About Report Objects

After selecting your data source and data items, add one or more report objects to display the results. SAS Visual Analytics provides report objects for all of your reports. (You can also select data after you add report objects to the canvas.) Report objects are grouped into types in the Objects pane: Tables, Graphs, Controls, Analytics, and Other (which includes containers, images, text, and web content).


For a definition and picture of each report object, see “Gallery of Report Objects” in SAS Visual Analytics: Reference.

Basic Report Object Tasks

Insert a Report Object into a Report

To insert a report object into a report, choose one of the following methods:

- Drag the report object from the Objects pane, and drop it onto the canvas. For more information, see “About the Canvas” in SAS Visual Analytics: Designing Reports.
  
  **TIP** To insert multiple report objects, select the check box for each of the objects that you want to add, and then drag any of the selected objects onto the canvas.

- Double-click the report object in the Objects pane. The report object is automatically placed in the canvas. If you want the report object to appear in a different location, then drag and drop it in a new location.

Additional steps are required for some report objects.

- If you insert a container, then you can drag and drop other report objects onto the container.
Inserting images requires additional steps. For more information, see Insert an Image into a Report on page 42.

**Duplicate a Report Object**

Duplicating a report object in SAS Visual Analytics enables you to use a copy of the same object on the same page or on another page of your report.

**Note:** If you duplicate a control with a parameter, the parameter is not copied from the original control because the parameter gets its value from only one control.

To duplicate a report object:

1. On the canvas, position your mouse pointer over the button for the report object that you want to duplicate, click the drop-down list, and then select **Duplicate**.

   The duplicated report object is placed on the canvas with a name based on the original name. For example, if the original report object name is List Table 1, then the duplicate report object is displayed as List Table 1 (1). If you choose to duplicate the same report object again, then it is displayed as List Table 1 (2).

2. **(Optional)** Move the duplicate report object to another page. Using the **Outline** pane, click and drag the indicator to move the duplicate report object.

3. **(Optional)** If you want the report object to appear in a different location on the page, then drag and drop it in a new location.

   If you move an object to a page with precision layout, then you must manually move the object to its proper location. All objects are put in the top left corner by default.

**Change a Report Object’s Type**

You can change a report object’s type after you have placed the object on the canvas. For example, you might want to change a pie chart to a bar chart once you see how it looks in your report.

On the canvas, position your mouse pointer over the button for the report object that you want to change, click ![ ]( ), and then select **Use automatic content** or a specific object that you want in your report.

**TIP** Click **More** to see additional report object types.

SAS Visual Analytics attempts to keep the original report object’s display rules, filters, and ranks. It also attempts to assign data roles appropriately for the new report object type. However, if it cannot keep the original report object’s display rules, filters, or ranks, a message is displayed. SAS Visual Analytics does not attempt to keep any options, and it does not display a message when options are discarded.

**TIP** Click ![ ]( ) to restore the original report object and all of its settings, including the options and other items that were discarded.
Using the Options Pane for Report Objects

Specify Options for a Report Object

1. Select the report object in the canvas that you want to update.
2. If the **Options** pane is not already displayed, click ![Options](options_icon.png).
3. Specify the specific options for the report object type. In general, the options that are specific to the current object type are expanded by default.
4. Specify the general options for report objects. Depending on the report object type, some of the following options are available:

<table>
<thead>
<tr>
<th>Grouping</th>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>Name</td>
<td>specifies the name of the object. The name is used to identify the object in the <strong>Outline</strong> pane and in the <strong>Actions</strong> pane. The name must be unique within the report.</td>
</tr>
<tr>
<td></td>
<td>Title</td>
<td>specifies a title that is displayed at the top of the object. If you double-click the title in the object, then you can edit the title and change style options.</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>specifies a description for the object. If <strong>Enable selection in the viewers</strong> is selected, then the description is displayed in the web viewer or mobile app when the user selects <img src="selection_icon.png" alt="Selection" />.</td>
</tr>
<tr>
<td></td>
<td>Font</td>
<td>specifies the font that is used for all of the text in the object.</td>
</tr>
<tr>
<td></td>
<td>Enable selection in the viewers</td>
<td>enables users who use the web viewer or a mobile device to select the object, and click <img src="selection_icon.png" alt="Selection" /> to see the name, description, any incoming filter information.</td>
</tr>
<tr>
<td>Grouping</td>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Background</td>
<td>Background</td>
<td>displays a background for the object and enables you to specify the color</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and transparency of the background.</td>
</tr>
<tr>
<td></td>
<td>Border</td>
<td>displays a border around the object and enables you to specify the thickness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and transparency of the border.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: A border is always displayed for an object that is currently selected.</td>
</tr>
<tr>
<td></td>
<td>Padding</td>
<td>specifies the amount of empty space to display around the sides of the object.</td>
</tr>
<tr>
<td>Graph Frame</td>
<td>Data skin</td>
<td>specifies the visual style of the data elements in the object (for example,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>style of the bars in a bar chart).</td>
</tr>
<tr>
<td></td>
<td>Data tip text style</td>
<td>specifies the font size and color of the data tip text.</td>
</tr>
<tr>
<td></td>
<td>Data tip background style</td>
<td>specifies the color of the background for data tips.</td>
</tr>
<tr>
<td></td>
<td>Show grid lines</td>
<td>displays grid lines for each tick on the axes and enables you to set the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>thickness and color of the lines.</td>
</tr>
<tr>
<td></td>
<td>Wall Background</td>
<td>specifies the color and transparency of the background for the graph wall.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The wall is the area that is bounded by the graph axes.</td>
</tr>
<tr>
<td></td>
<td>Header Background</td>
<td>specifies the color and transparency of the background for lattice headings.</td>
</tr>
<tr>
<td></td>
<td>Wall Background</td>
<td>specifies the color and transparency of the background for the graph wall.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The wall is the area that is bounded by the graph axes.</td>
</tr>
<tr>
<td>Grouping</td>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Axis Options</td>
<td>Fixed minimum</td>
<td>specifies a fixed minimum value for the axis.</td>
</tr>
<tr>
<td></td>
<td>Fixed maximum</td>
<td>specifies a fixed maximum value for the axis.</td>
</tr>
<tr>
<td></td>
<td>Rotate value label</td>
<td>displays the category tick values at an angle.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: The Rotate value label option has no effect if your report object displays a lattice.</td>
</tr>
<tr>
<td></td>
<td>Axis label</td>
<td>displays the axis label and enables you to set the text style for the label.</td>
</tr>
<tr>
<td></td>
<td>Axis line</td>
<td>displays the axis line and enables you to set the width and color of the line.</td>
</tr>
<tr>
<td></td>
<td>Tick values</td>
<td>displays the tick values along the axis and enables you to set the text style for the tick values.</td>
</tr>
<tr>
<td>Legend</td>
<td>Visibility</td>
<td>specifies whether the legend is displayed. If you select Automatic, then the legend is automatically hidden when the object is displayed at a small size. If you select Off, then the legend is always hidden.</td>
</tr>
<tr>
<td></td>
<td>Placement</td>
<td>specifies the position of the legend.</td>
</tr>
<tr>
<td></td>
<td>Background style</td>
<td>specifies the color and transparency of the background for the legend.</td>
</tr>
<tr>
<td></td>
<td>Border line style</td>
<td>specifies the thickness and color of the border around the legend.</td>
</tr>
<tr>
<td>Data Options</td>
<td>Combine excluded into “All Other”</td>
<td>See Use the Combine Excluded into “All Other” Option on page 6.</td>
</tr>
<tr>
<td>Grouping</td>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Layout</td>
<td>Specify width</td>
<td>if enabled, specifies the width of the object as a percentage of the space on the canvas. By default, SAS Visual Analytics automatically computes the width of any control or text object when the report is rendered. (This makes reports or text objects more portable across various screen sizes.) Use the <strong>Specify width</strong> option only if you want a control or text object to always be a fixed percentage of the report’s width on any screen.</td>
</tr>
<tr>
<td></td>
<td>Specify height</td>
<td>if enabled, specifies the height of the object as a percentage of the space on the canvas. By default, SAS Visual Analytics automatically computes the height of any control or text object when the report is rendered. (This makes reports or text objects more portable across various screen sizes.) Use the <strong>Specify height</strong> option only if you want a control or text object to always be a fixed percentage of the report’s height on any screen.</td>
</tr>
</tbody>
</table>

**Use the Combine Excluded into “All Other” Option**

The **Options** pane provides a data option for list tables and some graphs that you can use to combine content across categories (for example, the content that is formed by combining the report object’s visible categories). These options are frequently used with filters and ranks.

You can use the **Combine excluded rows into “All Other”** option for list tables or the **Combine excluded into “All Other”** option for some graphs.

The effect of these options can be influenced by certain types of actions. For example, if you have a list table with a Sales measure data item, the list table might have the **Combine excluded rows into “All Other”** option selected and be targeted by a slider showing a range of Sales figures. The category combinations that are dropped based on the range selected in the slider control are grouped into a category named “All Other.”

Here are some key points about the **Combine excluded rows into “All Other”** and the **Combine excluded into “All Other”** options:

- The **Combine excluded rows into “All Other”** option is not available for crosstabs.
- The **Combine excluded into “All Other”** option is not available for time series plots, bubble plots, scatter plots, step plots, needle plots, geo maps, or word clouds.

There is a similar, but distinct per-category “All Other” option that is provided for ranking in SAS Visual Analytics. For more information about the All Other concept for ranking, see “Ranking Values in Reports” in SAS Visual Analytics: Working with Report Data.

Here are some key points about the **Combine excluded rows into “All Other”** option and the **Combine excluded into “All Other”** option:

- The property cannot be set when the report object is displaying detail data.
The property cannot be set when the report object includes a rank with the per-category All Other option selected.

The property cannot be set for pie charts when the Create “Other” slice for minimal values property is selected.

The property cannot be set when a hierarchy is assigned to the report object.

---

**Viewing Report Objects in Explore Mode**

**About Explore Mode**

Explore mode enables you to view report objects—from any part of a report—all together. For example, you can place an object from the first page of your report side by side with an object from the fifth page to compare the two.

In addition, detail data for your report objects is visible in explore mode.

**Note:** Report object actions such as brushing are disabled in explore mode.

You can create new report objects in explore mode. Each new object is placed on a new page when you return to the standard reporting mode. By default, the new pages are hidden.

If you save your report while in explore mode, then the report opens in explore mode. Any layout changes are saved as long as the report remains in explore mode. Layout changes are discarded when you exit explore mode and return to the standard reporting mode. Any other changes (such as role assignments, filters, and display rules) are saved when you exit explore mode.

**Enter Explore Mode**

You can enter explore mode by:

- From the object toolbar, select the Explore button to explore that report object.

- From the Outline pane, select one or more report objects to explore, and then click the Explore button to explore the selected report objects.

**Note:** The Explore button is available only if tables or graphs are selected. If pages, controls, containers, or other content types are selected, then the Explore button is disabled.

**Exit Explore Mode**

To exit explore mode and return to your report, click the Explore button in the upper left corner of the workspace.

**Note:** Any layout changes that you made in explore mode are discarded when you return to the standard reporting mode.

**Manage Objects from the Outline Pane**

To manage the objects that are currently displayed in explore mode, open the Outline pane, and then select or deselect the Explore icon for each report object.
Working with Automatic Charts

About Automatic Charts

Automatic charts display different types of charts automatically based on the data items that are assigned to the chart.

To create an automatic chart, drag any data item onto the canvas of your report. Depending on the type of data item or data items that you select, the automatic chart can display different types of charts:

**Automatic Chart Types**

<table>
<thead>
<tr>
<th>Data Items</th>
<th>Chart Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>One measure</td>
<td>Histogram</td>
</tr>
<tr>
<td>One category</td>
<td>Bar chart</td>
</tr>
<tr>
<td>One datetime category and any number of other categories or measures</td>
<td>Time series plot</td>
</tr>
<tr>
<td>One geography and up to two measures</td>
<td>Geo map</td>
</tr>
<tr>
<td>One geography and three or more measures</td>
<td>Bar chart</td>
</tr>
<tr>
<td>Two measures</td>
<td>Scatter plot or Heat map</td>
</tr>
<tr>
<td>Three or more measures</td>
<td>Scatter plot or Correlation matrix</td>
</tr>
<tr>
<td>One or more categories and any number of measures and geographies</td>
<td>Bar chart</td>
</tr>
</tbody>
</table>

You can create automatic controls by dragging and dropping data items onto the report prompt area or the page prompt area of the canvas. For more information, see Working with Controls on page 14. If you drag and drop a hierarchy onto the report prompt area or the page prompt area, then a set of linked controls is created. Controls are created for each level of the hierarchy.

