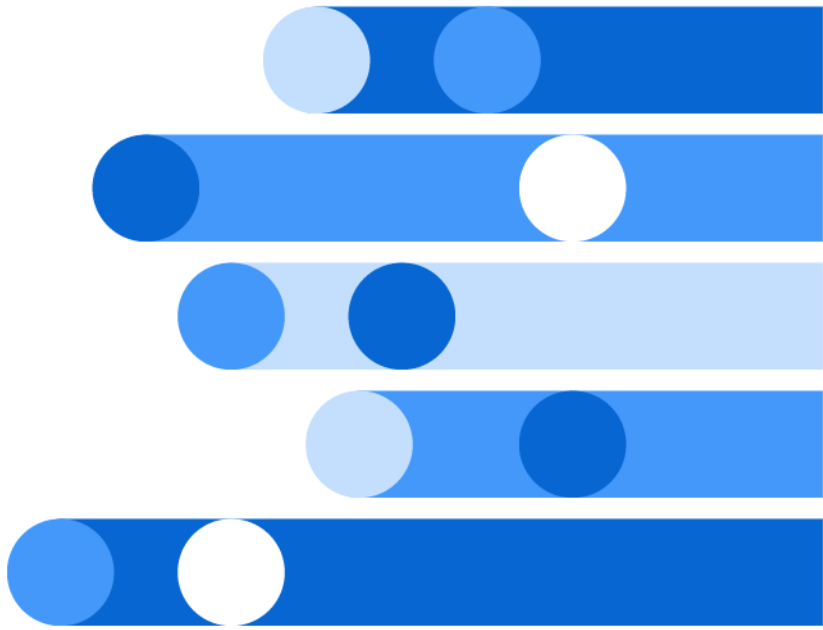
What's New in SAS® Studio

2020.1 - 2026.04*



* This document might apply to additional versions of the software. Open this document in SAS Help Center and click on the version in the banner to see all available versions.

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What's New in SAS® Studio

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Long-Term Support Releases

LTS 2025.09 (November 2025)

New User Interface

The June release of SAS Studio contains a new front-end framework. This new interface includes significant performance improvements. All content (for example, flows, programs, and custom steps) that was developed in previous releases of SAS Studio on the SAS Viya 4 platform works in this new interface and does not require migration. In addition to the new user interface, SAS Studio includes many new features and enhancements.

IMPORTANT After you open a flow in the React version of SAS Studio, you cannot open this flow in a previous OpenUI5 release of SAS Studio.

Deprecated Features

These features are no longer supported and are not available starting in the 2025.06 (June) release of SAS Studio: interactive perspective, application command line, and the Console pane. Most of the functionality from the Console pane is now available in the Submission and Job Status window.

End of Life: SAS Tasks

The task functionality reached end of life in the 2024.12 stable release and in the LTS 2025.03 release. SAS recommends users convert any existing tasks to custom steps as soon as possible. Read more

Features for an Upcoming Release

Several features (that were available in previous releases of SAS Studio) will be added in a future release.

- DATA Step Debugger

- search bar
- in the File and Folder selector, the ability to create a folder on a SAS server
- undo and redo for flows
- in a step in a flow, the ability to filter by column type in the column structure (or published columns) view
- displaying the error and warning icons on the **Code** tab
- the ability to navigate to offscreen tabs in an overflow menu
- in the Submission and job status pane, the **Next Run Time** field
- in the Favorites and Recents views, displaying the location of an item
- in the Query step, the automatic creation of a port when you try to connect to a node that has no empty ports

Performing Impact Analysis

You can use impact analysis to help identify the potential consequences of making a change to a table or column. You can run an impact analysis on a table and then select columns from the table to analyze as well. Read more

You can run two types of impact analysis:

- Forward impact analysis enables you to identify any tables, columns, flows, or steps that are affected by a change to a selected table or column.
- Reverse impact analysis traces the sources that contribute to the content of a selected table or column.

Working with Flows

The flow functionality includes several new features. Read more

- Flows now use curved arrows.
- When no step is selected in the flow, the Details pane is hidden.
- Some steps can be opened on a new tab and used outside of a flow. The availability of a step depends on your SAS Studio license. For more information, see "Summary of Custom Steps Functionality" in *SAS Studio: User's Guide*.
- The step categories can be sorted alphabetically. You can also choose to hide selected categories.
- A Code Generation option is now available from the toolbar.
- When importing a file in a flow, you are no longer required to first add a File node to the flow. You can expand the input and outport ports of the new step to see the file representation. For more information, see "Importing Data from an External File" in *SAS Studio: Working with Flows*.

- You can now display the output ports for the Load Table, Merge Table, and Implement SCD. When you hover your pointer over the output port, you see the name of the output table.

Adding Status Handling to a Flow

You can use the status handling feature to send the flow status to a specified table after the flow is finished running. Read more

Adding Snippets to a Flow as Embedded Programs

You can add snippets to the flow from the Snippets section of the navigation pane. Snippets are added to the flow as embedded programs. Read more

Using Undo and Redo in a Flow

You can undo and redo actions that affect the flow canvas, including adding and deleting nodes, ports, connections, and swimlanes. You can also undo and redo any manual or automatic reordering of nodes in the flow. Read more

Working with Steps

General Enhancements

In the custom steps interface, the controls and sections are rearranged for a better user experience. Also, the drag-and-drop functionality is improved. Finally, the Shared tab in the Steps pane is renamed Custom Steps.

Working with Machine Learning

Neural Network Step

The Neural Network step creates a multilayer perceptron neural network. You can create networks with up to 10 hidden layers. Read more

Generating Statistics

Generalized Linear Models Step

The Generalized Linear Models step provides model fitting and model building for generalized linear models. It fits models for standard distributions such as Normal, Poisson, and Tweedie in the exponential family. This step also fits multinomial models for ordinal and nominal responses. The step provides forward, backward, and stepwise selection methods. The Generalized Linear Models step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Mixed Models Step

The Mixed Models step fits a variety of mixed linear models to data and enables you to use these fitted models to make inferences about the data. A mixed linear model is a generalization of the standard linear model. The generalization is that the data is permitted to exhibit correlation and nonconstant variability. Therefore, the mixed linear model provides the flexibility to model the means of your data (as in the standard linear model) and also the variances and covariances. Read more

N-Way ANOVA Step

The N-way ANOVA step tests and provides graphs for effects of one or more factors on the means of a single, continuous dependent variable. The N-way ANOVA step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Proportional Hazards Regression Step

The Proportional Hazards Regression step fits proportional hazards regression models to survival data. These models include the widely used semi-parametric Cox regression model and its extensions, such as the shared frailty model and the Fine-Gray model. The step supports the analysis of data that might be left-censored, right-censored, or interval-censored. Read more

Enrichment

Verify with Loqate Step

You can now choose your external endpoint. Select the Do not use the Loqate external point option if you want to point to a local container for verifying addresses instead of using the Loqate service. The Verify with Loqate step is available if your site licenses SAS Studio Basic, SAS Studio Analyst, or SAS Studio Engineer. Read more

Econometrics

Cross-Sectional Data Models Step

The Cross-Sectional Data Models step applies econometric techniques to analyze cross-sectional data. The Cross-Sectional Data Models step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Multivariate Time Series Analysis Step

The Multivariate Time Series Analysis step analyzes a vector of time series that are equally spaced. The Multivariate Time Series Analysis step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Univariate Time Series Analysis Step

The Univariate Time Series Analysis step analyzes a single time series in which the values are equally spaced. This task provides analysis for these model types: ARIMA (autoregressive integrated moving average), ARIMAX, unobserved components, and regression with autocorrelated and heteroscedastic errors. The Univariate Time Series Analysis step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Forecasting Data

Modeling and Forecasting Step

The Modeling and Forecasting step creates forecasting models that use your time series data. This step requires data in a valid time series format. The Modeling and Forecasting step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Motif Discovery Step

The Motif Discovery step provides methods to discover frequent patterns or repeated subsequences in time series data. The Motif Discovery step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Motif Scoring Step

The Motif Scoring step tries to find subsequences that are most similar to the target sequence in a new time series. The Motif Scoring step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Similarity Analysis Step

The Similarity Analysis step provides methods to measure the similarity between two time series or among sequences in temporal data. The Similarity Analysis step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Subsequence Anomaly Detection Step

The Subsequence Anomaly Detection step is a motif-based technique that finds anomaly subsequences in a specified input sequence. The Subsequence Anomaly Detection step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Preparing Data

Sample Data Step

The Sample Data step performs simple or stratified random sampling or oversampling of the input data source. The Sample Data step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Steps: Filter for Input Table Control

For a standalone custom step, you can allow the step user to filter the rows in the input table. Filtering is not available when running a step in a flow. Read more

Working with Git

The user interface for the Manage Git Connections window is improved. Read more

General Application Improvements

With the redesign of SAS Studio, you can expect several application improvements. Read more

- The new SAS Server and SAS Content panes replace the Explorer pane. When you delete a folder in SAS Server or SAS Content, the deletion is recursive. For more information, see "Accessing SAS Server and SAS Content Locations" in *SAS Studio: User's Guide*.

- More properties are available for files and folders. A confirmation window appears when you move a file or folder.
- The Start page now includes a link to create a Python program and a link to the SAS Studio home page on sas.com.
- To set your preferences, click the Profile icon and select **Settings**. For more information, see "About Customizing SAS Studio" in *SAS Studio: User's Guide*.
- The column selector now displays both the column name and the column label.
- The new Submissions and Job Status tab replaces the Submission Status and the Deployed and Scheduled Jobs tabs. For more information, see "Using the Submissions and Job Status Tab" in *SAS Studio: User's Guide*.

Updates to the Libraries Pane

The Libraries pane contains several enhancements. Read more

- A new Connection Manager window is available. For more information, see "Working with Library Connections" in *SAS Studio: User's Guide*.
- The division between basic and advanced options is clearer.
- A search is now available in advanced options and in the libraries list.
- The split between connected libraries and saved definitions is clearer.

Programming Enhancements

For programmers, SAS Studio includes several key enhancements. Read more

- a faster code editor for SAS and Python programs.
- syntax suggestion in the Python code editor.
- improved syntax help menu for SAS programs.
- new Find and Replace functionality, which replaces regular expressions.
- a minimap for the code. For more information, see "About the SAS Code Editor" in *SAS Studio: User's Guide*.

Note: The new code editor uses a feature-rich, industry-proven, open source base editor and provides a significant number of new features and enhancements. The previous list provides just a few examples of this new functionality. The change in editors also means that you might see some changes in behavior from previous releases of SAS Studio.

Table Viewer

The Table Viewer includes these enhancements. Read more

- The Table Viewer is more compact.
- SAS Studio now provides infinite scrolling in the table.
- You can now copy and paste a range of cells.
- In a current view, you can autosize all of the columns.
- You can use the go-to-row functionality to quickly move to a row in the table.
- You can now display the column names and column labels at the same time.
- SAS Studio saves any quick filters that you create within the current session and across SAS Studio sessions.
- By default, a maximum of 5,000 columns is displayed when you open a table. Use the SAS Studio settings to change this value.
- You now have the option to view both the formatted and unformatted data values.

For more information, see "About the Table Viewer" in *SAS Studio: User's Guide*.

Working with Queries

The query functionality has been improved through these enhancements. Read more

- improved experience when working with date, time, and timestamp values in a filter
- ability to perform aggregations in the Selected Columns pane
- ability to reset the Expression Builder to the Graphical Builder when working in the Join or Filter panes
- ability to edit format and informat values directly in the Query step
- a default length is set when you create a character variable in the Expression Builder

For more information, see "Working with Queries" in *SAS Studio: User's Guide*.

Importing Data

The experience for importing data is now the same whether you are in a flow or on a tab in the workspace. You can now edit the metadata when you import Excel files.

You can now import data directly from your desktop. (You no longer have to first upload the file.) Read more

Working with SAS Viya Jobs

This release of SAS Studio improves the way you work with jobs. Read more

- The deploy, redeploy, and jobs functionality is determined by the authorization rules in SAS Environment Manager. You can now see all deployed and scheduled jobs that you can access by using the Submission and Job Status tab.
- In SAS Studio Analyst and SAS Studio Engineer, you can create your jobs by using the visual designer on the **Design** tab.
- In SAS Studio, you can now run a job definition that contains JSON prompts.
- If your job definition references an HTML form, SAS Studio automatically embeds the form with the job definition. You cannot create HTML forms in SAS Studio.

For more information, see SAS Studio Developer's Guide: Working with Jobs.

Viewing Scheduled SAS Jobs

In the Submissions and Job Status tab, the Scheduled Jobs subtab now shows the next time that a scheduled job will run. Read more

New Parameter for SAS Studio URL

To specify the default server context to use when starting SAS Studio, add the sas-studio-servername parameter to the URL. Read more

Submissions Subtab

The Submissions subtab of the Submissions and Job Status tab now displays run times as <hours>:<minutes>.<seconds>.<milliseconds>.

Accessibility

Enhancements to Flows

You can access some of the flow functionality using a keyboard or a screen reader. Read more

Refreshed SAS Viya Themes

The SAS Viya themes have been refreshed.

Here are the theme enhancements:

- improved focus indicator visibility for keyboard users
- an updated Dark theme, which provides a better low-light experience, reduces eye strain, and supports extended use
- an updated graph palette, which provides a new default color scheme for graphs
- an updated High Contrast theme, which makes reading and understanding complex graphs easier for users with visual impairments
- redesigned elements, such as buttons, input fields, and tiles, which provide a more consistent experience
- a new typeface with improved legibility, a refreshed color palette, and an updated illustration style

Snippets

Snippets are in a new format (.snippet file). A snippet now has a text format, so a snippet cannot be dragged into a flow. Read more

Automatic Ports on Nodes in Flows

SAS Studio automatically adds ports to a node as they are needed when you connect nodes. The number of ports available depends on the node. Read more

Exporting Data: Using Labels for Column Names

When exporting data, you can use the column labels instead of the column names as the column headers in the exported file. This option is not available for fixed-width files. Read more

Deprecated: Substitute Spaces for Tabs in Code Editor

Starting in this release, the **Substitute Spaces for Tabs** option is no longer available. By default, the tab size is `4` spaces.

LTS 2025.03 (May 2025)

New Welcome to SAS Viya Page

On the new Welcome to SAS Viya page, you can access demos, learn more about SAS Viya platform applications, and change your global settings. By default, this page appears when you sign in to a SAS Viya platform application. If you have used the "Initial view" global setting to specify what you want to open at start-up, that setting is honored and the Welcome to SAS Viya page does not appear. Read more

Transforming Data

Recode Values Step

The Recode Values step enables you to change the values of character and numeric variables. With this step, you can specify single values to be recoded as other values of the same type. The Recode Values step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Recode Ranges Step

The Recode Ranges step enables you to specify a range of numeric values and change all of the values in the range to another value. For example, you could replace test scores from 90 to 100 with a letter grade of "A," scores from 80 to 89 with a letter grade of "B," and so on. The Recode Ranges step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Generating Statistics

ANOVA Statistical Power Step

The ANOVA Statistical Power step calculates power and sample size analyses for one degree of freedom contrasts and the overall F test. The ANOVA Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Confidence Intervals Statistical Power Step

The Confidence Intervals Statistical Power step calculates the power or sample size for these confidence intervals: one-sample means, paired means, two-sample means, and one proportion. The Confidence Intervals Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Cox Regression Statistical Power Step

The Cox Regression Statistical Power step calculates the power or sample size for the score test. This test is for a single scalar predictor in Cox proportional hazards regression for survival data. The Cox Regression Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Custom Tests Statistical Power Step

The Custom Tests Statistical Power step calculates power or sample size for test statistics from the chi-square, Pearson correlation, normal, F, and t distributions.

