on this pipeline.
- Select **Log** to view a log of the node’s processing. This option is enabled after running the node.

Data Node Actions
Right-click the data node to open these actions in the menu.

- Select **Add child node** to add a forecasting modeling node to the pipeline. You cannot add child nodes in the External Segmentation or Demand Classification pipelines.
- After the data node has completed a run, select **Time series viewer** to open a plot of the historical data. See “Viewers for Time Series in your Project” in SAS Visual Forecasting: User’s Guide for more information.

Note: If the input data for the project is very large, running the Data node can take a long time. Data node processing is described in “Running the Forecast Pipeline” in SAS Visual Forecasting: User’s Guide.
Modeling Strategy Actions

Right-click any modeling node to get these actions in the menu.

- Select **Delete** to remove the node from the pipeline. If it is the only modeling node in the pipeline, then the Model Comparison and Output nodes are also removed.
  
  **Note:** You cannot delete nodes from the External Segmentation or Demand Classification pipelines.

- Select **Open** to open the code editor for the node. This option is available only for **pluggable** modeling strategy nodes.
  
  **Note:** The **Open** action is different on nodes in a segmented pipeline. See “Customizing Each Segment” in SAS Visual Forecasting: User’s Guide for more information.


- After the modeling strategy has completed a run, select **Forecast viewer** to open a plot of the time series, including historical and forecast data. See “Viewers for Time Series in your Project” in SAS Visual Forecasting: User’s Guide for more information.

- Select **Save as** to save the node, with any settings you have made in the Options panel on the right, to The Exchange. This makes the saved node available for other projects.

- Select **Results** to view the results of the modeling strategy, including an execution summary, MAPE distribution, and other relevant data. For more information, see “Viewing the Results for a Modeling Strategy Node” in SAS Visual Forecasting: User’s Guide.

- After the modeling strategy has run, you can select **View code** to get a read-only view of the code for the modeling strategy.

Segmentation Nodes

For segmented pipelines, you have these nodes to work with.

Profile Nodes
- **External Segmentation Profile**
- **Demand Classification Profile**

Modeling Nodes
- **External Segmentation Modeling**
- **Demand Classification Modeling**

**Merge Segments**
Merges the results produced by the segments.

For more information about actions on these nodes, see “Customizing Each Segment” in SAS Visual Forecasting: User’s Guide.

Model Comparison Node Actions

Right-click the **Model Comparison** node to get these actions in the menu.

- Select **Results** to view the MAPE distribution and summary statistics for each modeling node along with the selected champion model in the pipeline.

- Select **Select champion model** to choose a champion model other than the one selected by the Model Comparison. If you choose a different champion model, you need to rerun the Model Comparison and Output nodes.
**Actions on the Pipeline**

Click on the pipeline tab to perform these actions.

**Run**
Runs the entire pipeline.

**Stop**
If the pipeline is running, this action stops the run.

**Duplicate**
Creates a duplicate pipeline. The name is appended with a number. You can rename the duplicate after it is created.

Segmented pipelines cannot be duplicated.

**Rename**
Renames the pipeline.

**Save to The Exchange**
Saves the pipeline with the nodes and any settings applied to those nodes as a template to The Exchange. The new templates can be used in other projects.

**Delete**
Deletes the pipeline from the project. At least one pipeline must exist in a project. If only one pipeline exists, this action is disabled.

**Show overview map**
Places a map of the pipeline in the upper left corner.

**Expand header**
Provides a space at the top of the tab to add a description or other text that might be useful. The text can be formatted.

**Nodes Panel**

On the left side of the pipeline is the Nodes panel. This panel lists the modeling strategy nodes that you can add to any pipeline.

If the Nodes panel is not displayed, click on the left side of the pipeline to open it. You can collapse the panel again by clicking .

You can drag a modeling node over the Data node in the pipeline to add it. To remove a modeling node, right-click the node and select **Delete**. Each pipeline requires at least one modeling strategy node.

**Options Panel**

The Options panel on the right side of the pipeline displays options that you can set for a selected node in the pipeline.

If the Options panel is not displayed, click to open it. You can collapse the panel again by clicking .

- All nodes in the pipeline have a **Description** option that you can update. Any description you provide is saved for the node only in the pipeline. The description for the node template in The Exchange is not affected by any updates that you make in the pipeline.

- **Pluggable models** that are nodes have an **Open** button that you can use to view and edit the code inline. See “Customizing a Pluggable Modeling Strategy” in *SAS Visual Forecasting: User’s Guide* for more information.
After running a pipeline, any subsequent changes to the options for a modeling node move the pipeline back to out-of-date state. This is also true if you make a change and then change the setting back to the original value.

When a pipeline is running, the options for each modeling node in the pipeline cannot be changed until the pipeline completes. If you need to make further updates to a modeling node after starting the pipeline, click Stop Pipeline and wait for the pipeline to stop operation before you make any changes.

### Compare Modeling Nodes in a Pipeline

Each pipeline must have one or more modeling nodes. The Model Comparison node shows the best model based on the selection criteria that you choose. If only one modeling node is present in the pipeline, it still provides an assessment of the accuracy of the model.

View the slideshow in SAS Help Center.

### Create a Segmented Pipeline

You can run different modeling strategies on different segments of your data. In SAS Visual Forecasting 8.4, there are two types of segmented pipelines.

- The External Segmentation pipeline on page 8 segments the time series using an attribute that you import from an external data set after the project has been created.
- The Demand Classification pipeline on page 8 segments the time series based on demand patterns derived from the time series in your project, such as seasonality, intermittence, or length of time span.

### Create an External Segmentation Pipeline

Before starting this exercise, make sure you have created the segmented attributes data set as described in “Segment Project Data” on page 2.

View the slideshow in SAS Help Center.

### Create a Demand Classification Pipeline

Demand classification uses analytical and statistical methods to classify demand patterns in time series data. Demand patterns in each time series are classified based on evaluating the demand life cycle, intermittency, and seasonality. The time series are segmented and assigned the best pipeline template for the demand pattern in the segment.

View the slideshow in SAS Help Center.

### Create Filters

Create filters to view and work with different subsets of time series in your project. Each filter is created using selected values of project attributes.

View the slideshow in SAS Help Center.
See Also

Overrides

Create Overrides

View the slideshow in SAS Help Center.
Collaborating

Share Projects to Other Groups

This exercise demonstrates how to share your forecasting projects with other users.

View the slideshow in SAS Help Center.
Reference

Code Samples
This section provides code samples that can be copied and pasted into SAS Studio for some of the exercises.

Start a CAS Session
These three statements can start a CAS session in SAS Studio with Public as the active library.

```sas
cas casauto;
libname mycas cas;
options cassessopts=(caslib="Public");
```

Add a Segment Variable to an Attributes Data Set
The following code provides a simple example for adding a _SEG_ variable to the SKINPRODUCT_ATTRIBUTES data set. This data set is available in the sample data sets for SAS Visual Forecasting. The segments are created based on the value of the Venue variable in the skinproduct_attributes data set.

```sas
data mycas.segment_attr (promote=yes);
  set mycas.skinproduct_attributes;
  length _seg_ $20;
  if Venue = 'Catalog' then _seg_ = 'Catalog';
  if Venue = 'Grocery Store' then _seg_ = 'Grocery Store';
  if Venue = 'Internet' then _seg_ = 'Internet';
  if Venue = 'Outlet Store' then _seg_ = 'Outlet Store';
  if Venue = 'Third Party Vendor' then _seg_ = 'Third Party Vendor' ;
run;
```