Note: The Roles pane for an automatic chart always contains Categories and Measures. It does not contain advanced data roles. To set roles such as grouping and lattices, switch the automatic chart to the specific type that is currently displayed. See Switch between Automatic Chart and a Specific Report Object on page 8.

Switch between Automatic Chart and a Specific Report Object

To switch the automatic chart to the specific type that is currently displayed, move the cursor over the \( \text{\text{Use } \text{chart-type}} \) button, click \( \text{\text{Use } \text{chart-type}} \), and then select Use \text{chart-type}, where \text{chart-type} is the type that is currently displayed. (For example, List Table, Bar Chart, and so on.)

To switch back to an automatic chart, move the cursor over the \( \text{\text{Use automatic content}} \) button, click \( \text{\text{Use automatic content}} \), and then select Use automatic content.
Working with Bar Charts

About Bar Charts
A bar chart displays data by using bars. The height of each bar represents the value.
By default, a bar chart is sorted in descending order by the value of the first measure. For a grouped bar chart, the data is sorted by the category values in alphabetical order.
Note: If the chart contains a rank, then, by default, the data is sorted based on the values of the rank.

Data Roles for a Bar Chart
For information about setting data roles, see “Working with Data Role Assignments” in SAS Visual Analytics: Working with Report Data.

The basic data roles for a bar chart are categories and measures. You can assign one category only, and the category values are plotted on the category axis. You can assign many measures, and the measure values are plotted on the response axis. If a bar chart contains no measures, then the frequency of the category values is plotted on the response axis.

In addition to the basic data roles, you can assign these roles:

Group
- groups the data based on the values of the category data item that you assign. Depending on the value that you selected for the Grouping style property, the group values are shown as either individual bars or as segments of each bar.
  Note: Grouping is not available if you assign multiple measures to the chart.

Lattice columns
- creates a lattice of charts with a column for each value of the category data item that you assign.

Lattice rows
- creates a lattice of charts with a row for each value of the category data item that you assign.

Data tip values
- specifies data items whose values are included in the data tips for the chart. Measure values are aggregated by sum.

Animation
- specifies a datetime data item that is used to animate the chart.
  If you assign the Animation data role, then the ▶ icon appears at the bottom left corner of the report object. Click ▶ to start the animation.

Options for a Bar Chart
For information about general options, see Using the Options Pane for Report Objects on page 3.
In addition to the general options, you can specify the following object-specific options on the Options pane:

Show data labels
- shows the data values as text in the chart.
  Note: You can always view a data value as a data tip when you position the cursor over a data value.
Show grid lines
displays grid lines for each tick on the response axis.

Direction
specifies whether the bars are vertical 🙈 or horizontal 🙌.

Fixed baseline
specifies the baseline value for the bar chart.

Note: This option is disabled if the Group scale option is set to Normalize groups to 100%, or if the Grouping style option is set to 🙌.

Grouping style
specifies how grouped data is displayed. If you select 🙊, then each value of the grouping variable is displayed as a separate bar. If you select 🙊, then the values of the grouping variable are displayed as segments of each bar.

Group scale
specifies how the data values for a grouped chart are displayed. By default, the chart displays the actual measure values (Display actual values). If you select Normalize groups to 100%, then the values for each grouped bar are displayed as percentages of the total.

- The Group scale option is not available for the dual axis bar chart or the dual axis bar-line chart.
- The Normalize groups to 100% selection requires that either the Group role is assigned or that multiple measures are assigned.
- If you select Normalize groups to 100% for a bar chart, then the Fixed baseline option is not available.
- Negative values are ignored in the 100% stacked bar chart.

Transparency
specifies the amount of transparency for the bars.

Measure layout
specifies whether the measures share a single response axis (Shared Axis) or have separate response axes for each measure (Separate Axes). If you specify Automatic, then separate axes are automatically assigned if the measure values are dissimilar in format or magnitude.

Note: When Separate Axes is specified, options are applied to all individual bar charts.

Combine excluded into “All Other”
summarizes all excluded rows. This option is available when you use summarized data, and it applies to both ranks and post-aggregate filters. The effect of this option can be influenced by certain types of actions. For more information, see Use the Combine Excluded into “All Other” Option on page 6.

---

Working with Box Plots

About Box Plots
A box plot displays the distribution of data values by using a rectangular box and lines called "whiskers."
Parts of a Box Plot on page 11 shows a diagram of a box plot. The bottom and top edges of the box indicate the interquartile range (IQR). That is, the range of values that are between the first and third quartiles (the 25th and 75th percentiles). The marker inside the box indicates the mean value. The line inside the box indicates the median value.

You can enable outliers, which are data points whose distances from the interquartile range are greater than 1.5 times the size of the interquartile range. Outliers can be located at either the upper extreme or the lower extreme of the data range.

The whiskers (lines protruding from the box) indicate the range of values that are outside of the interquartile range. If you do not enable outliers, then the whiskers extend to the maximum and minimum values in the plot. If you enable outliers, then the whiskers indicate the range of values that are outside of the interquartile range, but are close enough not to be considered outliers.

If there are a large number of outliers, then the range of outlier values is represented by a bar. The data tip for the bar displays additional information about the outliers.

**Data Roles for a Box Plot**

For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

The basic data roles for a box plot are categories and measures. You can assign one category only, and the category values are plotted on the category axis. You can assign many measures, and the measure values are plotted on the response axis. At least one measure is required.

**Note:** Frequency cannot be assigned to a measure data role for a box plot.

In addition to the basic data roles, you can assign these roles:

- **Lattice columns**
  - creates a lattice of charts with a column for each value of the category data item that you assign.

- **Lattice rows**
  - creates a lattice of charts with a row for each value of the category data item that you assign.

**Options for a Box Plot**

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the **Options** pane:
Box direction
specifies whether the boxes are vertical (↑) or horizontal (→).

Measure layout
specifies whether the measures share a single response axis (Shared Axis) or have separate response axes for each measure (Separate Axes).

Outliers
specifies how outliers are displayed. An outlier is a data point whose distance from the interquartile range is greater than 1.5 times the size of the interquartile range.

Select one of the following:

Ignore Outliers
excludes outliers from the plot. If you select this option, then outlier values are not represented in the plot.

Hide Outliers
includes the outliers within the whiskers. If you select this option, then outlier values are not represented differently from the other values in the plot.

Show Outliers
displays outliers separately from the whiskers. If there are a small number of outliers, then each outlier is displayed as a point. If there are a large number of outliers, then the range of outlier values is displayed as a bar.

Show averages
displays the mean value as a marker inside the box.

Working with Bubble Plots

About Bubble Plots
A bubble plot displays the values of at least three measures by using differently sized plot markers (bubbles) in a scatter plot. The values of two measures are represented by the position on the plot axes, and the value of the third measure is represented by the marker size.

You can create animated bubble plots to display changing data over time.

Data Roles for a Bubble Plot
For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

The basic data roles for a bubble plot are:

X axis
specifies the measure that is assigned to the X axis.

Y axis
specifies the measure that is assigned to the Y axis.

Size
specifies the measure that determines the marker size.

In addition to the basic data roles, you can assign these roles:

Group
groups the data based on the values of the category data item that you assign. A separate set of points is created for each value.
Note: You cannot assign both the **Group** role and the **Color** role at the same time.

**Color**
specifies a data item that determines the color of the bubbles. If you specify a category, then each value of the category is represented by a different bubble color. If you specify a measure, then the measure value is represented by the bubble color.

Note: You cannot assign both the **Group** role and the **Color** role at the same time.

**Lattice columns**
creates a lattice of charts with a column for each value of the category data item that you assign.

**Lattice rows**
creates a lattice of charts with a row for each value of the category data item that you assign.

**Data tip values**
specifies data items whose values are included in the data tips for the plot. Measure values are aggregated by sum.

**Animation**
specifies a datetime data item that is used to animate the bubble plot.

Note: The **Animation** role is enabled only if you assign a data item to the **Group** role.

If you assign the **Animation** data role, then the ▶️ icon appears at the bottom left corner of the report object. Click ▶️ to start the animation.

---

**Options for a Bubble Plot**

For information about general options, see *Using the Options Pane for Report Objects on page 3.*

In addition to the general options, you can specify the following object-specific option on the **Options** pane:

**Transparency**
specifies the amount of transparency for the bubbles.

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**Working with Butterfly Charts**

**About Butterfly Charts**

A butterfly chart displays two bar charts with a shared category axis. The baselines of the two bar charts are located in the center of the chart.

**Data Roles for a Butterfly Chart**

For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

The basic data roles for a butterfly chart are categories and measures. You can assign one category only, and the category values are plotted on the category axis. You can assign one measure for each side of the butterfly chart, and the measure values are plotted on the response axis.

In addition to the basic data roles, you can assign these roles:

**Data tip values**
specifies data items whose values are included in the data tips for the chart. Measure values are aggregated by sum.
Options for a Butterfly Chart

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the Options pane:

Show data labels
- shows the data values as text in the chart.

Note: You can always view a data value as a data tip when you position the cursor over a data value.

Fixed baseline
- specifies the baseline value for the bars on each side of the chart.

Transparency
- specifies the amount of transparency for the bars.

Working with Controls

About Controls

A control is a report object that filters or narrows the scope of the data that you are currently viewing. A control enables you to group your data by a selected category, and then select which group you want to view. When you drag and drop a data item onto a control, the control creates a group based on that data item. For example, you might have a data item called Cars that contains all of the models that a manufacturer produces. When you drag and drop the Cars data item onto a drop-down list, the control groups the car models, and then you can select a car model to use as a filter. Controls can be used in a report with interactions.

Starting in the 8.1 release, SAS Visual Analytics automatically computes the height and width of any control when the report is rendered. This makes reports more portable across various screen sizes. For example, the height of a list control might be 10% of your report height on one screen, and 5% of your report height on another screen. If you want a control to always be a fixed percentage of the report's height and width on any screen, you can use the Specify width and Specify height options on the Options pane.

Here are some key points about filtering using controls:

- Filters use the AND operator.
- Filters are applied as separate steps.
- The filter results are impacted by the type of data used in the control.

Report prompts are controls that are placed in the special area above the canvas. A report prompt automatically filters all of the other report objects as long as the report object uses the same data source as the report prompt control or there is a data source mapping between the report prompt's data source and objects in the report. For more information, see Use a Control to Create a Report Prompt on page 16.

Page prompts are the controls that are placed in the special row area at the top of the canvas. A page prompt automatically filters all of the other report objects on the same page, as long as the report object uses the same data source as the page prompt control or if there is data source mapping between the report prompt's data source and the objects in the report. For more information, see Use a Control to Create a Page Prompt on page 17.

You can place any control in the main area of the canvas below the page prompt row. You must define explicit actions (using the Actions pane) between these controls (as the source report objects) and one or more target report objects. For more information about actions, see “Overview of Report Actions” in SAS Visual Analytics: Working with Report Data.
Note: A slider control that has a category data item assigned cannot have a rank.

For a definition and a picture of each control type, see “Gallery of Report Objects” in SAS Visual Analytics: Reference.

Data Roles for Controls

For information about setting data roles, see “Working with Data Role Assignments” in SAS Visual Analytics: Working with Report Data.

In general, the basic data roles for controls are category data items and measure data items. For more information, see “About Data Items” in SAS Visual Analytics: Working with Report Data.

The button bar control, drop-down list control, text input control, and slider control (single-point only) support parameters. For more information, see “Overview of Parameters in Reports” in SAS Visual Analytics: Working with Report Data.

You can assign these data roles:

Button bar control
   - Category, Measure, and Parameter. A category data item is required.

Drop-down list control
   - Category, Measure, and Parameter. A category data item is required.

List control
   - Category and Measure. A category data item is required.

Slider control
   - Measure/Date and Parameter. Note that only single-point sliders support parameters.

Text input control
   - Category, Measure, and Parameter. Both a category data item and a parameter are required.

Options for Controls

For information about general options, see Using the Options Pane for Report Objects on page 3.

Button Bar Control

Required
   - specifies that you want to require users to make a selection in the button bar.

Direction
   - specifies whether the button bar is vertical or horizontal. The Horizontal option is selected by default.