The Custom Tests Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Discriminant Analysis Step

For a set of observations with one or more quantitative variables and a classification variable, the Discriminant Analysis step develops a discriminant criterion to classify each observation into a group. The derived discriminant criterion from this data set can be applied to a second data set during the same run. The Discriminant Analysis step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Hierarchical Clustering Step

The Hierarchical Clustering step enables you to perform hierarchical cluster analysis. The Hierarchical Clustering step can be used with either coordinate data or distance data. The Hierarchical Clustering step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

K-Means Clustering Step

The K-Means Clustering step enables you to cluster interval or ratio data using the k-means algorithm. This step is a good starting point for cluster analysis. The K-Means Clustering step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Logistic Regression Step

The Logistic Regression step fits predictive models by using logistic regression of a binary response and automated model selection and validation. The Logistic Regression step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Logistic Regression Statistical Power Step

The Logistic Regression Statistical Power step calculates power and sample size analyses for the likelihood ratio chi-square test of a single predictor in binary logistic regression. This calculation possibly occurs in the presence of one or more covariates that might be correlated with the tested predictor. The Logistic Regression Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Nonparametric Survival Analysis Step

The Nonparametric Survival Analysis step computes nonparametric estimates of the survival distribution function and compares survival functions of two or more groups. The Nonparametric Survival Analysis step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Partial Least Squares Regression Step

The Partial Least Squares Regression step performs partial least squares analysis. It also performs principal components regression and reduced rank regression. These techniques combine dimension reduction of the predictors and dependent variables with predictive modeling. The Partial Least Squares Regression step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Predictive Regression Models Step

The step is predictive in that it selects the most influential effects based on observed data. This step enables you to logically partition your data into disjoint subsets for model training, validation, and testing. The Predictive Regression Models step focuses on the standard independently and identically distributed general linear model for univariate responses and offers great flexibility and insight into the model selection algorithm. The Predictive Regression Models step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Quantile Regression Step

The Quantile Regression step fits predictive models by using quantile regression with automated model selection. The Quantile Regression step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Survival Rank Tests Step

The Survival Rank Tests step calculates power, sample size, or number of events for two-sample survival rank tests. The Survival Rank Tests step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

t Tests Statistical Power Step

The t Tests Statistical Power step calculates the power or sample size for t tests of means and mean ratios. The t Tests Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Tests of Proportions Statistical Power Step

Power and sample size analysis optimizes the resource usage and design of a study, which improves the chances of conclusive results with maximum efficiency. The Tests of Proportions Statistical Power step calculates the power or sample size for tests of one proportion, two correlated proportions, and two independent proportions. The Tests of Proportions Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Wilcoxon Test Statistical Power Step

The Wilcoxon Statistical Power step calculates power and sample size analyses for the Wilcoxon-Mann-Whitney test for two independent groups. The Wilcoxon Test Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Working with Econometrics

Aggregate Loss Models Step

The Aggregate Loss Models step computes an estimate of the probability distribution model of the aggregate loss. This estimate is based on the knowledge of the distribution of loss severity and loss count. The Aggregate Loss Models step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Panel Data Models Step

The Panel Data Models step enables you to run analyses for a variety of model types. You can analyze a class of linear econometric models that commonly arise when time series and cross-sectional data is combined. This type of pooled data on

time series cross-sectional bases is often referred to as panel data. This step also handles cross-sectional data (data without the time ID values). The Panel Data Models step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Severity Models Step

The Severity Models step estimates parameters of any arbitrary continuous probability distribution that is used to model the magnitude (severity) of a continuous-valued event of interest. The Severity Models step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Spatial Regression Models Step

The Spatial Regression Models step analyzes a class of linear spatial econometric models for cross-sectional data whose observations are spatially referenced or georeferenced. The Spatial Regression Models step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Preparing Data

Label Encoding Step

The Label Encoding step converts low cardinality categorical variables into a sparse label-encoded representation. The Label Encoding step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Partition Data Step

The Partition Data step enables you to create up to four partitions that are created by randomly sampling the input data. Partitions can be used to develop a model. In this case, you want to train the model on part of the data and reserve some of the data for testing. Using the Partition Data step, you can save all the partitions to one output data set or save each partition in a separate table. The Partition Data step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Standardize Data Step

If you are running the Standardize Data step using the SAS CAS Server, you can center and scale values so that different features are equally weighted. The Standardize Data step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Unique Identifier Step

The Unique Identifier step returns a Universally Unique Identifier (UUID) as a string of 36 hexadecimal characters and hyphens or a binary value of 16 bytes. The Unique Identifier step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Variable Selection Step

The Variable Selection step enables you to perform unsupervised and supervised variable selection. The task identifies a set of variables that explain the maximum amount of data variance that is contained in the target variable or the data source. The Variable Selection step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Machine Learning

Gradient Boosting Step

The Gradient Boosting step produces an ensemble of tree-based statistical models called decision trees for interval or nominal targets. It uses the gradient boosting approach. The Gradient Boosting step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Market Basket Analysis Step

The Market Basket Analysis step performs association rule mining on a transaction data set. The Market Basket Analysis step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

End of Life: SAS Tasks

The task functionality reaches end of life in the 2024.12 stable release and in the LTS 2025.03 release. SAS recommends users convert any existing tasks to custom steps as soon as possible. Read more

SAS Drive Is Now Deprecated

The SAS Drive application is deprecated and disabled by default, starting in the 2024.12 (December 2024) release. The functionality of SAS Drive is now available on the Content page in SAS Environment Manager, and administrators can re-enable SAS Drive until its official retirement in the 2025.12 release. Read more

Changes from Previous Releases

The root URL for the SAS Viya platform now routes users to `https://prod.example.com/SASLanding/` by default. Previously, the root URL was routed to `https://prod.example.com/SASDrive/` by default.

Displaying Detailed Status Messages in the Submission Status Window

You can use the new Display detailed status information in the Submission Status option to display the status messages that are generated as your SAS programs run. Read more

LTS 2024.09 (November 2024)

Enriching Data

Verify with Loqate Step

The Verify with Loqate step enables you to verify addresses, emails, and phone numbers that use the Loqate Verify API. This step replaces three previous steps: Verify & Geocode Addresses - Loqate, Verify Email Addresses - Loqate, and Verify Phone Numbers - Loqate. Read more

Examining Your Data

Explore Data Step

The Explore Data step provides graphs that can be used to explore the relationships among selected variables. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Integrating Data

Lookup Step

The Lookup step enables you to add information to your data by looking up data values in reference, or lookup, tables. You can add the lookup data, along with data from a source table, to a target table. The Lookup step also provides a means of protecting your data quality by enabling you to define actions, such as writing data to an exception table, when there is no match in a lookup table for data in the source table. The Lookup step is available only if your site licenses SAS Studio Engineer. Read more

Generating Statistics

Analysis of Covariance Step

The Analysis of Covariance step fits a linear model that combines the continuous and categorical predictors of a continuous dependent variable. This step also produces graphical output to interpret the results. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Decision Tree Step

The Decision Tree step produces tree-based statistical models called decision trees for nominal and interval targets. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Equivalence Tests Statistical Power Step

The Equivalence Tests Statistical Power step performs power analysis and sample size determination for equivalence tests of one-sample mean, paired means, two-sample means, and one proportion. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Estimate Within-Cluster Covariances Step

The Estimate Within-Cluster Covariances step uses the Art, Gnanadesikan, and Kettenring method to estimate within-cluster covariances. This approach might result in more spherical clusters when the resulting canonical variables are clustered. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Linear Regression Step

Using the Linear Regression step, you can perform linear regression analysis on multiple dependent and independent variables. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Multiple Regression Statistical Power Step

Power and sample size analysis optimizes the resource usage and design of a study, which improves the chances of conclusive results with maximum efficiency. The Multiple Regression Statistical Power step calculates the power or sample size for multiple regression. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Nonparametric One-Way ANOVA Step

The Nonparametric One-Way ANOVA step consists of nonparametric tests for location and scale differences across a one-way classification. The step also provides a standard analysis of variance on the raw data and statistics based on the empirical distribution function. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

One-Way ANOVA Step

The One-Way ANOVA step tests and provides graphs for differences among the means of a single categorical variable on a single continuous dependent variable. The One-Way ANOVA step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Summary and Level Statistics Step

The Summary and Level Statistics step computes level and descriptive statistics for variables in a data source. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Summary Tables Step

The Summary Tables step displays descriptive statistics in tabular format, using some or all of the variables in a data set. You can create a variety of tables, ranging from simple to highly customized. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Working with Econometrics

Hidden Markov Models Step

The Hidden Markov Models step analyzes the time series or panel data by using a statistical Markov model to infer hidden states through a Markov process. The Hidden Markov Models step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Managing Models

Assess Model Step

The Assess Model step evaluates the performance of a predictive model by comparing the predicted and actual target values in a scored data set. Based on the type of target, performance measures such as ROC, lift, and fit statistics are available. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Preparing Data

Imputation Step

The Imputation step replaces missing values in a data source with an estimate of the missing value. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Standardize Data Step

The Standardize Data step enables you to center or standardize one or more numeric variables by using a variety of methods. The Standardize Data step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Transform Columns Step

The Transform Columns step enables you to transform one or more variables in the input data set. These transformed variables are saved to an output data set. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Working with Machine Learning

Automated Feature Engineering Step

The Automated Feature Engineering step explores the variables in the input data and automatically performs feature engineering in a parallel, scalable way. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Bayesian Network Step

The Bayesian Network step trains a predictive model of a nominal target by using different types of Bayesian network structures, including parent-child Bayesian network (default), Markov blanket, naive Bayesian network, or tree-augmented naive Bayesian network. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Factorization Machine Step

The Factorization Machine step combines the advantages of smart machine vision (SMV) with factorization models. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Forest Step

The Forest step produces an ensemble of tree-based statistical models called decision trees for interval or nominal targets. It uses the Random Forest approach. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Robust Principal Component Analysis Step

Robust Principal component analysis is a multivariate technique for examining relationships among several quantitative variables. Use principal component analysis if you are interested in summarizing data and detecting linear relationships. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Semi-supervised Learning Step

The Semi-supervised Learning step iteratively propagates the labels from the labeled data to the unlabeled data by computing the similarity measure between pairs of data. The Semi-supervised Learning step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Support Vector Data Description Step

The Support Vector Data Description step is a one-class classification machine learning technique. The Support Vector Data Description step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Support Vector Machine Step

The Support Vector Machine step performs classification analysis for binary targets by using a support vector machine, which is a supervised machine learning method. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Optimization and Network Analysis

Biconnected Components Step

A biconnected component of an undirected graph is a connected subgraph that cannot be broken into disconnected pieces by deleting any single node (and its incident links). The Biconnected Components step finds all biconnected components of such a graph. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Centrality Metrics Step

The Centrality Metrics step calculates several types of centrality metrics that indicate the relative importance of a node or link within a graph. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Community Detection Step

The Community Detection step partitions a graph into communities such that the nodes within the community subgraphs are more densely connected than the nodes from different communities. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Connected Components Step

The Connected Components step finds all the connected components in a graph. A connected component in a graph is a set of nodes that have a path between them. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Cycle Detection Step

The Cycle Detection step finds the elementary cycles of an input graph. An elementary cycle is a path in which the start node and the end node are the same, and no node appears more than once in the sequence. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Linear Assignment Step

The Linear Assignment step assigns any objects from one group to objects in a second group at minimal cost. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Maximal Cliques Step

The Maximal Cliques step finds the maximal cliques of a graph. A clique is an induced subgraph such that every node in that subgraph is connected to every

other node. A maximal clique is a clique that is not a subset of the nodes of any larger clique. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Minimum Cost Network Flow Step

The Minimum Cost Network Flow step is a fundamental problem in network analysis that involves sending flow over a network at minimal cost. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Minimum Cut Step

The Minimum Cut step finds a minimum cut of an undirected graph that has the smallest link metric. A cut is a partition of the nodes of a graph into two disjoint subsets. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Minimum Spanning Tree Step

A spanning tree of a connected undirected graph is a subgraph. This subgraph is a tree that connects all the nodes. The Minimum Spanning Tree (MST) step finds the spanning tree, among all possible spanning trees, that has the minimum link cost. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Network Summary Step

The Network Summary step calculates various summary statistics for a graph and its nodes. The Network Summary step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Reach Network Step

The Reach Network step calculates the reach (ego) network of a graph. In the context of social networks, reach networks are often referred to as ego networks, because they focus on the neighbors of one particular individual (or more than one). This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Shortest Paths Step

The Shortest Paths step calculates paths between sets of nodes in the input graph with the lowest total link weight. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Transitive Closure Step

The Transitive Closure step calculates the transitive closure of a graph. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Traveling Salesman Problem Step

The Traveling Salesman Problem (TSP) finds a minimum-cost tour in a graph. A tour of a graph is a sequence of nodes where the start node and end node are the same, and every node in the graph is visited exactly once. In solving the TSP, the goal is to find a tour that minimizes the costs of the links. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Controlling the Statistical Process

Capability Analysis Step

The Capability Analysis step compares the distribution of a process to its specification limits. The Capability Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Visualizing Data

Mosaic Plot Step

Mosaic plots display tiles that correspond to the crosstabulation table cells. The areas of the tiles are proportional to the frequencies of the table cells. The column variable is displayed on the X axis, and the tile widths are proportional to the

relative frequencies of the column variable levels. The row variable is displayed on the Y axis, and the tile heights are proportional to the relative frequencies of the row levels within column levels. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Analyzing Text

Segmentation Step

The Segmentation step segments text data using k-means clustering. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Text Parsing and Topic Discovery Step

The Text Parsing and Topic Discovery step is used to parse documents into a term-by-document matrix and extract topics from the term-by-document matrix. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Text Scoring Step

The Text Scoring step scores a data table by using tables that are generated by another Text Analytics step. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Text Summarization Step

The Text Summarization step generates textual summaries of text data. The Text Summarization step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Custom Steps: Enhancements to the Column Selector Control

When creating a custom step, you can specify whether the values for the column selector control come from an input table or from another column selector control. Read more

Custom Steps: Option Table Control

Use the option table control to create a repeatable group of controls that is displayed in the user interface as a table. Read more

Flow Macro Variables

SAS Studio now generates these macro variables when you run a flow:

- FLOW_ID contains the flow ID for a flow that is saved in a SAS Content location. This variable value is populated only if the flow has been saved.
- FLOW_NAME contains the name of the flow.

You can use these macro variables in other steps in the flow in which you write your own SAS code, including the SAS Program step and custom steps.

To view the macro variables, click the **Generated Code** tab, and then expand the "Generated flow setup" region.

Specifying Which Row in a File Contains Column Names

A new option for File nodes enables you to specify which row in a file is the header row. This option does not apply to Microsoft Excel files. Read more

Running a Portion of a Program in a Flow

You can select a block of code to run in a SAS or Python program in a flow. Read more

Query Step: Added Support for Explicit Pass-Through

If you are creating a query in a flow, you can now use explicit pass-through for queries that contain only SingleStore or only Snowflake tables. Read more

Copying the Full Path of a File or Folder to the Clipboard

You can now copy the full path of a file or folder to the clipboard from the Explorer pane. Read more

Git Profiles: Support for HTTPS Authentication and Password-Protected SSH Keys

When you are creating a Git profile, you can now configure SAS Studio to store and access HTTPS authentication criteria and password-protected SSH keys by using the SAS Environment Manager credential service. Read more

LTS 2024.03 (May 2024)

Important Change: System Options in SAS Studio

SAS Studio automatically sets several system options before each code submission. The list of system options on the SAS Viya 4 platform is different from the list in SAS 9.4 and SAS Viya 3.5. Read more

Integrating Data

Load Table Step with SingleStore Data

If both the source and target tables are located in a SingleStore database, you can now use native SQL code for the Upsert rows technique. This option can improve performance. Read more

Examining Data

Characterize Data Step

The Characterize Data step creates a summary report of tables and graphs that describe the variables in the input data set. This step can also create frequency and univariate output tables that describe the main characteristics of the data.The Characterize Data step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Describe Missing Data Step

The Describe Missing Data step displays the frequencies and percentages of missing values for each selected variable. If two or more variables are assigned to this step, the step displays the pattern of missing data across variables. The Describe Missing Data step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Visualizing Data

Bubble Map Step

The Bubble Map step creates a map that is overlaid with a bubble plot. The Bubble Map step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Bubble Plot Step

The Bubble Plot step explores the relationship between three or more variables. In a bubble plot, two variables determine the location of the bubble centers, and a third variable specifies the size of each bubble. A fourth variable can be used to determine the colors of the bubbles. The Bubble Plot step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Choropleth Map Step

The Choropleth Map step creates a map of polygonal areas. The Choropleth Map step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Heat Map Step

The Heat Map step displays the magnitude of the response based on two variables. The response is represented as a color value from a color gradient. The Heat Map step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Histogram Step

The Histogram step creates a chart that displays the frequency distribution of a numeric variable. The Histogram step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Pie Chart Step

The Pie Chart step creates pie charts that represent the relative contribution of the parts to the whole by displaying data as wedge-shaped "slices" of a circle. Each slice represents a category of data. The size of a slice represents the contribution of the data to the total chart statistic. The Pie Chart step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Scatter Map Step

The Scatter Map step creates a map that is overlaid with a scatter plot. The Scatter Map step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Series Map Step

The Series Map step creates a map overlaid with a series plot. The Series Map step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Series Plot Step

The Series Plot step creates plots that display a series of line segments that connect observations of input data. The Series Plot step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Text Map Step

The Text Map step creates a map that is overlaid with a text scatter plot. The Text Map step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Generating Statistics

Canonical Correlation Step

The Canonical Correlation step performs canonical correlation, partial canonical correlation, and canonical redundancy analysis. The Canonical Correlation step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Cluster Variables Step

The Cluster Variables step finds clusters of variables to use in additional clustering or to select non-redundant variables in further clustering. The Cluster Variables step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Coin Toss Simulation Step

The Coin Toss Simulation task simulates the tossing of a specified number of coins. The results show the frequency and percentage of occurrences that the coin

displays heads given a specified number of tosses. The Coin Toss Simulation step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Combinations Step

The Combinations step computes the possible combinations of the total number of objects into sets with a specified number in each set. The Combinations step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Compute Similarities and Distances Step

The Compute Similarities and Distances step computes various measures of distance, dissimilarity, or similarity between observations in an input table. This information can be used in hierarchical cluster analysis and in multidimensional scaling. The Compute Similarities and Distances step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Correlation Analysis Step

Correlation is a statistical procedure for describing the relationship between numeric variables. The relationship is described by calculating correlation coefficients for the variables. The correlations range from –1 to 1. The Correlation Analysis step provides graphs and statistics for investigating associations among variables. The Correlation Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Correspondence Analysis Step

The Correspondence Analysis step performs simple or multiple correspondence analysis of qualitative data. You can specify either raw data or table data for the input data source. The Correspondence Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Dice Roll Simulation Step

The Dice Roll Simulation step simulates rolling a specified number of dice. The results show the frequency and percentage of each possible roll given a specified number of throws. The Dice Roll Simulation step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Factor Analysis Step

The Factor Analysis step performs a factor analysis with a variety of available methods and rotations. The Factor Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Multidimensional Preference Analysis Step

The Multidimensional Preference Analysis step performs a principal components analysis of rank-ordered data. The principal result is a plot of the scores. These scores are the objects that are being rated. In the plot, the scores are represented as points, and the structure (raters) are represented as vectors. The Multidimensional Preference Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Permutations Step

The Permutations step computes the possible permutations of a given number of objects. The Permutations step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Poker Hand Probability Step

The Poker Hand Probability step calculates the frequency and probability of poker hands. The Poker Hand Probability step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Same Birthday Probability Step

The Same Birthday Probability step computes the probability that two or more people in a room have the same birthday. The Same Birthday Probability step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

t Tests Step

The t Tests step enables you to perform a one-sample test, a paired test, or a two-sample test. The t Tests step is available in SAS Studio Analyst or SAS Studio Engineer. Read more

Preparing Data

Binning Step

The Binning step divides the data values of a continuous variable into intervals. The values for each interval are replaced with a single value that is representative of the interval. The Binning step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Transforming Data

Manage Columns Step

Support for Creating Columns and Changing Column Properties

You can now create a column in the output table when you run the Manage Columns step. You can also update the name, label, data type, length, format, and informat of a column in the output table. Read more

Creating a Data View from the Output Port

You now have the option to create a data view instead of a physical table from the output port of a Manage Columns node. Read more

Remove Duplicates Step

You can now specify whether to write duplicate rows to the log or save duplicate rows to a table. Read more

Stack Columns Step

By default, no case identifier is created by the step. You must specify whether to create a case identifier variable, or you can select identifier variables from the input table. The Stack Columns step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Enhancing Data Quality

Clean Data Step

The Clean Data step performs Standardization, Casing, Identification Analysis, Gender Analysis, and Pattern Analysis by using the QKB locale. The Clean Data step is available in SAS Studio Engineer. Read more

Licensing Change: Match Codes Step

The Match Codes step has been updated and is no longer available in SAS Studio Analyst. The Match Codes step is now available only in SAS Studio Engineer. If you added a Match Codes step to a flow when using SAS Studio Analyst, you must remove the deprecated step from the flow. Then you can use SAS Studio Engineer to add the Match Codes step back to the flow. Read more

Parse Data Step

The Parse Data step performs Parsing and Extraction by using the QKB locale. The Parse Data step is available in SAS Studio Engineer. Read more

Managing Models

Register Python Model Step

Using this step, you can register into SAS Model Manager your Python models that have been trained in SAS Studio. Then you can use the functionality in SAS Model Manager to manage and govern your trained models.This step is available only for classification models with a binary target. The Register Python Model step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Working with Econometrics

Causal Models Step

The Causal Models step uses the two-stage least squares method and the Heckman's two-step selection method. The Causal Models step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Working with Machine Learning

Fast k-Nearest Neighbors Step

The Fast k-Nearest Neighbors step searches for the k-nearest neighbors (KNN) of the specified data. The Fast k-Nearest Neighbors step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Moving Window Principal Component Analysis Step

The Moving Window Principal Component Analysis step can be used to assess how principal components change over time. The Moving Window Principal Component Analysis step is available in SAS Studio Analyst or SAS Studio Engineer. Read more

Controlling the Statistical Process

Analysis of Means Step

Analysis of means is a method for simultaneously comparing treatment means with their overall mean. The Analysis of Means step is available in SAS Studio Analyst or SAS Studio Engineer. Read more

Control Charts Step

The Control Charts step creates Shewhart control charts for deciding whether a process is in a state of statistical control. The Control Charts step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Pareto Analysis Step

Pareto charts display the frequencies of quality-related problems in a process. The frequencies are represented by bars that are ordered in decreasing magnitude. Thus, you can use a Pareto chart to decide which subset of problems to solve first or which problem areas deserve the most attention. The Pareto Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Optimization and Network Analysis

Core Decomposition Step

The Core Decomposition step decomposes a graph into cohesive subgroups. The Core Decomposition step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Implement SCD Step with SingleStore Data

Support for Generating Surrogate Keys

If you are using SingleStore data, you can now use a surrogate key that is generated elsewhere, or you can generate the surrogate key in SAS Studio. Read more

Optional Flagging Method

The flagging method, which is used to identify the current row, is now optional if you are using SingleStore data. Read more

Custom Steps: Link Control

Use the Link control to add hyperlinks to your custom steps. For security reasons, this feature must be enabled by your SAS administrator in SAS Environment Manager. Read more

Library for Temporary Output Files in Flows

You can use the new Default output library for intermediate tables option to change the default library for temporary output files in all flows or for a single flow. Read more

New Git Functions

Use the new GIT_REF_LIST, GIT_REF_GET, and GIT_REF_FREE functions to list all references in a local Git repository and either display the information in the SAS log or create an in-memory data structure.

- GIT_REF_LIST returns the list of reference objects that are associated with the local repository.
- GIT_REF_GET returns the specified attribute of a reference object in the local repository.
- GIT_REF_FREE clears the reference objects that are associated with the local repository.

New Data Quality Snippets

There are several new Data Quality Snippets: Match Action Clustering, OPTNET Clustering, RTENG Clustering, and Survivorship. Read more

- The Match Action Clustering snippet uses the Entity Resolution action set (`entityres.match`) to cluster data based on fuzzy matching. The output table contains the input columns and a cluster ID column that contains the cluster number.
- The OPTNET Clustering snippet uses the DQCLNET macro to cluster matching records based on the specified match rules. Multiple match rules represent OR matching conditions. Multiple columns within a match rule represent AND matching conditions.

- The RTENG Clustering snippet uses the DQCLRTNG macro to cluster data based on fuzzy matching. The macro uses the RTENG action set to perform exact matching and clustering. The output table contains the input columns and a cluster ID column that contains the cluster number.
- The Survivorship snippet uses the DQSUVR macro to identify a surviving record from a group of records in a cluster. The output also shows different methods to compose and indicate the surviving record.

Adding Subflows to a Flow

You can now add subflows to your flow from a SAS server location. Read more

Converting SAS Tasks to SAS Custom Steps

The task functionality will reach end-of-life in the 2024.12 stable release and in the LTS 2025.03 release. SAS recommends users convert any existing tasks to custom steps as soon as possible. Read more

Starting with the 2024.07 stable release and the LTS 2024.09 release of SAS Studio, the **Tasks** pane will not be available from the SAS Studio workspace by default. To access the **Tasks** pane, select **View** ⇨ **Navigation panes** ⇨ **Tasks**.

Indenting Options and Sections in Custom Steps

When authoring a custom step, you can use the Indent option (which is available for all controls and sections) to specify whether to indent an option, text, or section in the user interface. Using indention enables you to visually show a hierarchy of sections, options, and text. It also enables to you to group options under a section heading. Read more

Date Modified in Redeployed SAS Viya Jobs

When you upgrade from LTS 2023.10 to LTS 2024.03, the Date Modified field for a SAS job is not updated after the SAS job is redeployed in 2024.03.

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Stable Releases

2026.04 (April 2026)

R Code Editor

SAS Studio includes a color-coded editor for editing new or existing R programs (*.r). With the R code editor, you can write, run, and save R programs without explicitly using PROC R. Many of the features that are available for SAS programs are also available for R programs, including the ability to schedule an R program and run an R program as a job or a background submission. You can also add an R program to a flow by using the R Program step. Read more

Standalone Steps: Preview the SAS Code

When working with a standalone step, the Code Preview window now shows the SAS code that is used in the step. You can use this code to build your own SAS code for any custom steps that you need to create. Read more

SAS Steps: List Data

You can now specify a custom title and footnote for the output. Read more

Treating NULL Values as Equal in the Implement SCD, Lookup, and Merge Table Steps

You can now choose whether NULL values are treated as equal when you are matching key columns or source and target columns in the Implement SCD, Lookup, and Merge Table steps. The options to specify how NULL values are treated are available in the Configuration section of the Node tab for each step.

Importing SAS Enterprise Guide Code Snippets

You can now upload SAS Enterprise Guide code snippet files (*.kmf) into SAS Studio and convert them to SAS Studio snippets. You must first export the code snippets from SAS Enterprise Guide, and then upload the snippets to your My Snippets folder in SAS Studio. Read more

2026.03 (March 2026)

Working with Parameters

Parameters enable you to request input from the user when code is run. Including parameters in your code increases your ability to reuse code and also enables the code to be customized using the value that you enter for the prompt. Read more

Adding Preamble and Postamble Code to a Flow Node

You can add custom SAS code to run before and after a node in a flow by using the Node tab in the node details. Read more

Custom Steps: Library Selector Control

You can now link an option table control to a column selector control so that the column selector defines the number of rows in the option table. Read more

2026.02 (February 2026)

Display Location for Recents and Favorites Items on Start Page Tab

The location and path name are now displayed for items in the Recents and Favorites lists on the Start Page tab. Read more

Updates to Flow Node Details

The Node tab of the node details now includes a navigation pane with categories to make the options easier to find.

Running a Region of a Program

When you run a program, you can select multiple collapsed or expanded regions to run. If you select a portion of a region, the entire region is run. Read more

Custom Steps: Option Table Control

You can now link an option table control to a column selector control, so the column selector defines the number of rows in the option table. Read more

2026.01 (January 2026)

DATA Step Debugger

The DATA Step Debugger is a tool that enables you to find logic errors in a DATA step program. With the DATA Step Debugger, you can watch the variable values in a program change as the program runs. You can execute the program line by line, and you can set specific breakpoints in the program. Read more

Updates to the Folders and Files Selector

The window that is used to select folders and files when you open, save, or export files has been updated to provide the ability to add a new folder and to persist expanded folders in both SAS Content and SAS Server locations. The performance of the window has also been improved.

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Limited Support

2025.12 (December 2025)

Excluding a Node from Running in a Flow

You can exclude one or more nodes from running in a flow. This option enables you to test portions of a flow without running or redesigning the entire flow. Read more

Query Updates

Disconnecting Data Sources from a Query Node in a Flow

If you disconnect a data source from the Query node, any join conditions become unresolved until you connect a new data source. Read more

Resetting a Join

You can reset the join to the default settings by clicking Reset join on the toolbar of the Join tab. Read more

2025.11 (November 2025)

Critical Change: Git Profiles Using SSH Authentication

Due to recent third-party updates, you must include a known_hosts file in the <userhome>/.ssh directory along with your public and private SSH key files. If this file is not found, you receive an error stating that SSH authentication failed because the specified URL or public SSH key is invalid for the remote repository. Read more

Examining Data

Compare Data Step

The Compare Data step compares variables from two data sets or compares two variables in the same data set. This step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Displaying Errors and Warnings on the Code Tab for SAS Programs

The new Display errors and warnings in code option highlights errors and warnings on the Code tab after you run a SAS program. Read more

Cloning Git Repositories: SAS Studio Automatically Creates a Folder

When you clone a Git repository, SAS Studio automatically creates a folder for the repository. By default, the repository name is used as the folder name. Read more

Searching and Filtering in the Table Node

You can filter columns by character or numeric data types on the Published Columns tab of a table node. You can also enter search criteria for the Name and Label columns. Read more

2025.10 (October 2025)

Flow Macro Variables

SAS Studio now generates the FLOW_PLACE and FLOW_LOCATION macro variables when you run a flow. Read more

- FLOW_LOCATION is the full path to the saved location of the flow.
- FLOW_PLACE is the location where the flow is saved: SAS Content or SAS Server.

New Code Editor Settings for Editing

- With the **Insert spaces when pressing the Tab key** option, you can insert the number of spaces that are specified in the **Tab size** setting instead of a tab character.
- The **Detect and apply the indention style used in the file** option automatically detects how the lines of code in the file are indented and then changes the current indention settings to match the style that is being used. The detected settings override any other indention settings that you have specified while you are editing the current file. For example, if this option is selected and the default tab size is four, but the file uses two spaces for a tab, then the editor switches to using two spaces for tabs in the current file. If an indention style is not detected, the other indention settings apply. This setting is selected by default. .

For more information, see "Specifying Code Editor Editing Settings" in *SAS Studio: User's Guide*.

2025.09 (September 2025)

Performing Impact Analysis

You can use impact analysis to help identify the potential consequences of making a change to a table or column. You can run an impact analysis on a table and then select columns from the table to analyze as well. Read more

You can run two types of impact analysis:

- Forward impact analysis enables you to identify any tables, columns, flows, or steps that are affected by a change to a selected table or column.
- Reverse impact analysis traces the sources that contribute to the content of a selected table or column.

Adding Status Handling to a Flow

You can use the status handling feature to send the flow status to a specified table after the flow is finished running. Read more

Steps: Filter for Input Table Control

For a standalone custom step, you can allow the step user to filter the rows in the input table. Filtering is not available when running a step in a flow. Read more

Adding Snippets to a Flow as Embedded Programs

You can add snippets to the flow from the Snippets section of the navigation pane. Snippets are added to the flow as embedded programs. Read more

Using Undo and Redo in a Flow

You can undo and redo actions that affect the flow canvas, including adding and deleting nodes, ports, connections, and swimlanes. You can also undo and redo any manual or automatic reordering of nodes in the flow. Read more

Viewing Scheduled SAS Jobs

In the Submissions and Job Status tab, the Scheduled Jobs subtab now shows the next time that a scheduled job will run. Read more

2025.08 (August 2025)

Automatic Ports on Nodes in Flows

SAS Studio automatically adds ports to a node as they are needed when you connect nodes. The number of ports available depends on the node. Read more

Exporting Data: Using Labels for Column Names

When exporting data, you can use the column labels instead of the column names as the column headers in the exported file. This option is not available for fixed-width files. Read more

2025.07 (July 2025)

New Parameter for SAS Studio URL

To specify the default server context to use when starting SAS Studio, add the sas-studio-servername parameter to the URL. Read more

Submissions Subtab

The Submissions subtab of the Submissions and Job Status tab now displays run times as <hours>:<minutes>:<seconds>.<milliseconds>.

2025.06 (June 2025)

New User Interface

The June release of SAS Studio contains a new front-end framework. This new interface includes significant performance improvements. All content (for example, flows, programs, and custom steps) that was developed in previous releases of SAS Studio on the SAS Viya 4 platform works in this new interface and does not require migration. In addition to the new user interface, SAS Studio includes many new features and enhancements.

IMPORTANT After you open a flow in the React version of SAS Studio, you cannot open this flow in a previous OpenUI5 release of SAS Studio.

Deprecated Features

These features are no longer supported and are not available starting in the 2025.06 (June) release of SAS Studio: interactive perspective, application command line, and the Console pane. Most of the functionality from the Console pane is now available in the Submission and Job Status window.

End of Life: SAS Tasks

The task functionality reached end of life in the 2024.12 stable release and in the LTS 2025.03 release. SAS recommends users convert any existing tasks to custom steps as soon as possible. Read more

Features for an Upcoming Release

Several features (that were available in previous releases of SAS Studio) will be added in a future release.

- DATA Step Debugger
- search bar
- in the File and Folder selector, the ability to create a folder on a SAS server
- undo and redo for flows
- in a step in a flow, the ability to filter by column type in the column structure (or published columns) view
- displaying the error and warning icons on the **Code** tab
- the ability to navigate to offscreen tabs in an overflow menu
- in the Submission and job status pane, the **Next Run Time** field
- in the Favorites and Recents views, displaying the location of an item
- in the Query step, the automatic creation of a port when you try to connect to a node that has no empty ports

Working with Flows

The flow functionality includes several new features. Read more

- Flows now use curved arrows.

- When no step is selected in the flow, the Details pane is hidden.
- Some steps can be opened on a new tab and used outside of a flow. The availability of a step depends on your SAS Studio license. For more information, see "Summary of Custom Steps Functionality" in *SAS Studio: User's Guide*.
- The step categories can be sorted alphabetically. You can also choose to hide selected categories.
- A Code Generation option is now available from the toolbar.
- After you run a flow, you can view the automatically generated code using the Preview code option.
- When importing a file in a flow, you are no longer required to first add a File node to the flow. You can expand the input and outport ports of the new step to see the file representation. For more information, see "Importing Data from an External File" in *SAS Studio: Working with Flows*.
- You can now display the output ports for the Load Table, Merge Table, and Implement SCD. When you hover your pointer over the output port, you see the name of the output table.

Working with Steps

General Enhancements

In the custom steps interface, the controls and sections are rearranged for a better user experience. Also, the drag-and-drop functionality is improved. Finally, the Shared tab in the Steps pane is renamed Custom Steps.

Working with Machine Learning

Neural Network Step

The Neural Network step creates a multilayer perceptron neural network. You can create networks with up to 10 hidden layers. Read more

Generating Statistics

Mixed Models Step

The Mixed Models step fits a variety of mixed linear models to data and enables you to use these fitted models to make inferences about the data. A mixed linear model is a generalization of the standard linear model. The generalization is that the data is permitted to exhibit correlation and nonconstant variability. Therefore, the mixed linear model provides the flexibility to model the means of your data (as in the standard linear model) and also the variances and covariances. Read more

Proportional Hazards Regression Step

The Proportional Hazards Regression step fits proportional hazards regression models to survival data. These models include the widely used semi-parametric Cox regression model and its extensions, such as the shared frailty model and the Fine-Gray model. The step supports the analysis of data that might be left-censored, right-censored, or interval-censored. Read more

Working with Git

The user interface for the Manage Git Connections window is improved. Read more

General Application Improvements

With the redesign of SAS Studio, you can expect several application improvements. Read more

- The new SAS Server and SAS Content panes replace the Explorer pane. When you delete a folder in SAS Server or SAS Content, the deletion is recursive. For more information, see "Accessing SAS Server and SAS Content Locations" in *SAS Studio: User's Guide*.
- More properties are available for files and folders. A confirmation window appears when you move a file or folder.
- The Start page now includes a link to create a Python program and a link to the SAS Studio home page on sas.com.
- To set your preferences, click the Profile icon and select **Settings**. For more information, see "About Customizing SAS Studio" in *SAS Studio: User's Guide*.
- The column selector now displays both the column name and the column label.

- The new Submissions and Job Status tab replaces the Submission Status and the Deployed and Scheduled Jobs tabs. For more information, see "Using the Submissions and Job Status Tab" in *SAS Studio: User's Guide*.

Updates to the Libraries Pane

The Libraries pane contains several enhancements. Read more

- A new Connection Manager window is available. For more information, see "Working with Library Connections" in *SAS Studio: User's Guide*.
- The division between basic and advanced options is clearer.
- A search is now available in advanced options and in the libraries list.
- The split between connected libraries and saved definitions is clearer.