Drop-down List Control

Required
   - specifies that you want to require users to make a selection in the drop-down list.

List Control

Required
   - specifies that you want to require users to make a selection in the list. If you select this option, at least one check box must always be selected.
Allow multiple selections
specifies that multiple selections are enabled in the list. If you clear the Allow multiple selections check box, radio buttons are displayed instead of check boxes, and the Required option is applied automatically.

Slider Control
Value
enables you to specify whether the value in the slider is Single or a Range.
Direction
specifies whether the slider is vertical or horizontal. The Horizontal option is selected by default.
Interact on the data in view
specifies that you want to have the slider interactively filter the post-aggregated data.
Set fixed range
enables you to specify the Minimum and Maximum options for the slider end points.
Note: You cannot have a filter or rank when the Set fixed range option is selected for a slider.

Text Input Control
Background color
enables you to specify the color of the text background.

Use a Control to Create a Report Prompt
If you use a control to create a report prompt, then the user can select a value to filter the data in the report. You can use a report prompt to cascade filters to a page prompt.
To use a control to create a report prompt:
1 If the page prompt area is not displayed above the canvas, click above the Options pane.
   TIP Look for the hint text that says, “Drop a data item or control to create a report prompt.”
2 Drag the control icon from the Objects pane, and drop it onto the area above the canvas.
   Note: You can also use a prompt container to create a report prompt.
3 Drag and drop a category, measure, or parameter onto the control. For example, if you drag and drop a drop-down list control, then you can assign a category like Facility City or Facility State. Then, the drop-down list is populated with the cities or states that are used in that category.
   You can also use the Roles pane to specify the Category and Measure roles for the report prompt.
4 (Optional) Update the general options for the report prompt. You can update the Name, Description, and Font.
   Note: If you choose a custom color for the Font option, it is saved between SAS Visual Analytics sessions. Your custom colors are displayed in the color palette.
5 (Optional) Update the specific options for the report prompt. The available options depend on the selected control.
   Here are some details about the options for controls:
By default, the Enable selection in the viewers option is not selected for controls. This means that users who use the web viewer or a mobile device cannot select the control, and must click to see the control name and any incoming filter information. However, users can still modify values for the control.

For drop-down lists and button bars, select the Required option if you want to require a user to make a selection in the control. If you select the Required option for a drop-down list, at least one check box must always be selected.

For sliders, for the Value option, Range is selected by default. Select the Interact on the data in view option to have the control filter only the aggregated data that is currently displayed in the report. If you clear this option, then the detail data is filtered.

Note: If the Interact on the data in view option is not selected, then a slider does not filter crosstabs or time series plots.

Alternatively, you can create an automatic control by dragging and dropping a data item onto the report prompt area. If the data item is a category with low distinct values, then a button bar is displayed. If the data item has many distinct values, a text input is displayed. If the data item is a measure, then a slider is displayed.

If the report prompt uses one data source, and the report objects on the canvas use another data source, you can change the data source mappings by right-clicking the control, and then selecting Edit data source mappings. For more information, see “Map Data Sources” in SAS Visual Analytics: Working with Report Data.

Use a Control to Create a Page Prompt

If you use a control to create a page prompt, then the user can select a value to filter the data of all the other report objects on the same page that use the same data source. The button bar, drop-down list, and text input controls are the only controls that can be used as page prompts. You can create cascading (or dependent) page prompts.

Page prompts can be affected by report prompts.

To use a control to create a page prompt:

1. If the page prompt area is not displayed above the canvas, click above the Options pane.

   **TIP** Look for the hint text that says, “Drop a data item or control to create a page prompt.”

2. Drag the control icon from the Objects pane, and drop it onto the area above the canvas.

   **Note:** You can also use a prompt container to create a page prompt.

3. Drag and drop a category, measure, or parameter onto the control. For example, if you drag and drop a drop-down list control, then you can assign a category like Facility City or Facility State. Then, the drop-down list is populated with the cities or states that are used in that category.

   You can also use the Roles pane to specify the Category and Parameter roles for the page prompt.

Alternatively, you can create an automatic control by dragging and dropping a category data item onto the page prompt area. If the data item has low distinct values, then a button bar is displayed. If the data item has many distinct values, a text input is displayed. A measure data item cannot be used for a page prompt.

If the page prompt uses one data source, and the report objects on the canvas use another data source, you can change the data source mappings by right-clicking the control, and then selecting Edit data source mappings. For more information, see “Map Data Sources” in SAS Visual Analytics: Working with Report Data.
Working with Correlation Matrices

About Correlation Matrices
A correlation matrix displays the degree of correlation between multiple intersections of measures as a matrix of rectangular cells. Each cell in the matrix represents the intersection of two measures, and the color of the cell indicates the degree of correlation between those two measures.

A correlation matrix can either compare within a single set of measures or it can compare between two sets of measures.

The correlation values are calculated by using Pearson’s product-moment correlation coefficient. Correlation values are identified as weak, moderate, or strong as follows:

Weak
  the absolute value is 0.3 or lower

Moderate
  the absolute value is greater than 0.3 and less than or equal to 0.6

Strong
  the absolute value is greater than 0.6

Data Roles for a Correlation Matrix
For information about setting data roles, see “Working with Data Role Assignments” in SAS Visual Analytics: Working with Report Data.

The basic data role for a correlation matrix is a measure. You must assign at least two measures. If the Show correlations option is set to Between two sets of measures, then the measures are assigned to the X axis and Y axis roles.

Note: The maximum number of measures is 60.

Options for a Correlation Matrix
For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the Options pane:

Show correlations
  specifies whether the correlation matrix uses a single set of measures (Within one set of measures) or two sets of measures (Between two sets of measures.)

Show border
  specifies that the borders between cells are visible.

Rotate axis labels
  displays the axis labels at an angle.
Working with Crosstabs

About Crosstabs
A crosstab displays the intersections of category values and measure values as text. If the crosstab contains measures, then each cell of the crosstab contains the aggregated measure values for a specific intersection of category values. If the crosstab does not contain measures, then each cell of the crosstab contains the frequency of an intersection of category values.

You should consider placing lower cardinality (fewer distinct values) categories on the columns and higher cardinality (more distinct values) categories on the rows. Crosstabs can help you improve readability, especially when there are several category data items to include in your table.

By default, frequency is displayed only when there are no measures in the crosstab. If you add a category data item first, then the Frequency column is automatically added. When you add a measure data item, the Frequency column is automatically replaced by the measure that you added. If you add a measure data item first, then the Frequency column is added only if you manually add it.

Here are some key points about crosstabs:

- You can create a linked selection for totals and subtotals in a crosstab.
- A crosstab does not show data if the query is too large.

Data Roles for a Crosstab
For information about setting data roles, see “Working with Data Role Assignments” in SAS Visual Analytics: Working with Report Data.

The basic data roles for a crosstab are columns, rows, and measures. You can assign either a single hierarchy or any number of categories to each column and row role. If you assign measures to the crosstab, then the measure values are displayed in the cells of the crosstab. If you do not assign measures, then the frequency of each intersection of values is displayed in the cells of the crosstab.

Options for a Crosstab
For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the Options pane:

Show missing labels as blanks
- displays missing values as empty cells in the crosstab. By default, missing values are represented by a period (.) character.

Indented
- selects the indented layout for the crosstab.

Show column totals
- adds totals to each column.
  Note: Total values are aggregated based on the aggregations for each measure.

Show row totals
- adds totals to each row.
  Note: Total values are aggregated based on the aggregations for each measure.
Totals Placement
specifies the location of totals and subtotals. Select **Before** to place the totals and subtotals before the axis headings. Select **After** to place the totals and subtotals after the axis headings.

Note: For the indented layout, totals are always placed before the axis headings.

Show column subtotals
adds subtotals to each column for each node on the row axis after the first.

Note: For the indented layout, subtotals are always enabled.

Show row subtotals
adds subtotals to each row for each node on the column axis after the first.

Note: For the indented layout, subtotals are always enabled.

Managing Rows and Columns

Rearrange Rows and Columns
To rearrange your rows and columns, use the **Roles** pane. Hold your pointer over the indicator beside the row or column name until the pointer changes from a single arrow to multiple arrows, and then click and drag the row or column to a new position in the list.

Note: You cannot remove empty columns in a crosstab, which are there so that you can drag and drop additional data items while designing a report.

Resize Columns
To resize a column, click on it in the crosstab, and then drag and drop the left or right edge of the column heading.

Working with Decision Trees

About Decision Trees
Note: If SAS Visual Statistics is licensed at your site, then the decision tree contains advanced features. For more information, see “Working with Decision Trees” in SAS Visual Analytics: Working with SAS Visual Statistics.

A decision tree uses the values of one or more predictor data items to predict the values of a response data item. A decision tree displays a series of nodes as a tree, where the top node is the response data item, and each branch of the tree represents a split in the values of a predictor data item. Decision trees are also known as classification and regression trees.
Each branch of the tree displays the name of the predictor for the branch at the top of the split. The thickness of the branch indicates the number of values that are associated with each node. The predictor values for each node are displayed above the node.

Each node in the tree displays the data for the node either as a histogram (if the response contains continuous data and response bins are enabled), as a set of aggregated values (if the response contains continuous data and response bins are disabled), or as a bar chart (if the response contains discrete data). The histogram, aggregated values, or bar chart in each node displays the values of the response data item that are selected by the splits in the tree.

Below the decision tree, an icicle plot of the nodes is displayed. The color of the node in the icicle plot indicates the predicted level for that node. When you select a node in either the decision tree or the icicle plot, the corresponding node is selected in the other location.

Decision trees in SAS Visual Analytics use a modified version of the C4.5 algorithm.

The details table for a decision tree contains two additional data columns, Node ID and Parent ID. Node ID specifies a unique value for each node in the tree. Parent ID specifies the ID of the parent node.

**Data Roles for a Decision Tree**

For information about setting data roles, see “Working with Data Role Assignments” in SAS Visual Analytics: Working with Report Data.

The basic data roles for a decision tree are:
Response
specifies the response for the decision tree. You can specify any category or measure. The decision tree attempts to predict the values of the response data item. Each node in the tree displays the values of the response data item.

Predictors
specifies predictors for the decision tree. You can specify one or more categories or measures as predictors. The values of predictor data items are displayed above the nodes in the tree. The order of the data items in the Predictors list does not affect the tree.

Note: If a predictor does not contribute to the predictive accuracy of the tree or the contribution has been pruned, then the predictor is not included in the final tree that is displayed.

Options for a Decision Tree

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the Options pane:

Include missing
specifies whether missing values are included in the tree.

Growth strategy
specifies the parameters that are used to create the decision tree. Select one of the following values:

- **Basic**
  specifies a simple tree with a maximum of two branches per split and a maximum of six levels. For details, see Parameter Values for the Basic and Advanced Growth Strategies on page 23.

- **Advanced**
  specifies a complex tree with a maximum of four branches per split and a maximum of six levels. For details, see Parameter Values for the Basic and Advanced Growth Strategies on page 23.

- **Custom**
  enables you to select the values for each of the parameters.

If you select Custom as the value for Growth strategy, then the following additional options appear:

Maximum branches
specifies the maximum number of branches for each node split.

Maximum levels
specifies the maximum number of levels in the tree.

Leaf size
specifies the minimum number of values (count) for each node.

Bin response variable
if the response variable contains continuous data, splits the response values into bins.

Response bins
specifies the number of bins that are used for the response data item.

Note: This option is available only if the Bin response variable option is enabled.

Predictor bins
specifies the number of bins that are used for predictor data items.

Note: This option has no effect if the predictor data items contain discrete data.

Rapid growth
enables you to use the information gain ratio and k-means fast search methods for decision tree growth. When disabled, the information gain and greedy search methods are used, which generally produce a larger tree and require more time to create.
Pruning
specifies the level of pruning that is applied to the tree. Pruning removes leaves and branches that contribute
the least to the predictive accuracy of the tree. A higher pruning value specifies that more leaves and
branches are removed from the tree.

Reuse predictors
specifies that predictors can be used more than once in a branch. That is, a predictor can be used more than
once on the path leading to a leaf.