Programming Enhancements

For programmers, SAS Studio includes several key enhancements. Read more

- a faster code editor for SAS and Python programs.
- syntax suggestion in the Python code editor.
- improved syntax help menu for SAS programs.
- new Find and Replace functionality, which replaces regular expressions.
- a minimap for the code. For more information, see "About the SAS Code Editor" in *SAS Studio: User's Guide*.

Note: The new code editor uses a feature-rich, industry-proven, open source base editor and provides a significant number of new features and enhancements. The previous list provides just a few examples of this new functionality. The change in editors also means that you might see some changes in behavior from previous releases of SAS Studio.

Table Viewer

The Table Viewer includes these enhancements. Read more

- The Table Viewer is more compact.
- SAS Studio now provides infinite scrolling in the table.
- You can now copy and paste a range of cells.

- In a current view, you can autosize all of the columns.
- You can use the go-to-row functionality to quickly move to a row in the table.
- You can now display the column names and column labels at the same time.
- SAS Studio saves any quick filters that you create within the current session and across SAS Studio sessions.
- By default, a maximum of 5,000 columns is displayed when you open a table. Use the SAS Studio settings to change this value.
- You now have the option to view both the formatted and unformatted data values.

For more information, see "About the Table Viewer" in *SAS Studio: User's Guide*.

Working with Queries

The query functionality has been improved through these enhancements. Read more

- improved experience when working with date, time, and timestamp values in a filter
- ability to perform aggregations in the Selected Columns pane
- ability to reset the Expression Builder to the Graphical Builder when working in the Join or Filter panes
- ability to edit format and informat values directly in the Query step
- a default length is set when you create a character variable in the Expression Builder

For more information, see "Working with Queries" in *SAS Studio: User's Guide*.

Importing Data

The experience for importing data is now the same whether you are in a flow or on a tab in the workspace. You can now edit the metadata when you import Excel files. You can now import data directly from your desktop. (You no longer have to first upload the file.) Read more

Working with SAS Viya Jobs

This release of SAS Studio improves the way you work with jobs. Read more

- The deploy, redeploy, and jobs functionality is determined by the authorization rules in SAS Environment Manager. You can now see all deployed and scheduled jobs that you can access by using the Submission and Job Status tab.
- In SAS Studio Analyst and SAS Studio Engineer, you can create your jobs by using the visual designer on the **Design** tab.
- In SAS Studio, you can now run a job definition that contains JSON prompts.
- If your job definition references an HTML form, SAS Studio automatically embeds the form with the job definition. You cannot create HTML forms in SAS Studio.

For more information, see SAS Studio Developer's Guide: Working with Jobs.

Accessibility

Enhancements to Flows

You can access some of the flow functionality using a keyboard or a screen reader. Read more

Refreshed SAS Viya Themes

The SAS Viya themes have been refreshed.

Here are the theme enhancements:

- improved focus indicator visibility for keyboard users
- an updated Dark theme, which provides a better low-light experience, reduces eye strain, and supports extended use
- an updated graph palette, which provides a new default color scheme for graphs
- an updated High Contrast theme, which makes reading and understanding complex graphs easier for users with visual impairments
- redesigned elements, such as buttons, input fields, and tiles, which provide a more consistent experience
- a new typeface with improved legibility, a refreshed color palette, and an updated illustration style

Snippets

Snippets are in a new format (.snippet file). A snippet now has a text format, so a snippet cannot be dragged into a flow. Read more

Deprecated: Substitute Spaces for Tabs in Code Editor

Starting in this release, the Substitute Spaces for Tabs option is no longer available. By default, the tab size is 4 spaces. Read more

2025.05 (May 2025)

Generating Statistics

Generalized Linear Models Step

The Generalized Linear Models step provides model fitting and model building for generalized linear models. It fits models for standard distributions such as Normal, Poisson, and Tweedie in the exponential family. This step also fits multinomial models for ordinal and nominal responses. The step provides forward, backward, and stepwise selection methods. The Generalized Linear Models step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Econometrics

Cross-Sectional Data Models Step

The Cross-Sectional Data Models step applies econometric techniques to analyze cross-sectional data. The Cross-Sectional Data Models step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Univariate Time Series Analysis Step

The Univariate Time Series Analysis step analyzes a single time series in which the values are equally spaced. This task provides analysis for these model types: ARIMA (autoregressive integrated moving average), ARIMAX, unobserved components, and regression with autocorrelated and heteroscedastic errors. The Univariate Time Series Analysis step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Forecasting Data

Subsequence Anomaly Detection Step

The Subsequence Anomaly Detection step is a motif-based technique that finds anomaly subsequences in a specified input sequence. The Subsequence Anomaly Detection step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Preparing Data

Sample Data Step

The Sample Data step performs simple or stratified random sampling or oversampling of the input data source. The Sample Data step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

2025.04 (April 2025)

Statistics

N-Way ANOVA Step

The N-way ANOVA step tests and provides graphs for effects of one or more factors on the means of a single, continuous dependent variable. The N-way ANOVA step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Enrichment

Verify with Loqate Step

You can now choose your external endpoint. Select the Do not use the Loqate external point option if you want to point to a local container for verifying addresses instead of using the Loqate service. The Verify with Loqate step is available if your site licenses SAS Studio Basic, SAS Studio Analyst, or SAS Studio Engineer. Read more

Econometrics

Multivariate Time Series Analysis Step

The Multivariate Time Series Analysis step analyzes a vector of time series that are equally spaced. The Multivariate Time Series Analysis step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Forecasting

Modeling and Forecasting Step

The Modeling and Forecasting step creates forecasting models that use your time series data. This step requires data in a valid time series format. The Modeling and Forecasting step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Motif Discovery Step

The Motif Discovery step provides methods to discover frequent patterns or repeated subsequences in time series data. The Motif Discovery step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Motif Scoring Step

The Motif Scoring step tries to find subsequences that are most similar to the target sequence in a new time series. The Motif Scoring step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Similarity Analysis Step

The Similarity Analysis step provides methods to measure the similarity between two time series or among sequences in temporal data. The Similarity Analysis step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

2025.03 (March 2025)

Statistics

Discriminant Analysis Step

For a set of observations with one or more quantitative variables and a classification variable, the Discriminant Analysis step develops a discriminant criterion to classify each observation into a group. The derived discriminant criterion from this data set can be applied to a second data set during the same run. The Discriminant Analysis step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Logistic Regression Statistical Power Step

The Logistic Regression Statistical Power step calculates power and sample size analyses for the likelihood ratio chi-square test of a single predictor in binary logistic regression. This calculation possibly occurs in the presence of one or more covariates that might be correlated with the tested predictor. The Logistic Regression Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Nonparametric Survival Analysis Step

The Nonparametric Survival Analysis step computes nonparametric estimates of the survival distribution function and compares survival functions of two or more groups. The Nonparametric Survival Analysis step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Partial Least Squares Regression Step

The Partial Least Squares Regression step performs partial least squares analysis. It also performs principal components regression and reduced rank regression. These techniques combine dimension reduction of the predictors and dependent variables with predictive modeling. The Partial Least Squares Regression step is

available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Predictive Regression Models Step

The step is predictive in that it selects the most influential effects based on observed data. This step enables you to logically partition your data into disjoint subsets for model training, validation, and testing. The Predictive Regression Models step focuses on the standard independently and identically distributed general linear model for univariate responses and offers great flexibility and insight into the model selection algorithm. The Predictive Regression Models step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Wilcoxon Test Statistical Power Step

The Wilcoxon Statistical Power step calculates power and sample size analyses for the Wilcoxon-Mann-Whitney test for two independent groups. The Wilcoxon Test Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Econometrics

Severity Models Step

The Severity Models step estimates parameters of any arbitrary continuous probability distribution that is used to model the magnitude (severity) of a continuous-valued event of interest. The Severity Models step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Machine Learning

Market Basket Analysis Step

The Market Basket Analysis step performs association rule mining on a transaction data set. The Market Basket Analysis step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Preparing Data

Variable Selection Step

The Variable Selection step enables you to perform unsupervised and supervised variable selection. The task identifies a set of variables that explain the maximum amount of data variance that is contained in the target variable or the data source. The Variable Selection step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

2025.02 (February 2025)

Generating Statistics

Quantile Regression Step

The Quantile Regression step fits predictive models by using quantile regression with automated model selection. The Quantile Regression step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Tests of Proportions Statistical Power Step

Power and sample size analysis optimizes the resource usage and design of a study, which improves the chances of conclusive results with maximum efficiency. The Tests of Proportions Statistical Power step calculates the power or sample size for tests of one proportion, two correlated proportions, and two independent proportions. The Tests of Proportions Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

2025.01 (January 2025)

Generating Statistics

ANOVA Statistical Power Step

The ANOVA Statistical Power step calculates power and sample size analyses for one degree of freedom contrasts and the overall F test. The ANOVA Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Logistic Regression Step

The Logistic Regression step fits predictive models by using logistic regression of a binary response and automated model selection and validation. The Logistic Regression step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Working with Econometrics

Panel Data Models Step

The Panel Data Models step enables you to run analyses for a variety of model types. You can analyze a class of linear econometric models that commonly arise when time series and cross-sectional data is combined. This type of pooled data on time series cross-sectional bases is often referred to as panel data. This step also handles cross-sectional data (data without the time ID values). The Panel Data Models step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Spatial Regression Models Step

The Spatial Regression Models step analyzes a class of linear spatial econometric models for cross-sectional data whose observations are spatially referenced or georeferenced. The Spatial Regression Models step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Preparing Data

Partition Data Step

The Partition Data step enables you to create up to four partitions that are created by randomly sampling the input data. Partitions can be used to develop a model. In this case, you want to train the model on part of the data and reserve some of the data for testing. Using the Partition Data step, you can save all the partitions to one output data set or save each partition in a separate table. The Partition Data step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Unique Identifier Step

The Unique Identifier step returns a Universally Unique Identifier (UUID) as a string of 36 hexadecimal characters and hyphens or a binary value of 16 bytes. The Unique Identifier step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

2024.12 (December 2024)

Generating Statistics

Confidence Intervals Statistical Power Step

The Confidence Intervals Statistical Power step calculates the power or sample size for these confidence intervals: one-sample means, paired means, two-sample means, and one proportion. The Confidence Intervals Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Machine Learning

Gradient Boosting Step

The Gradient Boosting step produces an ensemble of tree-based statistical models called decision trees for interval or nominal targets. It uses the gradient boosting approach. The Gradient Boosting step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

End of Life: SAS Tasks

The task functionality reaches end of life in the 2024.12 stable release and in the LTS 2025.03 release. SAS recommends users convert any existing tasks to custom steps as soon as possible. Read more

SAS Drive Is Now Deprecated

The SAS Drive application is deprecated and disabled by default, starting in the 2024.12 (December 2024) release. The functionality of SAS Drive is now available

on the Content page in SAS Environment Manager, and administrators can re-enable SAS Drive until its official retirement in the 2025.12 release. Read more

2024.11 (November 2024)

Transforming Data

Recode Ranges Step

The Recode Ranges step enables you to specify a range of numeric values and change all of the values in the range to another value. For example, you could replace test scores from 90 to 100 with a letter grade of "A," scores from 80 to 89 with a letter grade of "B," and so on. The Recode Ranges step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Generating Statistics

Cox Regression Statistical Power Step

The Cox Regression Statistical Power step calculates the power or sample size for the score test. This test is for a single scalar predictor in Cox proportional hazards regression for survival data. The Cox Regression Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Custom Tests Statistical Power Step

The Custom Tests Statistical Power step calculates power or sample size for test statistics from the chi-square, Pearson correlation, normal, F, and t distributions. The Custom Tests Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Survival Rank Tests Step

The Survival Rank Tests step calculates power, sample size, or number of events for two-sample survival rank tests. The Survival Rank Tests step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

t Tests Statistical Power Step

The t Tests Statistical Power step calculates the power or sample size for t tests of means and mean ratios. The t Tests Statistical Power step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Preparing Data

Label Encoding Step

The Label Encoding step converts low cardinality categorical variables into a sparse label-encoded representation. The Label Encoding step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Displaying Detailed Status Messages in the Submission Status Window

You can use the new Display detailed status information in the Submission Status option to display the status messages that are generated as your SAS programs run. Read more

2024.10 (October 2024)

New Welcome to SAS Viya Page

On the new Welcome to SAS Viya page, you can access demos, learn more about SAS Viya platform applications, and change your global settings. By default, this page appears when you sign in to a SAS Viya platform application. If you have used the "Initial view" global setting to specify what you want to open at start-up, that setting is honored and the Welcome to SAS Viya page does not appear. Read more

Transforming Data

Recode Values Step

The Recode Values step enables you to change the values of character and numeric variables. With this step, you can specify single values to be recoded as other values of the same type. The Recode Values step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Generating Statistics

Hierarchical Clustering Step

The Hierarchical Clustering step enables you to perform hierarchical cluster analysis. The Hierarchical Clustering step can be used with either coordinate data or distance data. The Hierarchical Clustering step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

K-Means Clustering Step

The K-Means Clustering step enables you to cluster interval or ratio data using the k-means algorithm. This step is a good starting point for cluster analysis. The K-

Means Clustering step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Working with Econometrics

Aggregate Loss Models Step

The Aggregate Loss Models step computes an estimate of the probability distribution model of the aggregate loss. This estimate is based on the knowledge of the distribution of loss severity and loss count. The Aggregate Loss Models step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Preparing Data

Standardize Data Step

If you are running the Standardize Data step using the SAS CAS Server, you can center and scale values so that different features are equally weighted. The Standardize Data step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Changes from Previous Releases

The root URL for the SAS Viya platform now routes users to `https://prod.example.com/SASLanding/` by default. Previously, the root URL was routed to `https://prod.example.com/SASDrive/` by default.

2024.09 (September 2024)

Integrating Data

Lookup Step

The Lookup step enables you to add information to your data by looking up data values in reference, or lookup, tables. You can add the lookup data, along with data from a source table, to a target table. The Lookup step also provides a means of protecting your data quality by enabling you to define actions, such as writing data to an exception table, when there is no match in a lookup table for data in the source table. The Lookup step is available only if your site licenses SAS Studio Engineer. Read more

Generating Statistics

Equivalence Tests Statistical Power Step

The Equivalence Tests Statistical Power step performs power analysis and sample size determination for equivalence tests of one-sample mean, paired means, two-sample means, and one proportion. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Multiple Regression Statistical Power Step

Power and sample size analysis optimizes the resource usage and design of a study, which improves the chances of conclusive results with maximum efficiency. The Multiple Regression Statistical Power step calculates the power or sample size for multiple regression. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Managing Models

Assess Model Step

The Assess Model step evaluates the performance of a predictive model by comparing the predicted and actual target values in a scored data set. Based on the type of target, performance measures such as ROC, lift, and fit statistics are available. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Preparing Data

Transform Columns Step

The Transform Columns step enables you to transform one or more variables in the input data set. These transformed variables are saved to an output data set. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Working with Machine Learning

Forest Step

The Forest step produces an ensemble of tree-based statistical models called decision trees for interval or nominal targets. It uses the Random Forest approach. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Robust Principal Component Analysis Step

Robust Principal component analysis is a multivariate technique for examining relationships among several quantitative variables. Use principal component analysis if you are interested in summarizing data and detecting linear

relationships. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Optimization and Network Analysis

Community Detection Step

The Community Detection step partitions a graph into communities such that the nodes within the community subgraphs are more densely connected than the nodes from different communities. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Flow Macro Variables

SAS Studio now generates these macro variables when you run a flow:

- FLOW_ID contains the flow ID for a flow that is saved in a SAS Content location. This variable value is populated only if the flow has been saved.
- FLOW_NAME contains the name of the flow.

You can use these macro variables in other steps in the flow in which you write your own SAS code, including the SAS Program step and custom steps.

To view the macro variables, click the **Generated Code** tab, and then expand the "Generated flow setup" region.