The following parameter values are used for the Basic and Advanced growth strategies:

<table>
<thead>
<tr>
<th>Property</th>
<th>Basic Value</th>
<th>Advanced Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum branches</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Maximum levels</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Leaf size</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Bin response variable</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Response bins</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Predictor bins</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Pruning</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Reuse predictors</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Derive a Leaf ID Data Item from a Decision Tree
You can derive a leaf ID data item to represent the results of a decision tree. The leaf ID data item creates
values that correspond to the node IDs in the details table for the decision tree.

You can use the leaf ID data item in a filter to select the values for a decision tree node in other types of report
objects.

To calculate a leaf ID data item from a decision tree:

1. Move the cursor over the icon for the decision tree, click the drop-down list, and then select Derive a
   leaf ID variable.
2. In the New Leaf ID window, enter a Name for the new calculated item.
3. Click OK to create the new data item.

Zoom a Decision Tree
You can zoom a decision tree by scrolling the mouse wheel. The decision tree zooms in and at the location of
the cursor.

If you zoom out on a decision tree with a categorical response or a binned measure, then each leaf node
displays a single bar for the greatest value in that node.
If you zoom out on a decision tree with an unbinned measure response, then the color of each leaf node indicates the average response value for the node.

When you have zoomed in on a decision tree, you can reposition the decision tree by clicking the tree and dragging it.

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**Working with Dual Axis Bar Charts**

**About Dual Axis Bar Charts**

A dual axis bar chart displays two bar charts with a shared category axis and separate response axes.

By default, a bar chart is sorted in descending order by the value of the first measure. If the chart contains a rank, then, by default, the data is sorted based on the values of the rank.

**Data Roles for a Dual Axis Bar Chart**

For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

The basic data roles for a bar chart are categories and measures. You can assign one category only, and the category values are plotted on the category axis. You can assign one measure for each response axis in the chart.

In addition to the basic data roles, you can assign these roles:

- **Lattice columns** creates a lattice of charts with a column for each value of the category data item that you assign.

- **Lattice rows** creates a lattice of charts with a row for each value of the category data item that you assign.

- **Data tip values** specifies data items whose values are included in the data tips for the chart. Measure values are aggregated by sum.

- **Animation** specifies a datetime data item that is used to animate the chart.

  If you assign the Animation data role, then the ▶ icon appears at the bottom left corner of the report object. Click ▶ to start the animation.

**Options for a Dual Axis Bar Chart**

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the Options pane:

- **Show data labels** shows the data values as text in the chart.

  **Note:** You can always view a data value as a data tip when you position the cursor over a data value.

- **Fixed baseline** specifies the baseline value for the bar chart.

- **Transparency** specifies the amount of transparency for the bars.
**Combine excluded into “All Other”**

combines content across categories (for example, the content that is formed by combining the report object’s visible categories). This option is frequently used with filters and ranks. The effect of this option can be influenced by certain types of actions. For more information, see Use the Combine Excluded into “All Other” Option on page 6.

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**Working with Dual Axis Bar-Line Charts**

**About Dual Axis Bar-Line Charts**

A dual axis bar-line chart combines a bar chart and a line chart on a shared category axis. The bar chart and line chart have separate response axes.

By default, a bar chart is sorted in descending order by the value of the first measure. If the chart contains a rank, then, by default, the data is sorted based on the values of the rank.

**Data Roles for a Dual Axis Bar-Line Chart**

For information about setting data roles, see “Working with Data Role Assignments” in SAS Visual Analytics: Working with Report Data.

The basic data roles for a dual axis bar-line chart are categories and measures. You can assign one category only, and the category values are plotted on the category axis. You can assign one measure for the bars and one measure for the line chart. Each of the measures is plotted on a separate axis.

In addition to the basic data roles, you can assign these roles:

- **Lattice columns** creates a lattice of charts with a column for each value of the category data item that you assign.
- **Lattice rows** creates a lattice of charts with a row for each value of the category data item that you assign.
- **Data tip values** specifies data items whose values are included in the data tips for the chart. Measure values are aggregated by sum.
- **Animation** specifies a datetime data item that is used to animate the chart.

If you assign the Animation data role, then the ▶ icon appears at the bottom left corner of the report object. Click ▶ to start the animation.

**Options for a Dual Axis Bar-Line Chart**

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the Options pane:

- **Show data labels** shows the data values as text in the chart.
  
  **Note:** You can always view a data value as a data tip when you position the cursor over a data value.

- **Fixed baseline** specifies the baseline value for the bar chart.
Transparency
specifies the amount of transparency for the bars.

Show fill
displays a color fill for the area below the line chart.

Show markers
displays markers for the data points on the line chart.

Transparency
specifies the amount of transparency for the line. If Show fill is enabled, then this option also affects the transparency of the fill.

Combine excluded into “All Other”
combines content across categories (for example, the content that is formed by combining the report object’s visible categories). This option is frequently used with filters and ranks. The effect of this option can be influenced by certain types of actions. For more information, see Use the Combine Excluded into “All Other” Option on page 6.

Working with Dual Axis Line Charts

About Dual Axis Line Charts
A dual axis line chart displays data by using two lines that connect the data values for a shared category axis.

Data Roles for a Dual Axis Line Chart
For information about setting data roles, see “Working with Data Role Assignments” in SAS Visual Analytics: Working with Report Data.

The basic data roles for a dual axis line chart are categories and measures. You can assign one category only, and the category values are plotted on the category axis. You can assign one measure to each of the measure roles, and the values for each measure are plotted on a separate axis.

In addition to the basic data roles, you can assign these roles:

Lattice columns
creates a lattice of charts with a column for each value of the category data item that you assign.

Lattice rows
creates a lattice of charts with a row for each value of the category data item that you assign.

Data tip values
specifies data items whose values are included in the data tips for the chart. Measure values are aggregated by sum.

Animation
specifies a datetime data item that is used to animate the chart.

If you assign the Animation data role, then the icon appears at the bottom left corner of the report object. Click to start the animation.

Options for a Dual-Axis Line Chart
For information about general options, see Using the Options Pane for Report Objects on page 3.
In addition to the general options, you can specify the following object-specific options on the Options pane:

**Show data labels**
- shows the data values as text in the chart.

**Note:** You can always view a data value as a data tip when you position the cursor over a data value.

**Line thickness**
- specifies the thickness of the line.

**Show fill**
- creates a color fill for the areas below the line.

**Fixed baseline**
- specifies the baseline value for the line.

**Show markers**
- displays markers for the data points on the line.

**Transparency**
- specifies the amount of transparency for the line. If **Show fill** is enabled, then this option also affects the transparency of the fill.

**Combine excluded rows into “All Other”**
- summarizes all excluded rows. This option is available when you use summarized data, and it applies to both ranks and post-aggregate filters. The effect of this option can be influenced by certain types of actions. For more information, see Use the Combine Excluded into “All Other” Option on page 6.

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**Working with Dual Axis Time Series Plots**

**About Dual Axis Time Series Plots**
A dual axis time series plot displays two time series that share a common X axis.

**Data Roles for a Dual Axis Time Series Plot**
For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

The basic data roles for a time series plot are the time axis and measures. You can assign one datetime data item only to the time axis. You can assign one measure for each of the lines in the plot.

In addition to the basic data roles, you can assign these roles:

**Data tip values**
- specifies data items whose values are included in the data tips for the chart. Measure values are aggregated by sum.

**Options for a Dual Axis Time Series Plot**
For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the Options pane:

**Show data labels**
- shows the data values as text in the plot.

**Note:** You can always view a data value as a data tip when you position the cursor over a data value.
Line thickness
specifies the thickness of the line.

Show markers
shows markers for the data points in the plot.

Marker size
specifies the size of the markers on the line.

Use filled markers
specifies whether the markers on the line are filled.

Show fill
creates a color fill for the areas below the line.

Binning interval
specifies interval between datetime values in the plot. Select one of the following values:

- Automatic
  automatically determines the best interval for the plot.
- Fixed count
  plots a specific number of equally spaced values. Specify the number of values in the Fixed bin count option.
    Note: This selection is unavailable if forecasting is enabled.
- Use format
  plots all of the datetime values as rendered by the data format.

Fixed bin count
specifies the number of datetime values to plot.

Note: This option is available only if Binning interval is set to Fixed count.

Transparency
specifies the amount of transparency for the plot.

Working with Gauges

About Gauges
A gauge is a dashboard indicator that compares an actual value to a target value. Several types of gauges are available:

- Bullet
  displays a linear gauge. The target value is indicated by a line and the actual value is indicated by a narrow bar.

- Dial
  displays an arc-shaped gauge. The target value is indicated by a black arrow pointing inward. The actual value is indicated by a white arrow pointing outward.

- Slider
  displays a linear gauge. The target value is indicated by a small black arrow. The actual value is indicated by a large white arrow.

- Speedometer
  displays an arc-shaped gauge. The target value is indicated by a small white triangle pointing outward. The actual value is indicated by a black pointer pointing outward.
Thermometer displays a linear gauge. The target value is indicated by a line. The actual value is indicated by the background bar.

The scale of the gauge and the colored data ranges on the gauge are controlled by display rules. To change these properties, edit the display rules for the gauge.

### Data Roles for a Gauge

For information about setting data roles, see “Working with Data Role Assignments” in SAS Visual Analytics: Working with Report Data.

The basic data role for a gauge is a measure.

In addition to the basic data roles, you can assign these roles:

- **Target**
  - specifies the target value for the gauge.

- **Data tip values**
  - specifies one or more measures whose values are included in the data tips for the chart. Measure values are aggregated by sum.

### Options for a Gauge

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the **Options** pane:

- **Show value label**
  - specifies whether the actual value is displayed as a number in the gauge.

- **Show range labels**
  - specifies whether the labels for the tick marks in the gauge are displayed.

- **Type**
  - specifies the type of gauge that is displayed. For descriptions of each type, see About Gauges on page 28.

- **Direction**
  - specifies whether the gauge is Horizontal or Vertical. This option is not available if the gauge type is Dial or Speedometer.

### Working with Geo Maps

#### About Geo Maps

A geo map overlays your data on a geographic map. You can display your data either as bubbles, as a scatter plot, or as colored regions on the geo map.

To display a geo map, you must define one or more of the categories as geography data items. For more information, see “Working with Geography Data Items” in SAS Visual Analytics: Working with Report Data.

#### Data Roles for a Geo Map

For information about setting data roles, see “Working with Data Role Assignments” in SAS Visual Analytics: Working with Report Data.
The basic data roles for a Geo Map are:

**Category**
- Specifies the geography data item that identifies geographic regions for your map. Geography data items are identified by the icon.

**Size**
- For the **Bubbles** map type, specifies the measure that determines the bubble size.

**Color**
- For the **Regions** map type, specifies the measure that determines the regions’ colors.
- For the **Bubbles** map type, specifies a measure that determines the bubble color.
- For the **Coordinates** map type, specifies a measure that determines the marker color.

**Data tip values**
- Specifies data items whose values are included in the data tips for the map. Measure values are aggregated by sum.

**Animation**
- For the **Bubbles** map type, specifies a datetime data item that is used to animate the bubble plot.

If you assign the **Animation** data role, then the icon appears at the bottom left corner of the report object. Click to start the animation.

---

**Options for a Geo Map**

For information about general options, see *Using the Options Pane for Report Objects on page 3.*

In addition to the general options, you can specify the following object-specific options on the **Options** pane:

**Type**
- Specifies the type of data overlay for the map. Select one of the following values:
  - **Coordinates**
    - Displays your data as a simple scatter plot on the map. Each point is located at the center of a geographic region or at the coordinates of a location.
  - **Bubbles**
    - Displays your data as a series of bubbles. Each bubble is located at the center of a geographic region or at the coordinates of a location.
  - **Regions**
    - Displays your data as colored regions on the map.

  **Note:** The **Regions** map style is not available for custom geographic roles or for ZIP codes.

**Transparency**
- Specifies the amount of transparency for the data overlay.

**Map service**
- Specifies the source for the background map.

---

**Zoom a Geo Map**

You can zoom the map by using any of the following controls:

- Scroll the mouse wheel to zoom in or zoom out at the location of the cursor.
- Enable the zoom control by selecting from the object toolbar. Click to zoom in and to zoom out.
Use Cursor Tools to Pan a Map and Create Shape-Based Selections

In a geo map, the cursor can perform different tasks when you click and drag the map. The default cursor action is to pan (scroll) the map.

To change the selected cursor tool, select the icon from the object toolbar that matches the current tool, and then select one of the following icons:

- pans (scrolls) the map.
- creates a rectangular selection.
- creates a circular selection.
- creates a free-form selection.

Create a Radius-Based Selection in a Geo Map

You can create a radius-based selection in order to determine distances from a specific point.

To create a selection:

1. Right-click a point on the map, and then select **Create geographic selection**, or click on a search result.
2. Select the type of selection:
   - **Distance** creates a circular selection based on the distance in miles or kilometers.
   - **Drive-distance** creates an irregular selection based on the driving distance using roads.
   - **Drive-time** creates an irregular selection based on the distance that can be driven in the specified amount of time.

   **Note:** The **Drive-distance** and **Drive-time** selections are available only if you have enabled Esri premium services in your SAS Visual Analytics settings. For more information, see “Modify SAS Visual Analytics Settings” in SAS Visual Analytics: Designing Reports.
3. Specify the radius for the selection.
4. (Optional) For **Drive-distance** and **Drive-time** selections, add breaks to the selection. Breaks are additional rings of selection. Each break has a different background color on the map.
5. Click **OK** to create the selection.

You can use the selection to filter your data. To create a selection filter, right-click the map, and then select **Include only selection**. To create an exclusion filter, right-click the map, and then select **Exclude selection**.

Search a Geo Map

**Note:** The search feature does not search the values in your data. Instead, it searches a database that is part of the ArcGIS Online service.
To search the map, move the cursor over the icon, and enter your search term. The search returns businesses and locations that are located within your current map view. The search can return up to 20 results.

Note: Some results are displayed only at closer zoom levels. For example, if your map displays an entire country, then results for small businesses might not be displayed.

---

**Working with Heat Maps**

**About Heat Maps**

A heat map displays the distribution of values for two data items by using a table with colored cells. If you do not assign a measure to the **Color** data role, then a cell’s color represents the frequency of each intersection of values. If you assign a measure to the **Color** data role, then a cell’s color represents the aggregated measure value for each intersection of values.

If you apply more than two axis items to the heat map, the heat map object displays a matrix of heat maps. The matrix displays each possible pairing of axis items that are assigned.

**Data Roles for a Heat Map**

For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

The basic data roles for a heat map are:

- **Axis Items**
  - specifies data items that are assigned to the X and Y axes.

- **Color**
  - specifies a measure that determines the cell color. If you do not assign the **Color** role, then the cell color indicates frequency.

**Options for a Heat Map**

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the **Options** pane:

- **Bin count**
  - specifies the number of value ranges that are represented as cells. **Bin count** affects only measures.

- **Show borders**
  - specifies that the borders between cells are visible.

- **Fit Line**
  - adds a fit line to the heat map. For information about the fit types that are available, see Using Data Analysis in a Heat Map on page 32.

  Note: Fit lines are not available if fewer than two measures are assigned to the axes.

**Using Data Analysis in a Heat Map**

For heat maps, you can apply the following data analyses:
Correlation identifies the degree of statistical correlation between the variables in the report object. The strength of a correlation is described as a number between -1 and 1. A value that is close to -1 implies a strong negative correlation, a value that is close to 0 implies little or no correlation, and a value that is close to 1 implies a strong positive correlation.

Correlation is applied to your report object automatically when you add a linear fit line. It is not available with other fit types. The correlation value is displayed in the details table for the object. To see the details table, view the object in explore mode. See Viewing Report Objects in Explore Mode on page 7.

Fit Line plots a model of the relationship between the variables in the report object.

You can select any of the following fit types:

Best Fit selects the most appropriate model (linear, quadratic, or cubic) for your data. The Best Fit type uses backward variable selection to select the highest-order model that is significant. To see the final model that was used, view the object in explore mode.

Linear creates a linear fit line from a linear regression algorithm. A linear fit produces the straight line that best represents the relationship between two measures.

For a linear fit, correlation is automatically added to the report object. Correlation is not available with other fit types.

Quadratic creates a quadratic fit line. A quadratic fit produces a line with a single curve. A quadratic fit often produces a line with the shape of a parabola.

Cubic creates a cubic fit line. A cubic fit produces a line with two curves. A cubic fit often produces a line with an “S” shape.

PSpline creates a penalized B-spline. A penalized B-spline is a smoothing spline that fits the data closely. A penalized B-spline can display a complex line with many changes in its curvature.

Detailed information about the data analyses for your report object is available in the details table for the object. To see the details table, view the object in explore mode. See Viewing Report Objects in Explore Mode on page 7.

---

Working with Histograms

About Histograms

A histogram displays the distribution of values for a single measure. A series of bars represents the number of observations in the measure that match a specific value or value range. The bar height can represent either the exact number of observations or the percentage of all observations for each value range.

Note: If you use the default number of bins, then the minimum and maximum values on the histogram axis might not match the actual extent of your data values. If you specify the number of histogram bins, then the histogram axis matches your data values exactly.
Data Roles for a Histogram

For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

The basic data roles for a histogram are **Measure** and **Frequency**.

Options for a Histogram

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the **Options** pane:

- **Bar direction**
  - specifies whether the bars are vertical or horizontal.

- **Bin range**
  - specifies how the boundaries of the bin ranges are determined. Select one of the following:
    - **System-determined values**
      - places the boundaries at values that are rounded. The bin ranges might extend beyond the minimum and maximum values in the data.
    - **Measure values**
      - places the boundaries according to the actual minimum and maximum values in the data.

- **Set a fixed bin count**
  - enables the **Bin count** option.

  **Note:** A fixed bin count is available only if the **Bin range** option is **Measure values**.

- **Bin count**
  - specifies the number of bins (value ranges) for the histogram.

- **Transparency**
  - specifies the amount of transparency for the bars.

---

Working with Line Charts

About Line Charts

A line chart displays data by using a line that connects the data values. If you assign multiple measures to a line chart, then you can create separate Y axes for each measure.

Data Roles for a Line Chart

For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

The basic data roles for a line chart are categories and measures. You can assign one category only, and the category values are plotted on the category axis. You can assign many measures, and the measure values are plotted on the response axis. If the line chart contains no measures, then the frequency of the category values is plotted on the response axis.

In addition to the basic data roles, you can assign these roles:
**Group**
groups the data based on the values of the category data item that you assign. A separate line is created for each data value.

**Note:** Grouping is not available if you assign multiple measures to the chart.

**Lattice columns**
creates a lattice of charts with a column for each value of the category data item that you assign.

**Lattice rows**
creates a lattice of charts with a row for each value of the category data item that you assign.

**Data tip values**
specifies data items whose values are included in the data tips for the chart. Measure values are aggregated by sum.

**Animation**
specifies a datetime data item that is used to animate the chart.

If you assign the **Animation** data role, then the icon appears at the bottom left corner of the report object. Click to start the animation.

---

**Options for a Line Chart**

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the **Options** pane:

**Show data labels**
shows the data values as text in the chart.

**Note:** You can always view a data value as a data tip when you position the cursor over a data value.

**Line thickness**
specifies the thickness of the lines in the chart.

**Grouping style**
specifies the style overlay that is used when multiple measures are assigned to the chart. Select one of the following:

- **Overlay unfilled**
displays the lines without color fills.

- **Overlay filled**
displays the lines with transparent color fills.

- **Stack filled**
displays the lines with opaque color fills that are stacked. The values of the stacked lines are plotted relative to the lines below them, rather than to the baseline of the chart.

**Fixed baseline**
specifies the baseline value for the chart.

**Note:** this option is not available if the chart displays separate Y axes.

**Show markers**
shows markers for the data points in the chart.

**Marker size**
specifies the size of the markers in the chart.

**Use filled markers**
specifies whether the markers in the chart are filled.
Transparency
specifies the amount of transparency for the chart.

Measure layout
specifies whether the measures share a single response axis (Shared Axis) or have separate response axes for each measure (Separate Axes).

Sort Data Values
By default, for category data, a line chart is sorted in descending order by the value of the first measure. For datetime data, the chart is sorted in ascending order by the datetime values. To change the sorting, right-click on the data item that you want to sort on, select Sort, and then select a sorting method.

Working with List Tables

About List Tables
A list table displays data as text. The data value for each measure or category that is assigned to the table is displayed as a column.

By default, a list table contains aggregated data with one row for each distinct combination of category values. However, if the Show detail data check box has been selected, then all of the data is not aggregated.

Here are some key points about list tables:

- For very large data sources, the list table displays only the first two billion (2,147,483,647) rows.
- If you sort a list table, then the list table displays only the first 5,000 sorted rows.
- You cannot select the totals in a list table. Only rows with data are selectable.

Data Roles for a List Table
For information about setting data roles, see “Working with Data Role Assignments” in SAS Visual Analytics: Working with Report Data.

The basic data role for a list table is a column. A column can be any type of data item. You can add multiple columns to a table.

Options for a List Table
For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the Options pane:

- **Show totals**
  adds totals for each column.

  **TIP** Use this option to turn off or turn on the aggregation labels for totals.

- **Enable sorting**
  sorts the data. This option is available when you use summarized data, and it applies to both ranks and post-aggregate filters.
Show detail data
specifies that the data is not aggregated. This option is available when you use summarized data, and it applies to both ranks and post-aggregate filters.

Note: This option is not available if the list table already has an aggregate filter.

Combine excluded rows into “All Other”
summarizes all excluded rows. This option is available when you use summarized data, and it applies to both ranks and post-aggregate filters. The effect of this option can be influenced by certain types of actions. For more information, see Use the Combine Excluded into “All Other” Option on page 6.

Managing Columns

Sort Columns
By default, list tables are sorted in ascending order by the first data item that you add. To sort the list table by a column, right-click the column heading, and then select a sorting method. An arrow appears in the column heading to indicate the sorting.

Rearrange Columns
To rearrange your columns, use the Roles pane. Hold your pointer over the indicator beside the row or column name until the pointer changes from a single arrow to multiple arrows, and then click and drag the row or column to a new position in the list.

Note: You cannot remove empty columns in a list table, which are there so that you can drag and drop additional data items while designing a report.

Resize Columns
To resize a column, click, and then drag and drop the left or right edge of a column heading.

Working with Network Analysis Objects

About Network Analysis Objects
A network analysis object displays the relationships between data item values as a series of linked nodes.

You can create two types of network analysis:

Hierarchical
creates a hierarchical structure by using a hierarchy.

Ungrouped
creates a structure by using a source data item and a target data item. A node is created for each value of the source data item, and a link is created from each node to the node that corresponds to the value of the target data item.

For example, if your source data item specifies the name of every employee in an organization, and your target data item specifies the manager of each employee, then the network analysis has a node for each employee that is linked to the node for the employee’s manager.
Data Roles for a Network Analysis Object

For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

Basic Data Roles for a Hierarchical Network Analysis Object

The basic data role for a hierarchical network analysis object is **Levels**. The hierarchy in the **Levels** role specifies the nodes of the network analysis.

Basic Data Roles for an Ungrouped Network Analysis Object

The basic data roles for an ungrouped network analysis object are **Source** and **Target**. The **Source** specifies a data item that contains all of the node values for the plot. The **Target** specifies a data item that creates the links between nodes.

The **Target** data item must contain a subset of the values of the **Source** data item.

To represent terminal (target-only) values in an ungrouped network analysis, you can add rows to your data where the terminal value is the value for the source data item and the target data item is missing.

For example, in the following table, the final row represents a terminal value:

<table>
<thead>
<tr>
<th>Employee</th>
<th>Manager</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMP1</td>
<td>MGR1</td>
<td>40000</td>
</tr>
<tr>
<td>EMP2</td>
<td>MGR1</td>
<td>55000</td>
</tr>
<tr>
<td>EMP3</td>
<td>MGR1</td>
<td>50000</td>
</tr>
<tr>
<td>MGR1</td>
<td></td>
<td>75000</td>
</tr>
</tbody>
</table>

Additional Data Roles for a Network Analysis Object

In addition to the basic data roles, you can specify the following data roles for a network analysis:

**Size**

specifies a measure that determines the size of the nodes in the network analysis.

**Note:** You can assign internal network metrics to the **Size** role by using options in your SAS Visual Analytics settings. For more information, see “Modify SAS Visual Analytics Settings” in SAS Visual Analytics: Designing Reports.

**Color**

specifies a data item that determines the color of the nodes in the network.

**Note:** You can assign internal metrics to the **Color** role by using options in your SAS Visual Analytics settings. For more information, see “Modify SAS Visual Analytics Settings” in SAS Visual Analytics: Designing Reports.

**Link width**

specifies a measure that determines the width of the links in the network.