Query Step: Added Support for Explicit Pass-Through

If you are creating a query in a flow, you can now use explicit pass-through for queries that contain only SingleStore or only Snowflake tables. Read more

Custom Steps: Option Table Control

Use the option table control to create a repeatable group of controls that is displayed in the user interface as a table. Read more

2024.08 (August 2024)

Examining Your Data

Explore Data Step

The Explore Data step provides graphs that can be used to explore the relationships among selected variables. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Working with Machine Learning

Bayesian Network Step

The Bayesian Network step trains a predictive model of a nominal target using different types of Bayesian network structures, including parent-child Bayesian network (default), Markov blanket, naive Bayesian network, or tree-augmented naive Bayesian network. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Factorization Machine Step

The Factorization Machine step combines the advantages of smart machine vision (SMV) with factorization models. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Optimization and Network Analysis

Connected Components Step

The Connected Components step finds all the connected components in a graph. A connected component in a graph is a set of nodes that have a path between them. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Linear Assignment Step

The Linear Assignment step assigns any objects from one group to objects in a second group at minimal costs. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Shortest Paths Step

The Shortest Paths step calculates paths between sets of nodes in the input graph with the lowest total link weight. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Analyzing Text

Text Parsing and Topic Discovery Step

The Text Parsing and Topic Discovery step is used to parse documents into a term-by-document matrix and extract topics from the term-by-document matrix. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

2024.07 (July 2024)

Machine Learning

Automated Feature Engineering Step

The Automated Feature Engineering step explores the variables in the input data and automatically performs feature engineering in a parallel, scalable way. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Support Vector Machine Step

The Support Vector Machine step performs classification analysis for binary targets by using a support vector machine, which is a supervised machine learning method. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Optimization and Network Analysis

Cycle Detection Step

The Cycle Detection step finds the elementary cycles of an input graph. An elementary cycle is a path in which the start node and the end node are the same, and no node appears more than once in the sequence. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Reach Network Step

The Reach Network step calculates the reach (ego) network of a graph. In the context of social networks, reach networks are often referred to as ego networks, because they focus on the neighbors of one particular individual (or more than

one). This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

2024.06 (June 2024)

Optimization and Network Analysis

Minimum Cost Network Flow Step

The Minimum Cost Network Flow (MCF) step is a fundamental problem in network analysis that involves sending flow over a network at minimal cost. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Minimum Spanning Tree Step

A spanning tree of a connected undirected graph is a subgraph. This subgraph is a tree that connects all the nodes. The Minimum Spanning Tree (MST) step finds the spanning tree, among all possible spanning trees, that has the minimum link cost. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Transitive Closure Step

The Transitive Closure step calculates the transitive closure of a graph. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Generating Statistics

Decision Tree Step

The Decision Tree step produces tree-based statistical models called decision trees for nominal and interval targets. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Summary and Level Statistics Step

The Summary and Level Statistics step computes level and descriptive statistics for variables in a data source. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Summary Tables Step

The Summary Tables step displays descriptive statistics in tabular format, using some or all of the variables in a data set. You can create a variety of tables, ranging from simple to highly customized. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Visualizing Data

Mosaic Plot Step

Mosaic plots display tiles that correspond to the crosstabulation table cells. The areas of the tiles are proportional to the frequencies of the table cells. The column variable is displayed on the X axis, and the tile widths are proportional to the relative frequencies of the column variable levels. The row variable is displayed on the Y axis, and the tile heights are proportional to the relative frequencies of the row levels within column levels. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Analyzing Text

Segmentation Step

The Segmentation step segments text data using k-means clustering. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Text Scoring Step

The Text Scoring step scores a data table using tables that are generated by another Text Analytics step. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Specifying Which Row in a File Contains Column Names

A new option for File nodes enables you to specify which row in a file is the header row. This option does not apply to Microsoft Excel files. Read more

Git Profiles: Support for HTTPS Authentication and Password-Protected SSH Keys

When you are creating a Git profile, you can now configure SAS Studio to store and access HTTPS authentication criteria and password-protected SSH keys using the SAS Environment Manager credential service. Read more

2024.05 (May 2024)

Generating Statistics

Analysis of Covariance Step

The Analysis of Covariance step fits a linear model that combines the continuous and categorical predictors of a continuous dependent variable. This step also produces graphical output to interpret the results. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Estimate Within-Cluster Covariances Step

The Estimate Within-Cluster Covariances step uses the Art, Gnanadesikan, and Kettenring method to estimate within-cluster covariances. This approach might result in more spherical clusters when the resulting canonical variables are clustered. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Linear Regression Step

Using the Linear Regression step, you can perform linear regression analysis on multiple dependent and independent variables. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Nonparametric One-Way ANOVA Step

The Nonparametric One-Way ANOVA step consists of nonparametric tests for location and scale differences across a one-way classification. The step also provides a standard analysis of variance on the raw data and statistics based on the empirical distribution function. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Preparing Data

Imputation Step

The Imputation step replaces missing values in a data source with an estimate of the missing value. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Optimization and Networking

Biconnected Components Step

A biconnected component of an undirected graph is a connected subgraph that cannot be broken into disconnected pieces by deleting any single node (and its incident links). The Biconnected Components step finds all biconnected components of such a graph. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Centrality Metrics Step

The Centrality Metrics step calculates several types of centrality metrics that indicate the relative importance of a node or link within a graph. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Maximal Cliques Step

The Maximal Cliques step finds the maximal cliques of a graph. A clique is an induced subgraph such that every node in that subgraph is connected to every other node. A maximal clique is a clique that is not a subset of the nodes of any larger clique. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Minimum Cut Step

The Minimum Cut step finds a minimum cut of an undirected graph that has the smallest link metric. A cut is a partition of the nodes of a graph into two disjoint subsets. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Traveling Salesman Problem Step

The traveling salesman problem (TSP) finds a minimum-cost tour in a graph. A tour of a graph is a sequence of nodes where the start node and end node are the same, and every node in the graph is visited exactly once. In solving the TSP, the goal is to find a tour that minimizes the costs of the links. This step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Running a Portion of a Program in a Flow

You can select a block of code to run in a SAS or Python program in a flow. Read more

Copying the Full Path of a File or Folder to the Clipboard

You can now copy the full path of a file or folder to the clipboard from the Explorer pane. Read more

2024.04 (April 2024)

Enriching Data

Verify with Loqate Step

The Verify with Loqate step enables you to verify addresses, emails, and phone numbers that use the Loqate Verify API. This step replaces three previous steps: Verify & Geocode Addresses - Loqate, Verify Email Addresses - Loqate, and Verify Phone Numbers - Loqate. Read more

Generating Statistics

One-Way ANOVA Step

The One-Way ANOVA step tests and provides graphs for differences among the means of a single categorical variable on a single continuous dependent variable. The One-Way ANOVA step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Working with Econometrics

Hidden Markov Models Step

The Hidden Markov Models step analyzes the time series or panel data by using a statistical Markov model to infer hidden states through a Markov process. The Hidden Markov Models step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Preparing Data

Standardize Data Step

The Standardize Data step enables you to center or standardize one or more numeric variables by using a variety of methods. The Standardize Data step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Working with Machine Learning

Semi-supervised Learning Step

The Semi-supervised Learning step iteratively propagates the labels from the labeled data to the unlabeled data by computing the similarity measure between pairs of data. The Semi-supervised Learning step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Support Vector Data Description Step

The Support Vector Data Description step is a one-class classification machine learning technique. The Support Vector Data Description step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Optimization and Network Analysis

Network Summary Step

The Network Summary step calculates various summary statistics for a graph and its nodes. The Network Summary step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Controlling the Statistical Process

Capability Analysis Step

The Capability Analysis step compares the distribution of a process to its specification limits. The Capability Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Analyzing Text

Text Summarization Step

The Text Summarization step generates textual summaries of text data. The Text Summarization step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Custom Steps: Enhancements to the Column Selector Control

When creating a custom step, you can specify whether the values for the column selector control come from an input table or from another column selector control. Read more

2024.03 (March 2024)

Integrating Data

Load Table Step with SingleStore Data

If both the source and target tables are located in a SingleStore database, you can now use native SQL code for the Upsert rows technique. This option can improve performance. Read more

Visualizing Data

Series Map Step

The Series Map step creates a map overlaid with a series plot. The Series Map step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Preparing Data

Binning Step

The Binning step divides the data values of a continuous variable into intervals. The values for each interval are replaced with a single value that is representative of the interval. The Binning step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Enhancing Data Quality

Licensing Change: Clean Data and Parse Data Steps

The Clean Data and Parse Data steps have been updated and are now available only in SAS Studio Engineer. If you added a Clean Data or Parse Data step to a flow when using SAS Studio Analyst or SAS Studio Engineer, you must remove the deprecated step from the flow. Then you can add the Clean Data or Parse Data step back to the flow using SAS Studio Engineer. Read more

Generating Statistics

Canonical Correlation Step

The Canonical Correlation step performs canonical correlation, partial canonical correlation, and canonical redundancy analysis. The Canonical Correlation step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Cluster Variables Step

The Cluster Variables step finds clusters of variables to use in additional clustering or to select non-redundant variables in further clustering. The Cluster Variables step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Compute Similarities and Distances Step

The Compute Similarities and Distances step computes various measures of distance, dissimilarity, or similarity between observations in an input table. This information can be used in hierarchical cluster analysis and in multidimensional scaling. The Compute Similarities and Distances step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Correspondence Analysis Step

The Correspondence Analysis step performs simple or multiple correspondence analysis of qualitative data. You can specify either raw data or table data for the input data source. The Correspondence Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Factor Analysis Step

The Factor Analysis step performs a factor analysis with a variety of available methods and rotations. The Factor Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Multidimensional Preference Analysis Step

The Multidimensional Preference Analysis step performs a principal components analysis of rank-ordered data. The principal result is a plot of the scores. These scores are the objects that are being rated. In the plot, the scores are represented as points, and the structure (raters) are represented as vectors. The Multidimensional Preference Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Optimization and Network Analysis

Core Decomposition Step

The Core Decomposition step decomposes a graph into cohesive subgroups. The Core Decomposition step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Working with Econometrics

Causal Models Step

The Causal Models step uses the two-stage least squares method and the Heckman's two-step selection method. The Causal Models step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Working with Machine Learning

Fast k-Nearest Neighbors Step

The Fast k-Nearest Neighbors step searches for the k-nearest neighbors (KNN) of the specified data. The Fast k-Nearest Neighbors step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Converting SAS Tasks to SAS Custom Steps

The task functionality will reach end-of-life in the 2024.12 stable release and in the LTS 2025.03 release. SAS recommends users convert any existing tasks to custom steps as soon as possible. Read more

Starting with the 2024.07 stable release and the LTS 2024.09 release of SAS Studio, the **Tasks** pane will not be available from the SAS Studio workspace by default. To access the **Tasks** pane, select **View** ⇨ **Navigation panes** ⇨ **Tasks**.

Indenting Options and Sections in Custom Steps

When authoring a custom step, you can use the Indent option (which is available for all controls and sections) to specify whether to indent an option, text, or section in the user interface. Using indention enables you to visually show a hierarchy of sections, options, and text. It also enables to you to group options under a section heading. Read more

2024.02 (February 2024)

Visualizing Data

Bubble Map Step

The Bubble Map step creates a map that is overlaid with a bubble plot. The Bubble Map step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Scatter Map Step

The Scatter Map step creates a map that is overlaid with a scatter plot. The Scatter Map step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Text Map Step

The Text Map step creates a map that is overlaid with a text scatter plot. The Text Map step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Generating Statistics

Coin Toss Simulation Step

The Coin Toss Simulation task simulates the tossing of a specified number of coins. The results show the frequency and percentage of occurrences that the coin displays heads given a specified number of tosses. The Coin Toss Simulation step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Poker Hand Probability Step

The Poker Hand Probability step calculates the frequency and probability of poker hands. The Poker Hand Probability step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Same Birthday Probability Step

The Same Birthday Probability step computes the probability that two or more people in a room have the same birthday. The Same Birthday Probability step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

t Tests Step

The t Tests step enables you to perform a one-sample test, a paired test, or a two-sample test. The t Tests step is available in SAS Studio Analyst or SAS Studio Engineer. Read more

Working with Machine Learning

Moving Window Principal Component Analysis Step

The Moving Window Principal Component Analysis step can be used to assess how principal components change over time. The Moving Window Principal Component Analysis step is available in SAS Studio Analyst or SAS Studio Engineer. Read more

Controlling the Statistical Process

Analysis of Means Step

Analysis of means is a method for simultaneously comparing treatment means with their overall mean. The Analysis of Means step is available in SAS Studio Analyst or SAS Studio Engineer. Read more

Control Charts Step

The Control Charts step creates Shewhart control charts for deciding whether a process is in a state of statistical control. The Control Charts step is available only if your site licenses SAS Studio Analyst or SAS Studio Engineer. Read more

Pareto Analysis Step

Pareto charts display the frequencies of quality-related problems in a process. The frequencies are represented by bars that are ordered in decreasing magnitude. Thus, you can use a Pareto chart to decide which subset of problems to solve first or which problem areas deserve the most attention. The Pareto Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Enhancing Data Quality

Licensing Change: Match Codes Step

The Match Codes step has been updated and is now available only in SAS Studio Engineer. If you added a Match Codes step to a flow when using SAS Studio Analyst or SAS Studio Engineer, you must remove the deprecated step from the flow. Then you can add the Match Code step back to the flow using SAS Studio Engineer. Read more

Transforming Data

Stack Columns Step

By default, no case identifier is created by the step. You must specify whether to create a case identifier variable, or you can select identifier variables from the input table. The Stack Columns step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Adding Subflows to a Flow

You can now add subflows to your flow from a SAS server location. Read more

2024.01 (January 2024)

Enhancing Data Quality

Clean Data Step

The Clean Data step performs Standardization, Casing, Identification Analysis, Gender Analysis, and Pattern Analysis by using the QKB locale. The Clean Data step is available in SAS Studio Engineer. Read more

Parse Data Step

The Parse Data step performs Parsing and Extraction by using the QKB locale. The Parse Data step is available in SAS Studio Engineer. Read more

Visualizing Data

Choropleth Map Step

The Choropleth Map step creates a map of polygonal areas. The Choropleth Map step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Series Plot Step

The Series Plot step creates plots that display a series of line segments that connect observations of input data. The Series Plot step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Generating Statistics

Combinations Step

The Combinations step computes the possible combinations of the total number of objects into sets with a specified number in each set. The Combinations step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Dice Roll Simulation Step

The Dice Roll Simulation step simulates rolling a specified number of dice. The results show the frequency and percentage of each possible roll given a specified number of throws. The Dice Roll Simulation step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Permutations Step

The Permutations step computes the possible permutations of a given number of objects. The Permutations step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Managing Models

Register Python Model Step

Using this step, you can register into SAS Model Manager your Python models that have been trained in SAS Studio. Then you can use the functionality in SAS Model Manager to manage and govern your trained models.This step is available only for

classification models with a binary target. The Register Python Model step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Transforming Data

Remove Duplicates Step

You can now specify whether to write duplicate rows to the log or save duplicate rows to a table. Read more

Custom Steps: Link Control

Use the Link control to add hyperlinks to your custom steps. For security reasons, this feature must be enabled by your SAS administrator in SAS Environment Manager. Read more

New Data Quality Snippets

There are several new Data Quality Snippets: Match Action Clustering, OPTNET Clustering, RTENG Clustering, and Survivorship. Read more

- The Match Action Clustering snippet uses the Entity Resolution action set (`entityres.match`) to cluster data based on fuzzy matching. The output table contains the input columns and a cluster ID column that contains the cluster number.
- The OPTNET Clustering snippet uses the DQCLNET macro to cluster matching records based on the specified match rules. Multiple match rules represent OR matching conditions. Multiple columns within a match rule represent AND matching conditions.
- The RTENG Clustering snippet uses the DQCLRTNG macro to cluster data based on fuzzy matching. The macro uses the RTENG action set to perform exact matching and clustering. The output table contains the input columns and a cluster ID column that contains the cluster number.
- The Survivorship snippet uses the DQSUVR macro to identify a surviving record from a group of records in a cluster. The output also shows different methods to compose and indicate the surviving record.

Implement SCD Step with SingleStore Data

Support for Generating Surrogate Keys

If you are using SingleStore data, you can now use a surrogate key that is generated elsewhere, or you can generate the surrogate key in SAS Studio. Read more

Optional Flagging Method

The flagging method, which is used to identify the current row, is now optional if you are using SingleStore data. Read more

2023.12 (December 2023)

Important Change: System Options in SAS Studio

SAS Studio automatically sets several system options before each code submission. The list of system options on the SAS Viya 4 platform is different from the list in SAS 9.4 and SAS Viya 3.5. Read more

Bubble Plot Step

The Bubble Plot step explores the relationship between three or more variables. In a bubble plot, two variables determine the location of the bubble centers, and a third variable specifies the size of each bubble. A fourth variable can be used to determine the colors of the bubbles. The Bubble Plot step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Heat Map Step

The Heat Map step displays the magnitude of the response based on two variables. The response is represented as a color value from a color gradient. The Heat Map step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Histogram Step

The Histogram step creates a chart that displays the frequency distribution of a numeric variable. The Histogram step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Pie Chart Step

The Pie Chart step creates pie charts that represent the relative contribution of the parts to the whole by displaying data as wedge-shaped "slices" of a circle. Each slice represents a category of data. The size of a slice represents the contribution of the data to the total chart statistic. The Pie Chart step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Manage Columns Step

Support for Creating Columns and Changing Column Properties

You can now create a column in the output table when you run the Manage Columns step. You can also update the name, label, data type, length, format, and informat of a column in the output table. Read more

Creating a Data View from the Output Port

You now have the option to create a data view instead of a physical table from the output port of a Manage Columns node. Read more

2023.11 (November 2023)

Characterize Data Step

The Characterize Data step creates a summary report of tables and graphs that describe the variables in the input data set. This step can also create frequency and univariate output tables that describe the main characteristics of the data.The Characterize Data step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Correlation Analysis Step

Correlation is a statistical procedure for describing the relationship between numeric variables. The relationship is described by calculating correlation coefficients for the variables. The correlations range from –1 to 1. The Correlation Analysis step provides graphs and statistics for investigating associations among variables. The Correlation Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Describe Missing Data Step

The Describe Missing Data step displays the frequencies and percentages of missing values for each selected variable. If two or more variables are assigned to this step, the step displays the pattern of missing data across variables. The Describe Missing Data step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Library for Temporary Output Files in Flows

You can use the new Default output library for intermediate tables option to change the default library for temporary output files in all flows or for a single flow. Read more

New Git Functions

Use the new GIT_REF_LIST, GIT_REF_GET, and GIT_REF_FREE functions to list all references in a local Git repository and either display the information in the SAS log or create an in-memory data structure.

- GIT_REF_LIST returns the list of reference objects that are associated with the local repository.
- GIT_REF_GET returns the specified attribute of a reference object in the local repository.
- GIT_REF_FREE clears the reference objects that are associated with the local repository.

LTS 2023.10 (November 2023)

Bar Chart Step

The Bar Chart step creates horizontal or vertical bar charts that compare numeric values or statistics between different values of a chart variable. Bar charts show the relative magnitude of data by displaying bars of varying height. Each bar represents a category of data. Read more

Bar-Line Chart Step

The Bar-Line Chart step creates a vertical bar chart with a line chart overlay. Read more

List Data Step

The List Data step displays the contents of a table as a report. The List Data step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

List Table Attributes Step

The List Table Attributes step enables you to quickly see the date on which the table was created and last modified, the number of rows, the encoding, any engine-dependent or host-dependent information, and an alphabetical list of the variables and their attributes. You can also view any directory and host or engine information by using this step. The List Table Attributes step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Mask Data Step

Use the Mask Data step to perform data masking by using three different obfuscation methods: masking, hashing, or substitution. The Mask Data step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Match Codes Step

Use the Match Codes step to create match codes that can be used as a basis for standardization or transformation. Using the Match Codes step, you can create a match code for a column that is based on a locale and a rule definition. The Match Codes step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Register SAS Model Step

The Register SAS Model step imports a scoring model from SAS Studio into SAS Model Manager. A scoring model is an analytic object in a CAS table. The Register SAS Model step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Scatter Plot Step

The Scatter Plot step creates plots that show the relationships between two or three variables by revealing patterns or concentrations of data points. The Scatter Plot step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Split Columns Step

The Split Columns step creates an output table by splitting the unique combination of values of the selected columns in the input table into multiple columns. You can use the output table to individually analyze the columns that contain multiple rows of the input table. The Split Columns step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Stack Columns Step

The Stack Columns step creates an output table by restructuring the selected columns in the input table so that these columns are transposed into observations. You can use the output table to analyze values across multiple columns of the input table. If you group the observations, the selected columns are divided into subgroups that are based on the unique combinations of the grouping values. Each subgroup forms a row of the output table. The Stack Columns step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Summary Statistics Step

The Summary Statistics step provides descriptive statistics for variables across all observations and within groups of observations. You can also summarize your data in a graphical display such as histograms and box plots. The Summary Statistics step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Table Analysis Step

The Table Analysis step provides one-way to n-way frequency and contingency (crosstabulation) tables. This step also generates statistics about the association between rows and columns. The Table Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Union Rows Step

The Union Rows step enables you to combine data from multiple sources into a single target table. You can subset the source data and choose from multiple set operators to determine how to combine the data sources. Read more

Creating a Data View from the Output Port of the Query Step

You now have the option to create a data view instead of a physical table from the output port of a Query node. You can create a data view only when the query uses PROC SQL to generate the results. Read more

Job Definitions

You can now create step prompts by using JSON code in job definitions. You can run these prompts in SAS Visual Analytics. Read more

Enablement Property for Custom Steps

The custom step author can use the enabled property to create a dependency between two controls. When the dependency condition is true, the dependent option is enabled in the user interface, and the user of the step can specify a value. When the dependency condition is false, the dependent option is visible in the user interface but disabled. Read more

Using QKB Files in Custom Steps

The SASDQREF library contains several Quality Knowledge Base (OKB) data sets. The files in this library are intended to be used to create custom steps only. These data sets contain the metadata that is used to populate locale and definition controls in custom steps such as Mask Data and Match Codes. The use of these files eliminates the need to hardcode values for locale and rule definition. For more information, see "Using QKB Files in Custom Steps" in *SAS Studio: Working with Custom Steps*.

2023.09 (September 2023)

Box Plot Step

The Box Plot step represents numeric values measured as intervals. The box plot is a bi-directional plot. It uses Category and Analysis as role names, and the corresponding axes are called Category Axis and Analysis Axis. The Box Plot step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Distribution Analysis Step

The Distribution Analysis step provides information about the distribution of numeric variables. A variety of plots such as histograms, probability plots, and quantile-quantile plots can be used in this analysis. The Distribution Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Line Chart Step

The Line Chart step shows the mathematical relationships between variables by revealing trends or patterns of data points. The Line Chart step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Select Random Sample Step

The Select Random Sample step creates an output table that contains a random sample of the rows in the input table. You might use this step when you need a subset of the data. The Select Random Sample step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Insert Method in the Load Table Step

You can now select whether to use PROC APPEND or the PROC SQL INSERT statement to insert data into the target table. If the target table is a SAS table type,

such as a Base SAS or SPD Server table, the PROC APPEND option can improve performance. Read more

Number Field Control in Custom Steps

As a step author, you can now specify whether the value for a number field control must be an integer. Read more

2023.08 (August 2023)

Match Codes Step

Use the Match Codes step to create match codes that can be used as a basis for standardization or transformation. Using the Match Codes step, you can create a match code for a column that is based on a locale and a rule definition. The Match Codes step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Scatter Plot Step

The Scatter Plot step creates plots that show the relationships between two or three variables by revealing patterns or concentrations of data points. The Scatter Plot step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

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The Summary Statistics step provides descriptive statistics for variables across all observations and within groups of observations. You can also summarize your data in a graphical display such as histograms and box plots. The Summary Statistics step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Table Analysis Step

The Table Analysis step provides one-way to n-way frequency and contingency (crosstabulation) tables. This step also generates statistics about the association

between rows and columns. The Table Analysis step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

2023.07 (July 2023)

Mask Data Step

Use the Mask Data step to perform data masking by using three different obfuscation methods: masking, hashing, or substitution. The Mask Data step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Register SAS Model Step

The Register SAS Model step imports a scoring model from SAS Studio into SAS Model Manager. A scoring model is an analytic object in a CAS table. The Register SAS Model step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Using QKB Files in Custom Steps

The SASDQREF library contains several Quality Knowledge Base (QKB) data sets. The files in this library are intended to be used to create custom steps only. These data sets contain the metadata that is used to populate locale and definition controls in custom steps such as Mask Data and Match Codes. The use of these files eliminates the need to hardcode values for locale and rule definition. For more information, see "Using QKB Files in Custom Steps" in *SAS Studio: Working with Custom Steps*.

2023.06 (June 2023)

Job Definitions

You can now create step prompts by using JSON code in job definitions. You can run these prompts in SAS Visual Analytics. Read more

2023.05 (May 2023)

Union Rows

The Union Rows step enables you to combine data from multiple sources into a single target table. You can subset the source data and choose from multiple set operators to determine how to combine the data sources. Read more

2023.04 (April 2023)

Bar Chart Step

The Bar Chart step creates horizontal or vertical bar charts that compare numeric values or statistics between different values of a chart variable. Bar charts show the relative magnitude of data by displaying bars of varying height. Each bar represents a category of data. Read more

Bar-Line Chart Step

The Bar-Line Chart step creates a vertical bar chart with a line chart overlay. Read more

Creating a Data View from the Output Port of the Query Step

You now have the option to create a data view instead of a physical table from the output port of a Query node. You can create a data view only when the query uses PROC SQL to generate the results. Read more

LTS 2023.03 (May 2023)

Critical Change for Users of Persistent Storage

If your site is upgrading to LTS 2023.03, your SAS administrator needs to be aware of new settings in identities services that impact persistent file storage.

Because of new default settings that were added in the 2022.10 stable release, SAS Viya 4 uses auto-generated UIDs instead of user-defined UIDs. (In previous releases, SAS Compute, CAS, and DMBS servers accessed file storage locations by using user-defined UIDs.)

To continue accessing persistent file locations by using user-defined UIDs, customers need to change the `identifier.generateUids` configuration property to `false`. For more information, see "Steps for the SAS Studio Administrator" in *SAS Studio: Administrator's Guide*.

Geocoding Step

Geocoding is the process of adding geographic coordinates (latitude and longitude values) to an address. The Geocoding step provides a way to convert address data into map locations. The Geocoding step also enables you to add coordinates to IP addresses. (This is called geolocating.) Read more

Implement SCD Step

The Implement SCD step enables you to use the slowly changing dimensions (SCD) process to load data into target dimension tables. The data changes slowly, rather than changing on a time-based, regular schedule. The target tables are structured so that they can retain a history of changes to their data. This record of data changes can provide a basis for analysis. You can also choose to overwrite your data with new values and not preserve the historical data. This step is available only if you license SAS Studio Engineer. Read more

Merge Table Step: Support for Editing and Previewing the SQL Expression

You can now use the SQL editor to create SQL code for your Merge Table expression. The SQL code is passed to the target database for processing using explicit pass-through, so you should use the SQL syntax of your data source. You can also preview the merge expression that is generated by SAS Studio if you have specified one or more key columns and at least one column to update or insert. Read more

One-Way Frequencies Step

The One-Way Frequencies step generates frequency tables from your data. You can also use this step to perform binomial and chi-square tests. The One-Way Frequencies step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Query Step: Creating a Data View

You now have the option to create a data view instead of a physical table when you connect a Table node to the output port of a Query node. You can create a data view only when the query uses PROC SQL to generate the results. Read more

Rank Data Step

The Rank Data step computes ranks for one or more numeric variables across the rows in a table and includes the ranks in an output table. The Rank Data step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Remove Duplicates Step

The Remove Duplicates node enables you to remove duplicates rows from an input data source. Read more

Table and Load Table Steps: Using Macro Variables

You can now use macro variables to represent table and library names in the Table and Load Table steps.

Transpose Data Step

The Transpose Data step turns selected columns of an input table into the rows of an output table. The Transpose Data step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Custom Steps

Date and Time Control for Custom Steps

Using the datetime control, you can create a date, month, datetime, or time picker for your custom steps. Read more

Custom Steps: New Macro Variable for Column Selector Control

For a column selector control, SAS Studio generates a macro variable that lists all of the column names selected for that control. In this example, three columns are selected in the column step: Invoice, Sales, and Product: `%let columnselector1=Invoice Sales Product;`. For more information, see "Understanding Macro Variables" in *SAS Studio: Working with Custom Steps*.

Custom Steps in a Flow

When you add a custom step to a flow, the step becomes a node in the flow. Now when you view the properties of a step node, you can view the location of the file in SAS Content or on the SAS Server. For more information, see "Custom Steps in Flows" in *SAS Studio: Working with Custom Steps*.

Hardcoding the Value of the Input Table or Column in a Custom Step

When creating or editing a step, the step author can provide a hardcoded reference to a table or column. This hardcoded value is saved with the step. The step author can specify whether these hardcoded values are displayed as read-only values in the user interface or are hidden from the end user. In either case, the end user cannot change the saved values. When the steps runs, SAS Studio uses the values that are specified by the step author. For more information, see the documentation for the Input Table control and the Column Selector control. Read more

Column Exclusion in Custom Steps

You can exclude the selected values in a column selector from being reused in another column selector. The Exclude columns functionality is available from the Properties pane for the column selector control. Read more

Stand-Alone and Flow Queries: Support for Explicit Pass-Through

If your query contains only tables from an Oracle database, you can now use explicit pass-through to pass your SQL code to the Oracle database for processing. If your data files are very large, this option can improve your performance because the files do not have to be copied to the SAS server for processing. Read more

Deploying and Redeploying a Flow or Program as a Job

After saving a flow or program, you can deploy the flow or program as a job. Deployed jobs are available in SAS Studio and other SAS applications, such as SAS Environment Manager. After you deploy the flow or program, you can still make changes to the flow or program and then redeploy the job. Read more

2023.02 (February 2023)

One-Way Frequencies Step

The One-Way Frequencies step generates frequency tables from your data. You can also use this step to perform binomial and chi-square tests. The One-Way Frequencies step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Transpose Data Step

The Transpose Data step turns selected columns of an input table into the rows of an output table. The Transpose Data step is available in SAS Studio Analyst and SAS Studio Engineer. Read more

Column Exclusion in Custom Steps

You can exclude the selected values in a column selector from being reused in another column selector. The Exclude columns functionality is available from the Properties pane for the column selector control. Read more

2023.01 (January 2023)

Custom Steps in a Flow

When you add a custom step to a flow, the step becomes a node in the flow. Now when you view the properties of a step node, you can view the location of the file in SAS Content or on the SAS Server. For more information, see "Custom Steps in Flows" in *SAS Studio: Working with Custom Steps*.

Macro Variables in the Table and Load Table Steps

You can now use macro variables to represent table and library names in the Table and Load Table steps.

2022.12 (December 2022)

Custom Steps: New Macro Variable for Column Selector Control

For a column selector control, SAS Studio generates a macro variable that lists all of the column names selected for that control. In this example, three columns are selected in the column step: Invoice, Sales, and Product: `%let columnselector1=Invoice Sales Product;`. For more information, see "Understanding Macro Variables" in *SAS Studio: Working with Custom Steps*.

Implement SCD Step: Support for Previewing the SQL Expression

You can now preview the expression that is generated by SAS Studio if you have specified one or more key columns and at least one column for SCD Type 1 or Type 2 changes.

2022.11 (November 2022)

New Implement SCD Step

The Implement SCD step enables you to use the slowly changing dimensions (SCD) process to load data into target dimension tables. The data changes slowly, rather than changing on a time-based, regular schedule. The target tables are structured so that they can retain a history of changes to their data. This record of data changes can provide a basis for analysis. You can also choose to overwrite your data with new values and not preserve the historical data. This step is available only if you license SAS Studio Engineer. Read more

Geocoding Step

Geocoding is the process of adding geographic coordinates (latitude and longitude values) to an address. The Geocoding step provides a way to convert address data into map locations. The Geocoding step also enables you to add coordinates to IP addresses. (This is called geolocating.) Read more

Remove Duplicates Step

The Remove Duplicates node enables you to remove duplicates rows from an input data source. Read more

Merge Table Step: Support for Editing and Previewing the SQL Expression

You can now use the SQL editor to create SQL code for your Merge Table expression. The SQL code is passed to the target database for processing using explicit pass-through, so you should use the SQL syntax of your data source. You can also preview the merge expression that is generated by SAS Studio if you have specified one or more key columns and at least one column to update or insert. Read more

Stand-Alone and Flow Queries: Support for Explicit Pass-Through

If your query contains only tables from an Oracle database, you can now use explicit pass-through to pass your SQL code to the Oracle database for processing. If your data files are very large, this option can improve your performance because the files do not have to be copied to the SAS server for processing. Read more

Date and Time Control for Custom Steps

Using the datetime control, you can create a date, month, datetime, or time picker for your custom steps. Read more

2022.10 (October 2022)

Critical Change for Users of Persistent Storage

If your site is upgrading to 2022.10, your SAS administrator needs to be aware of new settings in identities services that impact persistent file storage.

Because of new default settings in 2022.10, SAS Viya 4 uses auto-generated UIDs instead of user-defined UIDs. (In previous releases, SAS Compute, CAS, and DMBS servers accessed file storage locations by using user-defined UIDs.)

To continue accessing persistent file locations by using user-defined UIDs, customers need to change the `identifier.generateUids` configuration property to `false`. For more information, see "Steps for the SAS Studio Administrator" in *SAS Studio: Administrator's Guide*.

LTS 2022.09 (November 2022)

Flows

Subflows

You can create a subflow by adding a saved flow to your flow. A subflow can be useful if you have a group of nodes that you want to use in multiple locations. You can also use a subflow to reduce the complexity of a flow. Read more

Load Table Step: Support for Creating a Physical Table with the Upsert Rows Technique

When you are loading data that uses the Upsert Rows technique, you can now choose to automatically create a physical target table if one does not exist. For more information, see Load Table Step in *SAS Studio: User's Guide*.

Load Table Step: Updated Support

The Load Table step now supports the ability to load data into a Snowflake, Azure Synapse, or Singlestore target table. Read more

New Merge Table Step

You can use the Merge Table step to make changes to columns in a target table based on values from a source table. Rows in the source and target columns are matched using one or more key columns. The Merge Table step enables you to combine update and insert operations in one step. Read more

Python Program Step: Referenced Program Files Are Now Available in the Python Program Step

In a Python Program node, your Python program can either be embedded in the flow or reference an external program file. An externally referenced program is saved in an external location such as a SAS Content or SAS server folder. Read more

SAS Program Step: Referenced Program Files Are Now Available in the SAS Program Step

In a SAS Program node, your SAS program can either be embedded in the flow or reference an external program file. An externally referenced program is saved in an external location such as a SAS Content or SAS server folder. Read more

New Steps: Verify Addresses, Phone Numbers, and Email Addresses

You can now connect SAS to the Loqate API. The Verify & Geocode Addresses - Loqate step enables you to verify address information and obtain geocode coordinates from the Loqate Verify Address API. The Verify Phone Numbers - Loqate step enables you to verify phone numbers from the Loqate Verify Phone Numbers API. The Verify Email Addresses - Loqate step enables you to verify email addresses by using the Loqate Verify Email Addresses API. Read more

Custom Steps

Access Custom Steps from Your SAS Server

You can now access custom steps that are saved to your SAS Server. You can also access custom steps that are saved to your local network, Git, or shared mounted system within SAS Studio. Read more

Working with Stand-Alone Custom Steps

You can now run a custom step in a stand-alone tab in the SAS Studio workspace. Read more

Creating Cascading Prompts

In custom steps, you can use prompt hierarchies to create data dependencies between controls. The new Cascading Prompts sample task helps show how you can use cascading prompts in your custom tasks. Read more

New Color Picker Control

The color picker control enables step users to select a color in a custom step. Custom steps are available if you license SAS Studio Analyst or SAS Studio Engineer. Read more

Migrating Custom Tasks to Custom Steps (Experimental)

A migration tool is available so that you can convert your custom tasks from previous releases of SAS Studio to custom steps.

General Enhancements

- The ODS statements, %LET statements, and any other code that is automatically generated by SAS are now included in a collapsed region in both stand-alone and flow log files. You can view the automatically generated code by expanding the appropriate region in the log file. The **Show generated SAS code in the SAS log** option has been removed from the Code and Log preferences.
- You can sort columns in the Libraries pane by ascending, descending, or data order. By default, the columns are sorted in data order. For more information, see "Working with Library Connections" in *SAS Studio: User's Guide*.
- The log for background submissions now includes regions for the autoexec, preamble, and postamble code. The regions are collapsed by default.

A Public API Is Now Available

A public API is now available to identify a SAS program or flow and return the SAS code that is generated by the program or flow. The API includes options to specify whether to include the code that SAS Studio generates automatically.