**Link color**

specifies a data item that determines the color of the links in the network.
Label
specifies a data item whose values are displayed inside each node if the **Node labels** option is enabled.

Data tip values
specifies data items whose values are included in the data tips for the network. Measure values are aggregated by sum.

**Options for a Network Analysis Object**

For information about general options, see *Using the Options Pane for Report Objects on page 3.*

In addition to the general options, you can specify object-specific options on the **Options** pane. You can specify the following options under **Network Analysis**:

**Type**
specifies the type of network to display.

- **Hierarchical** uses a hierarchy data item to create the network.
- **Ungrouped** uses a source and a target. A node is created for each value of the source data item, and a link is created from each node to the node that corresponds to the value of the target data item.

**Node labels**
shows the node values as text inside each node.

**Link direction**
specifies whether the links in the network have arrows. Select one of the following values:

- **None** specifies that the links do not have arrows.
- **Source** adds arrows to each link, pointing from the target node to the source node.
- **Target** adds arrows to each link, pointing from the source node to the target node.
- **Both** adds arrows to both ends of each link.

**Detailed link attributes**
displays every link between each pair of nodes. If this option is disabled, then links between nodes are aggregated.

This option also determines whether the links are aggregated in the details table in the explore mode.

**Additional levels**
for hierarchical networks only, specifies the number of levels that are displayed beneath the current level.

You can specify the following options under **Network Layout**:

**Node size**
adjusts the size of all of the nodes in the network.

**Force strength**
specifies the force strength parameter that is used in the force-directed layout algorithm. The force strength parameter specifies the relative strength of local forces to global forces with regard to laying out the positions of nodes and links. In general, a greater value creates more space between the nodes throughout the network.

**Node distance**
specifies the distance parameter that is used in the force-directed layout algorithm. The node distance parameter specifies the maximum distance for which the layout algorithm models global forces between nodes. In general, a larger value creates more space between the nodes throughout the network.
You can specify the following options under **Node Selection**:

**Source node**
- displays the current node selection.

**Predecessors**
- selects the number of levels of predecessors (parents) of the source node to select. 0 specifies the source node. Note that you can specify a range by making multiple selections. For example, select both 0 and 1 to specify that the source node and the first level of predecessors are selected.

**Successors**
- selects the number of levels of successors (children) of the source node to select. 0 specifies the source node. Note that you can specify a range by making multiple selections. For example, select both 0 and 1 to specify that the source node and the first level of successors are selected.

You can specify the following option under **Geographic**:

**Visibility**
- displays the network as an overlay on a geographic map.

*Note:* This option is available only if geographies are assigned to all of the data roles that create nodes. For hierarchical diagrams, all of the **Levels** must be geographies. For ungrouped diagrams, the **Source** and **Target** must be geographies.

**Map service**
- specifies the source for the background map.

*Note:* This option is displayed only if the **Visibility** option is enabled.

## Arrange Nodes in a Network Analysis Object

### Move Nodes

You can move any node in the network by clicking the node, and dragging it. You can move multiple nodes in the network by selecting the nodes that you want to move, and dragging them.

*Note:* The positions of the nodes in your network are saved with your report.

### Refresh the Node Layout

You can refresh your node layout by clicking 🔄. The network creates a new node layout based on your current node layout. This is especially useful after you have moved nodes manually. Refreshing the node layout adjusts the spacing and orientation of your nodes.

## Select Nodes in a Network Analysis Object

You can select nodes in the network by using any of the following methods:

- If the rectangular selection tool is selected, you can select nodes by clicking and dragging.
  - If the rectangular selection tool is not selected, then click 🗑️ in the object toolbar, and then select 🗑️.
- Hold down the Ctrl key, and click the nodes that you want to select.
- Select a series of linked nodes by setting a node as the source node.
  - Select a node, right-click the node, and then select **Set as source for selection**.

In the **Options** pane, specify the range of levels of **Predecessors** (parents) and **Successors** (children) of the source node to select. 0 specifies that the source node is selected.
For example, if you specify a range of 0 to 1 for **Predecessors** and a range of 0 to 2 for **Successors**, then the source node, one level of predecessors, and two levels of successors are selected.

### Control the View of a Network Analysis Object

You can control the view of a network by using the following controls:

<table>
<thead>
<tr>
<th>Control</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Zoom</strong></td>
<td>Zoom in and out at the location of the cursor by scrolling the mouse wheel.</td>
</tr>
<tr>
<td></td>
<td>You can also enable the zoom control by selecting <img src="icon" alt="Zoom In" /> from</td>
</tr>
<tr>
<td></td>
<td>the object toolbar. Click <img src="icon" alt="Zoom In" /> to zoom in, or <img src="icon" alt="Zoom Out" /></td>
</tr>
<tr>
<td></td>
<td>to zoom out.</td>
</tr>
<tr>
<td><strong>Pan (scroll)</strong></td>
<td>If the pan tool is selected, you can pan (scroll) the map by clicking the</td>
</tr>
<tr>
<td></td>
<td>map and dragging it.</td>
</tr>
<tr>
<td></td>
<td>If the pan tool is not selected, then click <img src="icon" alt="Pan" /> in the object</td>
</tr>
<tr>
<td></td>
<td>toolbar, and then select <img src="icon" alt="Pan" />.</td>
</tr>
</tbody>
</table>

### Working with Other Object Types

#### Use a Container Object

**About Container Objects**

You can use containers to group other report objects or prompts. There are these types of containers:

- **Content containers**
  group report objects. Content containers can control the layout of your report. For example, if you choose the stacking layout, then the report objects are displayed as if they are in a slide deck, and only one report object is displayed at a time. If you choose the precision layout, then you have increased control over the size and placement of your objects, and objects can overlap one another.

- **Prompt containers**
  group prompt controls. Prompt containers are affected by report prompts, but not by other page prompts. They are not affected by actions. Report objects inside prompt containers are filtered by the same rules as other objects.

Prompt containers can be added to the report prompt area and page prompt area on the canvas. This enables you to add control types (for example, list controls) that are not otherwise allowed in those prompt areas.

**TIP** If a prompt container is open and there are unsaved changes, then the button bar changes. An **Apply** button is displayed so that you can apply changes.

**Specify Container Options**

1. If it is not already selected, select the container that you want to update from the **Outline** pane.
2 If the Options pane is not already displayed, click .

3 Update the general options for the container, such as the Name and Title.

4 Update the object-specific options for the container. Here are some details about the options for containers:

- By default, the Enable selection in the viewers option is selected for containers. This means that users who use the web viewer or a mobile device can select the container, and click to see the container name and any incoming filter information.
- For containers, the Container type option specifies the layout type for the container. Select one of the following:
  - Default: fits and aligns all of the objects in the container automatically.
  - Stacking: displays the report objects as if they are in a slide deck. Only one report object is displayed at a time. A stacking container has a control bar instead of a scroll bar that lets you move between report objects.
  - Precision: enables you to place, align, and size the report objects within the container. The precision type allows report objects to overlap.
    - With the precision type, you can manipulate the depth of the report objects within the container. Position your mouse pointer over the button, click the drop-down list, and then select Send to front or Send to back.
- If the container type is Stacking, then the Placement option changes the location of the control bar, and the Button type option changes the appearance of the control bar.
- For prompt containers, you can select the Button text and Direction options. The Automatically apply values option is selected by default. If you clear the Automatically apply values check box, then you cannot work with any interactions to or from the prompt container until you apply or cancel changes.

Use an Image

About Images
You can use images to include your corporate logo or other graphics in your reports. You can insert images from your local machine or from the web. You can also add tooltip text to an image.

Insert an Image into a Report

1 Drag Image from the Objects pane, and drop it onto the canvas.

2 Select the image by using one of the following methods:
   - drag a local image file onto the image object in the report.
   - click Choose an Image to select a local image file.
   - in the Enter a URL field, enter the URL of an image on the web.

3 (Optional) Specify the Scale type.

4 (Optional) Specify the Tooltip text.
Specify Image Options

1. If it is not already selected, select the image in the canvas that you want to update.
2. If the Options pane is not already displayed, click.
3. Update the general options for the image, such as the Name and Title.
4. Specify the options that are specific to images:
   - **Scale type**
     - displays how the source image is scaled to the size of the report object. Select one of the following:
     - **None**
       - The actual size of the image is maintained. The image might not fill the entire area of the image's report object. If the image is larger than the report object, then scroll bars are displayed.
     - **Fit width**
       - The width of the image is set to the width of the image’s report object. The height maintains the image’s original aspect ratio. Scroll bars are displayed if the set height of the image is greater than the height of the report object.
     - **Fit height**
       - The height of the image is set to the height of the image's report object. The width maintains the image’s original aspect ratio. Scroll bars are displayed if the set width of the image is greater than the width of the report object.
     - **Fit all**
       - The image is modified to fit best into the image’s report object. The image’s original aspect ratio is maintained.
   - **Stretch**
     - The height and width of image are set to the height and width of the image’s report object. The image’s original aspect ratio is not maintained.
   - **Tile**
     - The image is tiled in the report object. The image’s original size is maintained. There are no scroll bars.
   - **Tooltip text**
     - specifies text that is displayed when you move the cursor over the image.

By default, the Enable selection in the viewers option is not selected for images. This means that users who use the web viewer or a mobile device cannot select the image.

Use a Text Object

About Text Objects

Text objects display static text. You can use text to include company standards, such as text that indicates confidentiality, in your reports. You can have hyperlinks in text. For more information about hyperlinks, see “Create a Link from a Text Object” in SAS Visual Analytics: Working with Report Data. You can also use text to annotate other objects in a report.

Starting in the 8.1 release, SAS Visual Analytics automatically computes the height and width of any text object when the report is rendered. This makes reports more portable across various screen sizes. For example, the height of a text object might be 10% of your report height on one screen, and 5% of your report height on another screen. If you want a text object to always be a fixed percentage of the report’s height and width on any screen, you can use the Specify width and Specify height options on the Options pane.
Specify Text Object Options

1. If it is not already selected, select the text object in the canvas that you want to update.

2. If the Options pane is not already displayed, click .

3. Update the general options for the text object, such as Name and Title.

   By default, the Enable selection in the viewers option is not selected for text objects. This means that users who view the report in the web viewer or a mobile device cannot select the text in a report.

Specify Text Object Styles

When you edit the text for a text object, a floating toolbar appears. You can use the floating toolbar to change style options such as the font and the paragraph alignment. You can also use the floating toolbar to create a link from a text object. For more information, see “Create a Link from a Text Object” in SAS Visual Analytics: Working with Report Data.

**TIP** You can use the pop-up menu to cut, copy, paste, and delete text.

Use Web Content

A web content object displays a web page or embedded video content in an inline frame (iframe).

**Note:** Some web content is configured so that it cannot be displayed in an inline frame. This content cannot be displayed in a web content object.

To insert a web content object into a report:

1. Drag Web Content from the Objects pane, and drop it onto the canvas.

2. In the Options pane, specify the URL that you want to display.

**Note:** Clicking the content inside a web content object does not select the web content object within SAS Visual Analytics. You can select the web content object by using the Outline pane.

Working with Pie Charts

About Pie Charts

A pie chart displays a part-to-whole relationship in a circle divided into multiple slices for each value of a category data item based on a single measure data item. Each slice represents the relative contribution of each part to the whole. In a pie chart, the legend is sorted by contribution.

Here are some key points about pie charts:

- Starting in the 8.1 release, the default pie chart is a donut chart.
- A pie chart does not show a slice with a missing or zero response.
- The Other slice does not display data tip values. In addition, the Other slice always sums the included values, regardless of the aggregation method selected for the measure. For example, if the aggregation method selected is Count, then the Other slice displays the sum of the individual counts.
Data Roles for a Pie Chart

For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

The basic data roles for a pie chart are categories and measures. You can assign one category only, and the category values divide the pie chart into slices (segments). You can assign multiple measures, and the measure values determine the size of each slice of the pie. If the pie chart contains no measures, then the frequency of the category values determines the size of the slices in the pie.

In addition to the basic data roles, you can assign these roles:

Group
creates individual pie charts for each value of the category data item that you assign. Depending on the value that you selected for the Grouping style property, the pie charts for each group value are displayed either as a set of stacked rings or as multiple separate charts.

Note: Grouping is not available if you assign multiple measures to the report object.

Lattice columns
creates a lattice of charts with a column for each value of the category data item that you assign.

Lattice rows
creates a lattice of charts with a row for each value of the category data item that you assign.

Data tip values
specifies data items whose values are included in the data tips for the chart. Measure values are aggregated by sum.

Animation
specifies a datetime data item that is used to animate the pie chart.

If you assign the Animation data role, then the ▶ icon appears at the bottom left corner of the report object. Click ▶ to start the animation.

Options for a Pie Chart

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the Options pane:

Show label
displays the names of the measures in the chart.

Show category labels
displays the category values in the chart.

Show actual values
displays the measure values in the chart.

Show percent of total values
displays the measure values in the chart as a percentage of the total.

Data label location
specifies where the data labels are placed. Select one of the following values:

Auto
places the labels automatically based on the space available. SAS Visual Analytics first tries to place the label inside the slice. If there is not enough space to place the label inside a slice, then the label is placed outside the slice. There might be a case in which the space is so small, the label is dropped completely.
TIP If the labels on a chart are not displayed when Auto is selected for the Data label location option, try increasing the Ring width option. A wider ring has more space for data labels.

Callout places the labels outside of the chart with a line connecting each label to the slice that it represents.

Inside places the labels inside each slice of the chart.

Outside places the labels outside of the chart.

Note: The Callout and Outside selections for Data label location are not supported for a grouped pie chart.

Grouping style specifies how the values are displayed when the Group data role is assigned or when there are multiple measures assigned to the plot.

Select one of the following values:

Multiples displays the pie charts for the group values or measures as multiple separate charts.

Stack displays the pie charts for the group values or measures as a set of stacked rings.

Start point offsets the layout of the pie chart by the specified value, in degrees.

Direction specifies whether the pie slices are laid out clockwise or counterclockwise. The slices are laid out in descending order.

Show “Other” slice groups small values together into a slice labeled “Other.” The Minimum percentage for “Other” slice option specifies the threshold for this grouping.

Note: If the Show “Other” slice option is selected for a pie chart, and the All Other option is selected for a category-specific rank, then the rank is not displayed.

Minimum percentage for “Other” slice specifies the threshold percentage for a distinct value to be displayed as a separate slice. Any values that are smaller than the specified percentage are grouped together into a slice labeled “Other.”

Chart style specifies whether the chart displays as a pie chart or a donut chart.

Ring width specifies the size of the hole at the center of the donut chart. This width is limited by the amount of space that is required to draw the ring or rings for the donut chart. By default, the donut hole is 70%, so the Ring width is 30%.

Donut hole label specifies whether the label is displayed in the center of the donut chart.
Working with Scatter Plots

About Scatter Plots
A scatter plot displays the values of measures by using markers. When you apply more than two measures, the report object displays a scatter plot matrix. A scatter plot matrix is a series of scatter plots that display every possible pairing of the measures that are applied to the plot.

Data Roles for a Scatter Plot
For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

The basic data role for a scatter plot is a measure. You can assign any number of measures. If you assign a single measure to a scatter plot, then the values are plotted along a line.

In addition to measures, you can assign these roles:

- **Color**: colors the points in the plot according to the values of the category data item that you assign.
- **Lattice columns**: creates a lattice of plots with a column for each value of the category data item that you assign.
- **Lattice rows**: creates a lattice of plots with a row for each value of the category data item that you assign.
- **Data tip values**: specifies data items whose values are included in the data tips for the plot. Measure values are aggregated by sum.

Options for a Scatter Plot
For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the Options pane. You can specify the following options under **Scatter Plot**:

- **Initial marker shape**: specifies the shape for the markers. If the Color role is assigned, then multiple marker shapes might be used, depending on the number of values for the category for the Color role. The marker shape that you specify is used for the first set of values.

- **Marker size**: specifies the size of each marker in pixels.

- **Use filled markers**: specifies whether the markers are filled or hollow.

- **Transparency**: specifies the amount of transparency for the markers.

You can specify the following options under **Fit Line**:

- **Type**: specifies the type of fit line to display. For information about the fit types that are available, see Applying Data Analysis on page 48.
Transparency
specifies the amount of transparency for the fit line.

Applying Data Analysis
For scatter plots, you can apply the following data analyses:

Correlation
identifies the degree of statistical correlation between the variables in the plot. The strength of a correlation is described as a number between -1 and 1. A value that is close to -1 implies a strong negative correlation, a value that is close to 0 implies little or no correlation, and a value that is close to 1 implies a strong positive correlation.

Correlation is applied to your plot automatically when you add a linear fit line. It is not available with other fit types. The correlation value is displayed in the details table for the object. To see the details table, view the object in explore mode. See Viewing Report Objects in Explore Mode on page 7.

Fit Line
plots a model of the relationship between the variables in the plot.

You can select any of the following fit types:

Best Fit
selects the most appropriate model (linear, quadratic, or cubic) for your data. The Best Fit method uses backward variable selection to select the highest-order model that is significant. To see the final model that was used, view the object in explore mode.

Linear
creates a linear fit line from a linear regression algorithm. A linear fit line produces the straight line that best represents the relationship between two measures.

For a linear fit, correlation is automatically added to the plot. Correlation is not available with other fit types.

Quadratic
creates a quadratic fit line. A quadratic fit produces a line with a single curve. A quadratic fit line often produces a line with the shape of a parabola.

Cubic
creates a cubic fit line. A cubic fit line produces a line with two curves. A cubic fit line often produces a line with an “S” shape.

PSpline
creates a penalized B-spline. A penalized B-spline is a smoothing spline that fits the data closely. A penalized B-spline can display a complex line with many changes in its curvature.

Detailed information about the data analyses for your report object is available in the details table for the object. To see the details table, view the object in explore mode. See Viewing Report Objects in Explore Mode on page 7.

Working with Targeted Bar Charts

About Targeted Bar Charts
A targeted bar chart displays a bar chart with a target value. The height of each bar represents the value and a line represents the target value for each bar.

By default, a bar chart is sorted in descending order by the value of the measure.

Note: If the chart contains a rank, then, by default, the data is sorted based on the values of the rank.
Data Roles for a Targeted Bar Chart

For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

The basic data roles for a targeted bar chart are the category, the measure, and the target.

In addition to the basic data roles, you can assign these roles:

**Lattice columns**
- Creates a lattice of charts with a column for each value of the category data item that you assign.

**Lattice rows**
- Creates a lattice of charts with a row for each value of the category data item that you assign.

**Data tip values**
- Specifies data items whose values are included in the data tips for the chart. Measure values are aggregated by sum.

**Animation**
- Specifies a datetime data item that is used to animate the chart.

If you assign the **Animation** data role, then the ▶ icon appears at the bottom left corner of the report object. Click ▶ to start the animation.

Options for a Targeted Bar Chart

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the **Options** pane:

**Show data labels**
- Shows the data values as text in the chart.

**Note:** You can always view a data value as a data tip when you position the cursor over a data value.

**Bar direction**
- Specifies whether the bars are vertical ▲ or horizontal ▶.

**Fixed baseline**
- Specifies the baseline value for the bar chart.

**Transparency**
- Specifies the amount of transparency for the bars.

**Combine excluded rows into “All Other”**
- Summarizes all excluded rows. This option is available when you use summarized data, and it applies to both ranks and post-aggregate filters. The effect of this option can be influenced by certain types of actions. For more information, see Use the Combine Excluded into “All Other” Option on page 6.

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Working with Text Topics

About Text Topics

A text topics object displays a set of words from a character data item. The size of each word in the cloud indicates the importance (topic term weight) of the word.
A text topics object analyzes each value in a document collection as a text document that can contain multiple words. Words that often appear together in the document collection are identified as topics. For the selected topic, the text topics object displays the terms with the greatest topic term weight values. The topic term weight indicates the importance of the term within the topic.

A text topics object can also display whether the documents in a topic express positive, negative, or neutral sentiment.

The Documents table and the details table (in explore mode) contain additional information about the terms, topics, and documents in the text topics object. For more information, see Explore Text Topics Results on page 52.

To enable text topics, you must set a unique row identifier for your data source. For more information, see Set the Unique Identifier Column for Your Data on page 52.

Note: Text topics objects can display English or German text only.

Note: Depending on the number of rows in your data source and the length of the values in your document collection, a text topics object might require a significant amount of time to display.

Note: Text topics objects in SAS Visual Analytics use a different algorithm from SAS Text Miner. Your results might be different from the results that SAS Text Miner produces.

**Data Roles for a Text Topics Object**

For information about setting data roles, see “Working with Data Role Assignments” in SAS Visual Analytics: Working with Report Data.

For a text topics object, the basic role is a Document collection. A document collection is a category data item that contains the words that you will analyze. You must also specify the Data source language for the document collection.

Note: To enable text topics, you must set a unique row identifier for your data source. See Set the Unique Identifier Column for Your Data on page 52.

In addition to the basic role, you can specify the following role:

**Document details**

- specifies data items that are displayed as columns in the Documents table at the bottom of the report object.

**Options for a Text Topics Object**

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the Options pane. You can specify the following options under Text Topics:

**Analyze document sentiment**

- enables sentiment analysis for the terms.

  Sentiment analysis determines whether a document has a positive sentiment, negative sentiment, or neutral sentiment based on the content of the document.

  When sentiment analysis is enabled, the topics chat displays the number of positive, neutral, and negative documents in each topic. In addition, sentiment values are displayed in the Documents table.

**Identify term roles**

- identifies terms by their parts of speech. In addition, this option identifies groups of nouns as single terms and identifies text entities such as names, addresses, telephone numbers, and so on.

  Note: This option is equivalent to the advanced options Include parts of speech, Extract noun groups, and Use entity extraction.
Maximum topics
specifies the maximum number of topics to create. Specify a number from 2 to 20.

You can specify the following additional advanced options:

Resolution
specifies the resolution that is used to identify topics. A Low resolution identifies fewer topics. A High resolution identifies more topics.

Cell weight
specifies whether to weight the frequency of each term for every document that it appears in. Selecting Logarithmic de-emphasizes terms that appear many times in relatively few documents.

Term weight
specifies a weighting algorithm for the terms in the document collection. The Entropy weighting algorithm emphasizes terms that have a low frequency across the document collection.

Document threshold
specifies the minimum number of documents that a term must appear in. Specify a number from 1 to 20. If a term does not appear in the minimum number of documents, then it is not included in the word cloud.

Topic label length
specifies the number of terms that are included in a topic name. Specify a number from 2 to 8. This property does not affect the number of terms that are used to select topics—only the topic names are changed.

Include parts of speech
specifies that terms are classified by parts of speech (for example, a noun, a verb, or an adjective). The part of speech for each term is displayed in the data tip for the term.

Extract noun groups
specifies whether to identify groups of nouns as terms.

Use entity extraction
specifies whether to identify text entities such as names, addresses, telephone numbers, and so on. If this option is disabled, then text entities are not treated differently from other text.

Stem words
specifies whether all forms of a given word are identified as a single term. For example, if you select Stem words, then the words "sell," "sells," "selling," and "sold" are identified as a single term "sell."

Use stop list (if available)
specifies whether to use a stop list to exclude common words such as “the,” “with,” and “is” when identifying terms. If no stop list is available, then a message appears at the bottom of the word cloud.

You can specify the following options under Document Display Criteria:

Minimum relevance
specifies the minimum relevance value for a document to be displayed.

Show positive documents
displays documents that have positive sentiment.

Show neutral documents
displays documents that have neutral sentiment.

Show negative documents
displays documents that have negative sentiment.
Explore Text Topics Results

Documents Table Results
The Documents table displays each of the documents that contains the selected term. For each document, the Relevance value indicates how relevant the document is to the current topic.

Note: If your data contains a small number of strong topics, then topics with zero documents might be displayed.

If sentiment analysis is enabled, then the Sentiment value identifies how positive or negative the document is. You can filter the documents to exclude documents with positive, negative, or neutral sentiment.

Note: You can sort any numeric column by clicking the column heading.

Details Table Results in Explore Mode
In the explore mode, the details table contains the following tabs:

Terms
- displays all of the terms in the current topic. For each term, the Topic Weight value indicates the importance of the term in the current topic.
  
  If the Identify term roles property or the Include parts of speech property is enabled, then the Role value identifies the grammatical role of each term.
  
  Note: You can sort any column by clicking the column heading.

Topics
- displays all of the topics in the document collection. If sentiment analysis is enabled, then the number of positive, neutral, and negative documents for each topic is displayed.
  