LTS 2022.1 (May 2022)

SAS Studio Engineer Is Now Available

SAS Studio Engineer includes all the functionality in SAS Studio, SAS Studio Analyst, and advanced data management steps for the data engineer or ETL developer. Read more

Changes to Application Themes

- The Inspire application theme has been removed. If a user previously selected the Inspire theme, the default application theme is displayed the next time they sign in to the SAS Viya platform.
- The following application themes have been renamed:
  - The Illuminate theme is now called the Light theme.
  - The Ignite theme is now called the Dark theme.

For more information, see "Creating Global Settings" in *SAS Studio: User's Guide*.

Customizing Your Start-Up with a Workspace Configuration File

You can create a workspace configuration file so that your SAS Studio session starts with one or more open files. Read more

Custom Steps

New File or Folder Selector (path) Control

The file or folder selector (path) control enables users to specify the file or folder path that you want to use in the custom step. The specified path must be in a URL format. The path must include whether the file or folder is in SAS Content or on the SAS server. Read more

New List Control

The list control enables you to select multiple items from a list of values. Using the list control, you can now create two types of lists. A static list is populated with a predefined set of values. A dynamic list is populated with a set of values from a selected column. The user can select this column at run time, so the list of values changes based on user input. Read more

Create a Dynamic Drop-Down List

Using the drop-down list control, you can now create two types of drop-down lists. A static drop-down list is populated with a predefined set of values. A dynamic drop-down list is populated with a set of values from a selected column. The user can select this column at run time, so the list of values changes based on user input. Read more

Copy and Paste Available in the Designer Workspace

You can now copy and paste controls within the same Designer workspace or between Designer workspaces. For more information, see "Using the Design Tab to Add Controls" in *SAS Studio: Working with Custom Steps*.

New Execute Decisions Step

You can use the Execute Decisions step to add a published decision from SAS Intelligent Decisioning to your flow. Decisions enable you to create a database of

rules, combine those rules into decisions, and publish the decisions for use by other applications such as SAS Studio. To use a decision in SAS Studio, the input table must be a CAS table. The output table can be either a CAS table or a SAS table. This step is available only from SAS Studio Engineer. Read more

New Load Table Step

The Load Table step enables you to load a source table into a target table. When you use the Load Table step, you can control how data is loaded into the target table. You can choose to insert new source rows into the target table, update existing rows in the target table, or both. You can also control how existing rows in the target table are removed before new rows are inserted. This step is available only from SAS Studio Engineer. Read more

Flows

Advanced Options for Output Tables in a Flow

You can now specify additional options to apply when an output table in your flow is created or updated. The syntax for the advanced options can vary depending on the code that is generated for the step. Often, the advanced options are used to improve performance. Read more

New Options for CAS Output Data in a Flow

If you are running an operational node that creates CAS output data, you can specify whether the table is a session-scope table or a global-scope table, and you can save the table to the CAS server.

Flow Notes

You can annotate your flow by adding notes to the flow canvas. Notes that are added to the flow are not associated with a specific node. Read more

Flow Node Notes

You can add notes to a specific node in a flow by using the Note tab in the node details. When you add a note to a node, a note icon is displayed with the node on the flow canvas. Read more

General Enhancements

Running a Region of Code

You can run a region of code in a SAS program. Regions of code are identified in the code editor as blocks of code that can be collapsed and expanded. Read more

Sorting Output Data Sets in Creation Order

You can use the **Sort output data sets in creation order** option to sort your output data sets in the order in which they were created. This option is selected by default and can affect your performance if you are generating a large number of output data sets. If you clear this option, the output data sets can be sorted only in ascending or descending order. For more information, see "Specifying General Settings" in *SAS Studio: User's Guide*.

Displaying Labels on the Application Navigation Pane

You can use the new **Display labels on application navigation pane** option to display labels on the application navigation pane in addition to the icons. For more information, see "Specifying General Settings" in *SAS Studio: User's Guide*.

2022.1.4 (August 2022)

Custom Steps

New Color Picker Control

The color picker control enables step users to select a color in a custom step. Custom steps are available if you license SAS Studio Analyst or SAS Studio Engineer. Read more

2022.1.3 (July 2022)

Custom Steps

Access Custom Steps from Your SAS Server

You can now access custom steps that are saved to your SAS Server. You can also access custom steps that are saved to your local network, Git, or shared mounted system within SAS Studio. Read more

Working with Stand-Alone Custom Steps

You can now run a custom step in a stand-alone tab in the SAS Studio workspace. Read more

Creating Cascading Prompts

In custom steps, you can use prompt hierarchies to create data dependencies between controls. The new Cascading Prompts sample task helps show how you can use cascading prompts in your custom tasks. Read more

New Verify Email Address Step

You can now connect SAS to the Loqate API. The Verify Email Addresses - Loqate step enables you to verify email addresses by using the Loqate Verify Email Addresses API. Read more

Load Table Step: Support for Creating a Physical Table with the Upsert Rows Technique

When you are loading data that uses the Upsert Rows technique, you can now choose to automatically create a physical target table if one does not exist. For more information, see Load Table Step: Loading Rows from a Source Table into a Target Table in *SAS Studio: User's Guide*.

2022.1.2 (June 2022)

New Verify Addresses and Phone Information Steps

You can now connect SAS to the Loqate API. The Verify & Geocode Addresses - Loqate step enables you to verify address information and obtain geocode coordinates from the Loqate Verify Address API. The Verify Phone Numbers - Loqate step enables you to verify phone numbers from the Loqate Verify Phone Numbers API. Read more

New Merge Table Step

You can use the Merge Table step to make changes to columns in a target table based on values from a source table. Rows in the source and target columns are matched using one or more key columns. The Merge Table step enables you to combine update and insert operations in one step. Read more

Referenced Program Files Are Now Available in the Python Program Step

In a Python Program node, your Python program can either be embedded in the flow or reference an external program file. An externally referenced program is saved in an external location such as a SAS Content or SAS server folder. Read more

Subflows

You can create a subflow by adding a saved flow to your flow. A subflow can be useful if you have a group of nodes that you want to use in multiple locations. You can also use a subflow to reduce the complexity of a flow. Read more

Load Table Step: Support for Singlestore

The Load Table step now supports the ability to load data into a Singlestore target table. Read more

Sorting Columns in the Libraries Section of the Navigation Pane

You can sort columns in the Libraries pane by ascending, descending, or data order. By default, the columns are sorted in data order. For more information, see "Working with Library Connections" in *SAS Studio: User's Guide*.

2022.1.1 (May 2022)

Referenced Program Files Are Now Available in the SAS Program Step

In a SAS Program node, your SAS program can either be embedded in the flow or reference an external program file. An externally referenced program is saved in an external location such as a SAS Content or SAS server folder. Read more

Load Table Step: Support for Snowflake and Azure Synapse

The Load Table step now supports the ability to load data into a Snowflake or Azure Synapse target table. Read more

Automatically Generated Code Is Now Included in Log Files

The ODS statements, %LET statements, and any other code that is automatically generated by SAS are now included in a collapsed region in both stand-alone and flow log files. You can view the automatically generated code by expanding the appropriate region in the log file. The **Show generated SAS code in the SAS log** option has been removed from the Code and Log preferences.

A Public API Is Now Available

A public API is now available to identify a SAS program or flow and return the SAS code that is generated by the program or flow. The API includes options to specify whether to include the code that SAS Studio generates automatically.

LTS 2021.2 (November 2021)

New Progressive Web App Functionality

SAS Studio can be installed as a Progressive Web App (PWA), which enables you to use the product as a desktop app instead of in a web browser. Only Chromium-based browsers support PWA. For more information, see Installing SAS Studio as a Progressive Web App in *SAS Studio: User's Guide*.

Python Code Editor

SAS Studio now includes a color-coded editor for editing new or existing Python programs (*.py). With the Python code editor, you can write, run, and save Python programs without explicitly using PROC PYTHON. Many of the features that are available for SAS programs are also available for Python programs, including the ability to schedule a Python program and run a Python program as a job or a background submission. Read more

Custom Steps

A custom step enables you to create a user interface for users at your site to complete a specific task. Custom steps are saved to SAS Content so that they can be shared with others at your site.

The easiest way to create a custom step is to use the new Designer. If you are a programmer, you can write JSON code to create a step. For more information, see Working with Custom Steps.

Flows

Optimizing Performance

You can optimize the performance of your flow by combining the code generation of adjacent nodes. When you combine the code generation of the nodes, the table that is associated with the output port of the first node is not created.

The following step combinations can be optimized:

- Query node connected to an Insert Rows node
- Filter Rows node connected to a Sort node

For more information, see Optimizing Steps in a Flow.

Manage Columns Step

You can use the Manage Columns step to select a subset of columns from an input table and write the columns to an output table. You can also use the Manage Columns step to change the names, labels, and order of columns in the output table. The Manage Columns step can be combined with other steps in which you want to work with only a subset of the columns in a table. For more information, see Manage Columns Step: Subsetting Columns from an Input Table into an Output Table.

Calculate Columns Step

You can use the Calculate Columns step to create an output table that is based on the input table and can include replaced and new columns. By default, the output table includes all of the columns from the input table. You can replace columns in the output table by applying functions to the corresponding column in the input table. You can also create additional columns that are based on columns from the input table. Read more

New Python Program Step

You can use the Python Program step to add a Python program to your flow and run Python code without explicitly using PROC PYTHON. SAS Studio automatically uses your Python code to generate a SAS program by using PROC PYTHON. You can combine the Python Program step with other steps in a single flow. Read more

Import Fixed-Width Files

You can now import fixed-width files. You can use the new Load Structure functionality to load the column structure for a file from an external CSV or TXT file. Read more

Export Fixed-Width Files

You can now export data to a fixed-width file. You can automatically generate a CSV file that contains the column structure metadata for the exported file. Read more

Controlling the Submission Order of a Flow

You can control the execution order of your flow by grouping nodes into swimlanes and specifying the order in which the swimlanes are run. Read more

SAS Information Catalog and SAS Lineage Viewer Integration with Flows

SAS Studio flows are now automatically indexed in SAS Information Catalog and SAS Lineage Viewer. For more information, see SAS Information Catalog and SAS Lineage Viewer Integration.

Content Migration

- SAS Enterprise Guide built-in tasks, referenced programs, program nodes, query builder tasks, data nodes (for tables and registered tables in your metadata), the Append Tables task, the Filter and Sort task, and information map nodes are now supported for content migration.
- SAS Data Integration Studio jobs are now supported for content migration.

For more information, see Transitioning to SAS Studio.

Configuration Properties

- The `sas.studio.abandonedSessionTimeout` configuration property specifies the time-out for abandoned sessions in SAS Studio and on the SAS Compute Server. The default value is 5 minutes. For more information, see Configuration Properties for SAS Studio.
- The new `sas.studio.pwaSessionTimeout` configuration property enables you to specify a time-out when you are running SAS Studio as a Progressive Web App. For more information, see "SAS Studio as a Progressive Web App" in *SAS Studio: User's Guide*.

General Enhancements

- You can use the new **View output data in a pane** option to display the list of output data for programs, tasks, and flows in a collapsible pane. For more information, see Viewing Output Data.
- When you are specifying a format or informat for a column, the values are now filtered so that only valid formats and informats for the column data type are displayed. In addition, numeric formats and informats are now displayed by category: Numeric, Date, Time, Datetime, Currency, and User-defined.
- The Document Recovery feature now automatically saves flows. For more information, see "Using the Document Recovery Window" in *SAS Studio: User's Guide*.
- When you are creating a quick filter on data or adding a filter to a query, you can filter on formatted numeric values by clearing the **Use raw values** option. For more information, see "Creating a Quick Filter" in *SAS Studio: User's Guide* or "Creating a Filter" in *SAS Studio: User's Guide*.
- The Published Columns tab of table nodes includes a new **Edit structure** button. The **Edit structure** button enables you to add and delete columns and change the properties of existing columns in a table node. For more information, see About the Table Node.
- You can cut, copy, and paste nodes within a flow and between flows. When you cut or copy nodes, the properties and values that are associated with the nodes are retained. For more information, see Cutting, Copying, and Pasting Nodes.
- You can now access your recently opened items and items that you mark as favorites from the Start page. For more information, see Accessing Recently Opened and Favorite Items.
- You can use the overview map to view your entire flow in a small window on the flow canvas. For more information, see Using the Overview Map.
- You can rename files and folders in the Explorer section of the navigation pane. For more information, see Using the Explorer.

- When you create a library, you can test whether the connection to the new library is valid. For more information, see Working with Libraries.

2021.2.6 (April 2022)

Updated Libraries User Interface

You can now view both connected and disconnected libraries in the **Libraries** section of the navigation pane. The New Library Connection window has been updated. For more information, see "Working with Library Connections" in *SAS Studio: User's Guide*.

Git Authentication with Kerberos

You can now use Kerberos to authenticate with your Git repositories. For more information, see "About Git Integration in SAS Studio" in *SAS Studio: User's Guide*.

Undo and Redo Functionality Is Now Available in Designer

In the Designer for custom steps, the undo and redo functionality is now available.

For accessibility, these keyboard shortcuts were added.

Table 3.1 *Keyboard Shortcuts in Designer for Undo and Redo Functionality*

Action	Keyboard Shortcut for Microsoft Windows	Keyboard Shortcut for Apple OS X
Undo an action in the Designer.	Ctrl+Z	Command+Z
Redo an action in the Designer.	Ctrl+Y	Command+Shift+Z

For more information, see "Using the Design Tab to Add Controls" in *SAS Studio: Working with Custom Steps*.

2021.2.5 (March 2022)

Customizing Your Start-Up with a Workspace Configuration File

You can create a workspace configuration file so that your SAS Studio session starts with one or more open files. Read more

Create a Dynamic List

Using the list control, you can now create two types of lists. A static list is populated with a predefined set of values. A dynamic list is populated with a set of values from a selected column. The user can select this column at run time, so the list of values changes based on user input. Read more

Changes to Application Themes

- The Inspire application theme has been removed. If a user previously selected the Inspire theme, the default application theme is displayed the next time they sign in to the SAS Viya platform.
- The following application themes have been renamed:
  - The Illuminate theme is now called the Light theme.
  - The Ignite theme is now called the Dark theme.

2021.2.4 (February 2022)

Load Table

The Load Table step enables you to load a source table into a target table. When you use the Load Table step, you can control how data is loaded into the target table. You can choose to insert new source rows into the target table, update existing rows in the target table, or both. You can also control how existing rows in the target table are removed before new rows are inserted. Read more

Flow Notes

You can annotate your flow by adding notes to the flow canvas. Notes that are added to the flow are not associated with a specific node. Read more

Flow Node Notes

You can add notes to a specific node in a flow by using the Note tab in the node details. When you add a note to a node, a note icon is displayed with the node on the flow canvas. Read more

General Enhancements

The custom step documentation has been moved from *SAS Studio: User's Guide* to the new *SAS Studio: Working with Custom Steps*.

2021.2.3 (January 2022)

Custom Steps

New List Control

The list control enables you to select multiple items from a list of values. Read more

Create a Dynamic Drop-Down List

Using the drop-down list control, you can now create two types of drop-down lists. A static drop-down list is populated with a predefined set of values. A dynamic drop-down list is populated with a set of values from a selected column. The user can select this column at run time, so the list of values changes based on user input. Read more

Copy and Paste Available in the Designer Workspace

You can now copy and paste controls within the same Designer workspace or between Designer workspaces. For more information, see Using the Designer to Add Controls.

2021.2.2 (December 2021)

SAS Studio Engineer Is Now Available

SAS Studio Engineer includes all the functionality in SAS Studio, SAS Studio Analyst, and advanced data management steps for the data engineer or ETL developer. Read more

New Execute Decisions Step

You can use the Execute Decisions step to add a published decision from SAS Intelligent Decisioning to your flow. Decisions enable you to create a database of rules, combine those rules into decisions, and publish the decisions for use by other applications such as SAS Studio. To use a decision in SAS Studio, the input table must be a CAS table. The output table can be either a CAS table or a SAS table. This step is available only from SAS Studio Engineer. Read more

Advanced Options for Output Tables in a Flow

You can now specify additional options to apply when an output table in your flow is created or updated. The syntax for the advanced options can vary depending on the code that is generated for the step. Often, the advanced options are used to improve performance. Read more

New Options for CAS Output Data in a Flow

If you are running an operational node that creates CAS output data, you can specify whether the table is a session-scope table or a global-scope table, and you can save the table to the CAS server. Read more

General Enhancements

You can use the new **Display labels on application navigation pane** option to display labels on the application navigation pane in addition to the icons. For more information, see "Specifying General Settings" in *SAS Studio: User's Guide*.

2021.2.1 (November 2021)

Custom Steps: New File or Folder Selector (path) Control

The file or folder selector (path) control enables users to specify the file or folder path that you want to use in the custom step. The specified path must be in a URL format. The path must include whether the file or folder is in SAS Content or on the SAS server. Read more

General Enhancements

Running a Region of Code

You can run a region of code in a SAS program. Regions of code are identified in the code editor as blocks of code that can be collapsed and expanded. Read more

Sorting Output Data Sets in Creation Order

You can use the **Sort output data sets in creation order** option to sort your output data sets in the order in which they were created. This option is selected by default and can affect your performance if you are generating a large number of output data sets. If you clear this option, the output data sets can be sorted only in ascending or descending order. For more information, see "Specifying General Settings" in *SAS Studio: User's Guide*.

LTS 2021.1 (May 2021)

Content for 2021.1

The 2021.1 long-term support release is based on the 2020.1.4 stable release. It includes all features in the stable releases 2020.1.1 through 2020.1.4.

SAS Studio Licenses

SAS Studio is currently available in two licenses. To determine your license, see the About box for SAS Studio. SAS Studio is the base product with a set of foundational features. SAS Studio (Analyst) contains the base product and some additional features.