  Note: You can sort any column by clicking the column heading.

Set the Unique Identifier Column for Your Data
Text topics report objects require that a unique identifier column be assigned for your data source. The unique identifier column contains a value that is unique for each row of your data source.

To set the unique identifier column for a data source:

1. In the Data pane, click Add, and then select Set unique identifier column. The Select Unique Identifier Column window appears.

2. Select a data item to use as the identifier column. If none of the data items in your data source have unique values for every row, then a message is displayed.

Working with Time Series Plots

About Time Series Plots
A time series plot displays data over time by using a line that connects the data values. If you assign multiple measures to a time series plot, then you can create separate Y axes for each measure.
Data Roles for a Time Series Plot

For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

The basic data roles for a time series plot are the time axis and measures. You can assign one datetime data item only to the time axis. You can assign many measures, and the measure values are plotted on the response axis.

In addition to the basic data roles, you can assign these roles:

Group
- groups the data based on the values of the datetime data item that you assign. A separate line is created for each data value.
  
  **Note:** Grouping is not available if you assign multiple measures to the plot.
  
  **Note:** Grouping is not available if you enable forecasting.

Data tip values
- specifies data items whose values are included in the data tips for the plot. Measure values are aggregated by sum.
  
  **Note:** This option is not available if you enable forecasting.

Show forecast
- enables forecasting for the line chart. Forecasting estimates future values for your data based on statistical trends.
  
  **Note:** Forecasting is not available if the Group role is assigned.

Underlying factors
- adds additional measures to the forecast as underlying factors. The forecasting model evaluates the additional measures to determine whether they contribute to the accuracy of the forecast. If the additional measures do not increase the accuracy of the forecast, then they are not used. If the additional measures do increase the accuracy of the forecast, then the forecast line is adjusted, and the confidence bands are narrowed.
  
  The measures that you add as underlying factors can also be used in a scenario analysis.
  
  **Note:** This option is available only if forecasting is enabled.

Options for a Time Series Plot

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the Options pane:

Show data labels
- shows the data values as text in the plot.
  
  **Note:** You can always view a data value as a data tip when you position the cursor over a data value.

Grouping style
- specifies the grouping style for the lines in the plot.
  
  Overlay unfilled
  - displays the lines without color fills.

  Overlay filled
  - displays the lines with a transparent color fill.
Line thickness
specifies the thickness of the line.

Show markers
shows markers for the data points in the plot.

Marker size
specifies the size of the markers in the plot.

Use filled markers
specifies whether the markers in the plot are filled.

Binning interval
specifies interval between datetime values in the plot. Select one of the following values:

  Automatic
  automatically determines the best interval for the plot.

  Fixed count
plots a specific number of equally spaced values. Specify the number of values in the Fixed bin count option.

  Note: This selection is unavailable if forecasting is enabled.

Use format
plots all of the datetime values as rendered by the data format.

Fixed bin count
specifies the number of datetime values to plot.

  Note: This option is available only if Binning interval is set to Fixed count.

Show forecast
enables forecasting for the plot.

  Note: Forecasting is not available if the Group role is assigned.

Transparency
specifies the amount of transparency for the plot.

Measure layout
specifies whether the measures share a single response axis (Shared axis) or have separate response axes for each measure (Separate axes).

If forecasting is enabled, then the following additional options are available:

Confidence interval
specifies the degree of confidence for the confidence band.

Forecast horizon
specifies the number of data intervals to forecast.

Forecasting

About Forecasting
Forecasting uses the statistical trends in your data source to predict future data values.

A forecast adds a line with predicted values to your plot and a colored band that represents the confidence interval. For example, a 95% confidence interval is the data range where the forecasting model is 95% confident what the future values will be.

SAS Visual Analytics automatically tests multiple forecasting models against your data, and then selects the best model. To see which forecasting model was used, see the details table in the explore mode.
The forecast model can be any one of the following:
- Damped-trend exponential smoothing
- Linear exponential smoothing
- Seasonal exponential smoothing
- Simple exponential smoothing
- Winters method (additive)
- Winters method (multiplicative)

Note: Forecasting accounts for cyclical patterns by using standard intervals of time (for example, 60 minutes in an hour, 24 hours in a day, and so on). If your data uses nonstandard intervals (for example, 48 30-minute cycles per day), then cyclical patterns are not considered in the forecast.

Enable Forecasting
To add forecasting to a time series plot, select Show forecast in the Roles pane.

In the Options pane for the time series plot, you can adjust the number of data values to predict by using the Forecast horizon option. You can specify the degree of confidence for the confidence band by using the Confidence interval option.

In the Roles pane, you can add additional measures to the forecast as Underlying factors. The forecasting model evaluates the additional measures to determine whether they contribute to the accuracy of the forecast. If the additional measures do not increase the accuracy of the forecast, then they are not used. If the additional measures do increase the accuracy of the forecast, then the forecast line is adjusted, and the confidence bands are narrowed.

The measures that you use as underlying factors can also be used in scenario analysis and goal seeking. For more information, see Working with Scenario Analysis and Goal Seeking on page 55.

Working with Scenario Analysis and Goal Seeking

About Scenario Analysis and Goal Seeking
Scenario analysis enables you to forecast hypothetical scenarios by specifying the future values for one or more underlying factors that contribute to the forecast.

For example, if you forecast the profit of a company, and material cost is an underlying factor, then you might use scenario analysis to determine how the forecasted profit would change if the material cost increased by 10%.

In addition to scenario analysis, you can perform goal seeking. Goal seeking enables you to specify a target value for your forecast measure, and then determine the values of your underlying factors that would be required to achieve the target value.

For example, if you forecast the profit of a company, and material cost is an underlying factor, then you might use goal seeking to determine what value for material cost would be required to achieve a 10% increase in profit.

Scenario analysis and goal seeking can be used together in the same forecast.

Apply Scenario Analysis and Goal Seeking to a Forecast
To apply scenario analysis and goal seeking:

1. In the Roles pane, click What If. The What-If Analysis window appears.

   Note: The What If button is available only if one or more underlying factors contribute to the forecast.
For the forecast measure and for each of the measures that are assigned to the forecast as underlying factors, a table displays the values of the measures.

To perform scenario analysis, select **Scenario Analysis**, and then set the future values for the underlying factors.

To perform goal seeking, select **Goal Seeking**, and then set the target future values for the forecast measure.

You can set the values by using any of the following methods:

- enter the value for each data point.
- set all of the values for the measure. Click , and select **Set series values**. The Set Series Values window enables you to set all of the values to a specific value or to adjust the future values relative to the forecasted values of the measure.

**Note:** The **Progressively by** option increments future values by the amount that you specify. For example, if you specify 100, then the first future value is increased by 100, the second future value is increased by 200, the third future value is increased by 300, and so on.

**Note:** If you change future values for either scenario analysis or goal seeking, you must apply your changes before you can change future values for a different analysis type.

To reset all of the data points for a measure, click , and then select **Reset series**. The Reset Series window appears. Select the measure that you want to reset, and then click **OK**.

(Optional) If you perform goal seeking, you can set bounds for each underlying factor to limit the minimum and maximum values that are possible.

Click **Add bounds**, and then specify the minimum values in the **Lower Bound** column and the maximum values in the **Upper Bound** column.

When you are finished setting the future values for the what-if scenario, click **Apply** to apply the scenario to the forecast.

The forecast is updated to show the results of the scenario.

### Remove Scenario Analysis and Goal Seeking from Your Forecast

To remove the scenario analysis and goal seeking from a forecast, follow these steps:

1. In the **Roles** pane, select **What If**. The What-If Analysis window appears.
2. Click , and then select **Start over** to remove all changes to the original forecast.

The forecast is updated automatically.

### Working with Treemaps

#### About Treemaps

A treemap displays a hierarchy or a category as a set of rectangular tiles. Each tile represents a category value or a hierarchy node. The size of each tile represents either the frequency count or the value of a measure. If you assign a measure to the **Color** role, then the color of each tile represents the value of that measure.
Data Roles for a Treemap

For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

The basic data roles for a treemap are:

**Tile**
- specifies a category or a hierarchy that is used to create the tiles in the treemap.

**Size**
- specifies a measure that determines the size of each tile. If you do not specify the **Size** role, then the tile size is determined by the frequency count.

  **Note:** If any of the aggregated values for the **Size** role results in a negative size value or a value of zero, then an error appears.

**Color**
- specifies a measure that determines the color of the tiles.

**Data tip values**
- specifies data items whose values are included in the data tips for the chart. Measure values are aggregated by sum.

Options for a Treemap

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the **Options** pane:

**Show data labels**
- shows a text label for each tile in the treemap.

**Text style**
- specifies style options for the labels in the treemap.

**Arrangement**
- specifies the layout of the tiles in the treemap. Select one of the following values:

  **Flow**
  - arranges the tiles from largest to smallest, with the largest tile at the top left.

  **Standard**
  - arranges the tiles into squares, with the largest tiles generally at the bottom left.

  **Toggle**
  - arranges the tiles into a single row or column, with the largest tile on the left or at the top.

  The orientation of the tiles alternates between hierarchy levels. The top level is arranged as a row, the second level is a column, and so on.

**Show level indicator**
- displays the name of the category or the selected hierarchy level above the treemap.
Working with Waterfall Charts

About Waterfall Charts
A waterfall chart (also known as a progressive bar chart) shows how the initial value of a measure increases or decreases during a series of operations or transactions. The first bar begins at the initial value, and each subsequent bar begins where the previous bar ends. The length and direction of a bar indicate the magnitude and type (positive or negative, for example) of the operation or transaction. The resulting chart is a stepped bar showing how incremental changes lead to the final value of the measure.

Data Roles for a Waterfall Chart

For information about setting data roles, see "Working with Data Role Assignments" in SAS Visual Analytics: Working with Report Data.

The basic data roles for a waterfall chart are a category and a measure. You can assign one category only, and the category values are plotted on the category axis. You can assign one measure only, and the measure values are plotted on the response axis. If a waterfall chart contains no measures, then the frequency of the category values is plotted on the response axis.

In addition to the basic data roles, you can assign these roles:

- **Lattice columns** creates a lattice of charts with a column for each value of the category data item that you assign.
- **Lattice rows** creates a lattice of charts with a row for each value of the category data item that you assign.
- **Data tip values** specifies data items whose values are included in the data tips for the chart. Measure values are aggregated by sum.

Options for a Waterfall Chart

For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the Options pane:

- **Color by response sign** colors the bars based on whether the measure values are positive or negative.
- **Show data labels** shows the data values as text in the chart.
  
  **Note:** You can always view a data value as a data tip when you position the cursor over a data value.
- **Show trend line** adds a trend line connecting each of the bars in the chart.
- **Fixed baseline** specifies the baseline value for the chart.
- **Set initial value** adds a bar with an initial value for the chart. You can specify the custom value for the initial bar.
- **Customize initial label** enables you to specify the label for the initial bar.
Show final (cumulative) bar
adds a final, cumulative bar to the chart.

Customize final label
enables you to specify the label for the final bar.

Transparency
specifies the amount of transparency for the bars.

Sort Data Values
By default, a waterfall chart is sorted in descending order by the value of the first measure. To change the sorting, right-click on the data item on which you want to sort, and then select Sort → sort-method.

Note: If the chart contains a rank, then, by default, the data is sorted based on the values of the rank.

Working with Word Clouds

About Word Clouds
A word cloud analyzes each value in a category data item as a single text string. The size of each word in the cloud can indicate either the frequency of that word or the value of a measure. The color of each word can indicate the value of a measure.

Data Roles for a Word Cloud
For information about setting data roles, see “Working with Data Role Assignments” in SAS Visual Analytics: Working with Report Data.

The basic role for a word cloud is Word. Specify a category whose values are used in the word cloud.

In addition to the basic role, you can specify these roles:

Size
specifies a measure that determines the size of each word. If you do not specify a measure, then the word size indicates the frequency of each word.

Color
specifies a measure that determines the color of each word.

Options for a Word Cloud
For information about general options, see Using the Options Pane for Report Objects on page 3.

In addition to the general options, you can specify the following object-specific options on the Options pane:

Arrangement
specifies whether the words are arranged as a Cloud or in Rows.

Word display limit
specifies the maximum number of words that are displayed in the word cloud.

Font scale
specifies the amount of difference in font sizes between the largest and smallest words in the cloud. The number value specifies the ratio in points of the largest font size to the smallest font size.