For more information, see "What Version of SAS Studio Are You Running?" in *SAS Studio: Administrator's Guide*.

Critical Changes

- Any file that is referenced by a File node must be located in SAS Content or on the file system for the current SAS Compute Server.
- On all the SAS Compute Servers that are launched, LOCKDOWN is enabled by default. This lockdown functionality enables you to limit access to files and specific SAS features. For more information, see Understanding the Lockdown Functionality on the SAS Compute Server

Flows

New Insert Rows Step

In flows, you can use the Insert Rows step to insert the rows from an input table into an output table. All of the columns in the output table must have corresponding columns in the input table with matching names and data types. SAS

Studio automatically generates PROC SQL or PROC FEDSQL code when the step is run.

The Insert Rows step enables you to add rows to an output table in any of the following ways:

- append the rows in the input table to existing rows in the output table
- replace the existing rows in the output table with the rows from the input table
- add the rows from the input table to a new output table

For more information, see Insert Rows Step: Insert Rows from an Input Table into an Output Table in *SAS Studio: User's Guide*.

Note: The Insert Rows step is available only if your site licenses SAS Studio Analyst.

New Branch Rows Step

The Branch Rows step splits a table into two output tables based on conditions that you specify by using column values. The conditions that you create do not need to be mutually exclusive: a row can be written to more than one output table. For more information, see Branch Rows Step: Split an Input Table into Output Tables in *SAS Studio: User's Guide*.

Note: The Branch Rows step is available only if your site licenses SAS Studio Analyst.

New Filter Rows Step

In flows, you can use the Filter Rows step to select a subset of rows from an input table and write the rows to an output table. The Filter Rows step can be combined with other steps in which you want to work with only a subset of the data in a table. For example, you can create a flow that uses the Filter Rows step to create a table that contains only baseball players who have had more than 10 home runs, and then you can use the Branch Rows step to split the filtered data into separate tables for each team.

For more information, see Filter Rows Step: Subsetting Rows from an Input Table into an Output Table in *SAS Studio: User's Guide*.

Note: The Filter Rows step is available only if your site licenses SAS Studio Analyst.

General Enhancements

The following functionality was added to flows:

- You can convert a SAS program file to a flow. The input tables, procedures, and output tables in the program are used to create nodes in the flow.
- Use the Export node to save data to an external text file, a delimited file, or a Microsoft Excel file. For more information, see Exporting Data to an External File in *SAS Studio: User's Guide*.
- By default, the flow properties are collapsed on the right side of the canvas. When you expand the Properties pane, you can edit the Description property to specify information about the flow.
- Depending on the file type, the File node options enable you to download and view the file and update some of the data that is associated with the node. For more information, see Adding an External File to a Flow in *SAS Studio: User's Guide*.

Global Shortcuts

SAS Studio administrators can use the new `globalShortcuts` configuration property in SAS Environment Manager to create global shortcuts for users at their site. These shortcuts to the file system or SAS Content appear in the **Explorer** pane in SAS Studio. For more information, see "Configuring Global Folder Shortcuts" in *SAS Studio: Administrator's Guide*.

General Enhancements

- In the New Library window, the **Preassign library for all users of the current compute context** option has been renamed **Make data sources available to all users**.
- The Document Recovery feature now automatically saves additional file types, including queries and tasks. For more information, see "Using the Document Recovery Window" in *SAS Studio: User's Guide*.
- You can now specify a format for a column in a stand-alone query that is generated using PROC FEDSQL. For more information, see "Generating a FedSQL Query" in *SAS Studio: User's Guide*.

2021.1.6 (October 2021)

New Python Program Step

You can use the Python Program step to add a Python program to your flow and run Python code without explicitly using PROC PYTHON. SAS Studio automatically uses your Python code to generate a SAS program by using PROC PYTHON. You can combine the Python Program step with other steps in a single flow. Read more

General Enhancements

The new `sas.studio.pwaSessionTimeout` configuration property enables you to specify a time-out when you are running SAS Studio as a Progressive Web App. For more information, see "SAS Studio as a Progressive Web App" in *SAS Studio: User's Guide*.

2021.1.5 (September 2021)

Custom Steps

Updates to Sample Controls

The Sample controls now include examples for the numeric stepper control, the radio group control, and the new column control. Read more

New Column Control

Use the new column control to enable users to add a column in a custom step. Read more

New Sample Step: Define Column Structure - Advanced

The Define Column Structure - Advanced step shows you how you can define the column structure for the output port for a custom step. Read more

Flows

New Calculate Columns Step

You can use the Calculate Columns step to create an output table that is based on the input table and can include replaced and new columns. By default, the output table includes all of the columns from the input table. You can replace columns in the output table by applying functions to the corresponding column in the input table. You can also create additional columns that are based on columns from the input table. Read more

Export Fixed-Width Files

You can now export data to a fixed-width file. You can automatically generate a CSV file that contains the column structure metadata for the exported file. Read more

SAS Information Catalog and SAS Lineage Viewer Integration with Flows

SAS Studio flows are now automatically indexed in SAS Information Catalog and SAS Lineage Viewer. For more information, see SAS Information Catalog and SAS Lineage Viewer Integration.

Python Code Editor

SAS Studio now includes a color-coded editor for editing new or existing Python programs (*.py). With the Python code editor, you can write, run, and save Python

programs without explicitly using PROC PYTHON. Many of the features that are available for SAS programs are also available for Python programs, including the ability to schedule a Python program and run a Python program as a job or a background submission. Read more

Configuration Property for Abandoned Sessions

The `sas.studio.abandonedSessionTimeout` configuration property specifies the time-out for abandoned sessions in SAS Studio and on the SAS Compute Server. The default value is 5 minutes. For more information, see Configuration Properties for SAS Studio.

General Enhancements

When you create a library, you can test whether the connection to the new library is valid. For more information, see Working with Libraries.

2021.1.4 (August 2021)

Custom Steps

numstepper Control

The numstepper controls enables you to specify the step interval for the customer control. Read more

Define the Column Structure for the Output Port in a Custom Step

You can define the column structure for the output table of a custom step. By defining the column structure, the user of the step knows which columns are available to any nodes upstream in the flow, without running the step to generate the output table. Read more

Flows

Import Fixed-Width Files

You can now import fixed-width files. You can use the new Load Structure functionality to load the column structure for a file from an external CSV or TXT file. Read more

Controlling the Submission Order of a Flow

You can control the execution order of your flow by grouping nodes into swimlanes and specifying the order in which the swimlanes are run. Read more

General Enhancements

You can rename files and folders in the Explorer section of the navigation pane. For more information, see Using the Explorer.

2021.1.3 (July 2021)

New Designer for Custom Steps

The easiest way to create a custom step is to use the new Designer. If you are a programmer, you can still write the JSON code to create a step. For more information, see Create a Custom Step.

Custom Step Enhancements

- You can add a custom step to your list of favorites.
- From the Explorer pane, you can view a custom step file as text. For more information, see View a Custom Step File as Text.

- You might have downloaded or saved a custom step file to your local computer. To edit the step and use the step in your flow, you must upload the file to SAS Content in SAS Studio. For more information, see Upload a Custom Step to SAS Content.
- To save a version of your custom step or to share the file with others, you might want to download the custom step file to your local computer. For more information, see Download a Custom Step to Your Local Computer.

General Enhancements

- You can now access your recently opened items and items that you mark as favorites from the Start page. For more information, see Accessing Recently Opened and Favorite Items.
- You can use the overview map to view your entire flow in a small window on the flow canvas. For more information, see Using the Overview Map.

2021.1.2 (June 2021)

New Progressive Web App Functionality

SAS Studio can now be installed as a Progressive Web App (PWA), which enables you to use the product as a desktop app instead of in a web browser. Only Chromium-based browsers support PWA. For more information, see Installing SAS Studio as a Progressive Web App in *SAS Studio: User's Guide*.

Custom Steps

- Dependencies enable the step author to specify the state of the prompt based on the values of other prompts. For more information, see Understanding Dependencies.
- Use the new `visible` property to specify whether a prompt is visible or hidden. For more information, see Common Prompt and Layout Properties.

Flows: General Enhancements

You can cut, copy, and paste nodes within a flow and between flows. When you cut or copy nodes, the properties and values that are associated with the nodes are retained. For more information, see Cutting, Copying, and Pasting Nodes.

2021.1.1 (May 2021)

Flows: Manage Columns Step

You can use the Manage Columns step to select a subset of columns from an input table and write the columns to an output table. You can also use the Manage Columns step to change the names, labels, and order of columns in the output table. The Manage Columns step can be combined with other steps in which you want to work with only a subset of the columns in a table. For more information, see Manage Columns Step: Subsetting Columns from an Input Table into an Output Table.

Flows: General Enhancements

The Published Columns tab of table nodes includes a new **Edit structure** button. The **Edit structure** button enables you to add and delete columns and change the properties of existing columns in a table node. For more information, see About the Table Node.

Content Migration

- SAS Enterprise Guide built-in tasks, referenced programs, program nodes, query builder tasks, data nodes (for tables and registered tables in your metadata), the Append Tables task, the Filter and Sort task, and information map nodes are now supported for content migration.
- SAS Data Integration Studio jobs are now supported for content migration.

For more information, see Transitioning to SAS Studio.

LTS 2020.1 (November 2020)

Critical Changes

- When you initially install SAS Studio, the file system is temporary, so users do not see a file system in the **Explorer** section of the navigation pane. The SAS Studio administrator and the Kubernetes administrator need to create persistent file storage.
- In this release of SAS Studio, the context root has changed from StudioV to Studio. Therefore, your site's URL uses Studio rather than StudioV.

Queries

You can now select and move multiple adjacent columns on the **Select**, **Filter**, and **Sort** tabs of your query.

Libraries

You can edit libraries that you have created by right-clicking the library and selecting **Edit library**. For more information, see "Working with Library Connections" in *SAS Studio: User's Guide*.

Flows

Flows are a metadata-driven design tool that support a sequence of operations on data using nodes to represent the data and operations. Nodes are created by adding "steps" to your flow.

Flows are designed to enable you to manage complex processes by creating a generalized flow of data without hardcoding references to tables, columns, and operations ahead of time. You can update the specific attributes of any node in the flow by using the node properties. Ports represent the input source and output target of an operation node and can be accessed programmatically by the macro variables that are associated with each port. Nodes and ports can be used to

provide metadata-based definitions of data and operations so that you have greater flexibility in defining the content of your flow.

The types of nodes that are available to use in a flow can be accessed from the **Steps** section of the navigation pane. As the nodes become available, additional steps are added to the **Steps** section with each new release of SAS Studio.

For more information, see Working with Flows in *SAS Studio: User's Guide*.

SAS Tasks

- In the Econometrics category, the Aggregate Loss Models task is new. The Aggregate Loss Models task computes an estimate of the probability distribution model of the aggregate loss. This estimate is based on the knowledge of the distribution of loss count and loss severity. For more information, see "Aggregate Loss Models" in *SAS Studio: Task Reference Guide*.
- If you develop SAS tasks, note these changes:
  - In the `Tasks` element, the `revision` attribute is new. Task authors are responsible for maintaining this value.
  - In the `Registration` element, the `Version` element is deprecated.

General Enhancements

- In this release of SAS Studio, the import functionality that was available in previous releases is now called Quick import. An Import node has also been added to the flow functionality in this release.
- Snippets are now available for many SAS Data Quality functions. For more information, see "Working with Snippets" in *SAS Studio: User's Guide*.
- If you have access to more than one compute context, you can change the context that SAS Studio uses. For more information, see "Changing Your Compute Context" in *SAS Studio: User's Guide*.
- You can switch between using PROC SQL and PROC FEDSQL in a new or existing query. For more information, see "Generating a FedSQL Query" in *SAS Studio: User's Guide*.
- You can now refresh a single library or table in the **Libraries** section of the navigation pane. For more information, see "Working with Library Connections" in *SAS Studio: User's Guide*.
- When you create or edit a library, you can specify the SAS library engine that you want to use. The library engines that are available depend on your deployment. For more information, see "Working with Library Connections" in *SAS Studio: User's Guide*.
- There are several updates to the Submission Status window:

- You can now view the server context in which the item was run.
- You can subset items by submission status.
- You can specify filter criteria for the Name column.

For more information, see "Using the Submissions and Job Status Tab" in *SAS Studio: User's Guide*.

2020.1.5 (April 2021)

Flows: Custom Steps

A custom step enables you to create a user interface for users at your site to complete a specific task. Custom steps are saved to SAS Content so that they can be shared with others at your site.

SAS Studio provides a Custom Step Editor that you can use to quickly create a custom step for your site. For more information, see Working with Custom Steps.

Flows: General Enhancements

You can optimize the performance of your flow by combining the code generation of adjacent nodes. When you combine the code generation of the nodes, the table that is associated with the output port of the first node is not created.

In SAS Studio 2020.1.5, the following step combinations can be optimized:

- Query node connected to an Insert Rows node
- Filter Rows node connected to a Sort node

For more information, see Optimizing Steps in a Flow.

General Enhancements

- You can use the new **View output data in a pane** option to display the list of output data for programs, tasks, and flows in a collapsible pane. For more information, see Viewing Output Data.
- When you are specifying a format or informat for a column, the values are now filtered so that only valid formats and informats for the column data type are displayed. In addition, numeric formats and informats are now displayed by category: Numeric, Date, Time, Datetime, Currency, and User-defined.

- The Document Recovery feature now automatically saves flows. For more information, see "Using the Document Recovery Window" in *SAS Studio: User's Guide*.
- When you are creating a quick filter on data or adding a filter to a query, you can filter on formatted numeric values by clearing the **Use raw values** option. For more information, see "Creating a Quick Filter" in *SAS Studio: User's Guide* or "Creating a Filter" in *SAS Studio: User's Guide*.

2020.1.4 (March 2021)

Critical Changes

On all the SAS Compute Servers that are launched, LOCKDOWN is enabled by default. This lockdown functionality enables you to limit access to files and specific SAS features. For more information, see "Understanding the Lockdown Functionality on the SAS Compute Server" in *SAS Studio: Administrator's Guide*. .

Global Shortcuts

SAS Studio administrators can use the new `globalShortcuts` configuration property in SAS Environment Manager to create global shortcuts for users at their site. These shortcuts to the file system or SAS Content appear in the **Explorer** pane in SAS Studio. For more information, see "Configuring Global Folder Shortcuts" in *SAS Studio: Administrator's Guide*.

Migration of SAS Enterprise Guide Projects

SAS Enterprise Guide projects can be migrated to SAS Studio. All SAS Enterprise Guide nodes are converted to SAS Studio program nodes.

General Enhancements

You can now specify a format for a column in a stand-alone query that is generated using PROC FEDSQL. For more information, see "Generating a FedSQL Query" in *SAS Studio: User's Guide*.

2020.1.3 (February 2021)

New Filter Rows Step

In flows, you can use the Filter Rows step to select a subset of rows from an input table and write the rows to an output table. The Filter Rows step can be combined with other steps in which you want to work with only a subset of the data in a table. For example, you can create a flow that uses the Filter Rows step to create a table that contains only baseball players who have had more than 10 home runs, and then you can use the Branch Rows step to split the filtered data into separate tables for each team.

For more information, see Filter Rows Step: Subsetting Flows from an Input Table into an Output Table in *SAS Studio: User's Guide*.

Note: The Filter Rows step is available only if your site licenses SAS Studio Analyst.

General Enhancements

The Document Recovery feature now automatically saves additional file types, including queries and tasks. For more information, see "Using the Document Recovery Window" in *SAS Studio: User's Guide*.

2020.1.2 (January 2021)

SAS Studio Licenses

SAS Studio is currently available in two licenses. To determine your license, see the About box for SAS Studio. SAS Studio is the base product with a set of foundational features. SAS Studio (Analyst) contains the base product and some additional features.

For more information, see "What Version of SAS Studio Are You Running?" in *SAS Studio: Administrator's Guide*.

New Insert Rows Step

In flows, you can use the Insert Rows step to insert the rows from an input table into an output table. All of the columns in the output table must have corresponding columns in the input table with matching names and data types. SAS Studio automatically generates PROC SQL or PROC FEDSQL code when the step is run.

The Insert Rows step enables you to add rows to an output table in any of the following ways:

- append the rows in the input table to existing rows in the output table
- replace the existing rows in the output table with the rows from the input table
- add the rows from the input table to a new output table

For more information, see Insert Rows Step: Insert Rows from an Input Table into an Output Table in *SAS Studio: User's Guide*.

Note: The Insert Rows step is available only if your site licenses SAS Studio Analyst.

General Enhancements

In the New Library window, the **Preassign library for all users of the current compute context** option has been renamed **Make data sources available to all users**.

2020.1.1 (December 2020)

Critical Changes

Any file that is referenced by a File node must be located in SAS Content or on the file system for the current SAS Compute Server.

Flows

New Branch Rows Step

The Branch Rows step splits a table into two output tables based on conditions that you specify by using column values. The conditions that you create do not need to be mutually exclusive: a row can be written to more than one output table. For more information, see Branch Rows Step: Split an Input Table into Output Tables in *SAS Studio: User's Guide*.

Note: The Branch Rows step is available only if your site licenses SAS Studio Analyst.

General Enhancements

The following functionality was added to flows:

- You can convert a SAS program file to a flow. The input tables, procedures, and output tables in the program are used to create nodes in the flow.
- Use the Export node to save data to an external text file, a delimited file, or a Microsoft Excel file. For more information, see Exporting Data to an External File in *SAS Studio: User's Guide*.
- By default, the flow properties are collapsed on the right side of the canvas. When you expand the Properties pane, you can edit the Description property to specify information about the flow.
- Depending on the file type, the File node options enable you to download and view the file and update some of the data that is associated with the node. For more information, see Adding an External File to a Flow in *SAS Studio: User's Guide*.