Chapter 1

Overview of SAS/GRAPH Network Visualization Workshop

Introduction to SAS/GRAPH Network Visualization Workshop

SAS/GRAPH Network Visualization Workshop is an interactive, graphics-oriented application for visualizing and investigating data. The application uses visualization techniques that enable you to detect patterns and extract information that might be concealed, often in very large quantities of data. SAS/GRAPH Network Visualization Workshop is particularly useful for examining network data (that is, data that is structured into nodes and links that connect the nodes). SAS/GRAPH Network Visualization Workshop is one of the SAS/GRAPH suite of products and requires SAS/GRAPH to be installed on the system.

Here are the major tasks that you can perform:

* explore both network and non-network relational data

* render data in any of five different types of statistical graph: bar charts, box plots, histograms, pie charts, and scatter plots

* render network data in any of five layout patterns: circular, hierarchical, hexagonal, multi-level force, and fixed position

* explore and manipulate data in data tables (for example, by sorting the data)

* visualize and manipulate data in graphs using tools such as the zoom and lens tool

* use a combination of data tables, statistical graphics, and network graphs to selectively view and filter your data

* use different selection modes on your data tables, statistical graphics, and network graphs to graphically subset data at multiple levels

- save your data tables and associated graphs as projects that can be reopened with a single menu command

See Also

Accessibility Features of SAS/GRAPH Network Visualization Workshop

About the Accessibility Features

SAS/GRAPH Network Visualization Workshop includes accessibility and compatibility features that improve usability of the product for users with disabilities, with exceptions noted below. These features are related to accessibility standards for electronic information technology that were adopted by the U.S. Government under Section 508 of the U.S. Rehabilitation Act of 1973, as amended.

If you have questions or concerns about the accessibility of SAS products, send e-mail to **accessibility@sas.com**.

Standard Keyboard Navigation

SAS/GRAPH Network Visualization Workshop can be navigated by using the keyboard. The following table includes some guidelines:

Table 1.1 Standard Keyboard Navigation

Task	Keyboard Control
Move forward through graph and table windows	CTRL + TAB
Move backward through graph and table windows	CTRL + SHIFT + TAB
Move forward through controls on a window or cells in a table	TAB
Move backward through controls or cells in a table	SHIFT + TAB
Display menus when they have focus	DOWN ARROW
Display the right-click menu in a graph window that has focus Display the right-click menu in a table window when a variable or observation is selected	SHIFT + F10
Select a variable in a table that has focus	CTRL + SPACE BAR

Task	Keyboard Control
Select an observation in a table that has focus	SHIFT + SPACE BAR
Display the contents of drop-down lists	ALT + DOWN ARROW
Scroll through the contents of drop-down lists or right-click menus	DOWN ARROW and UP ARROW
Select check boxes when they have focus	SPACEBAR
Select a different radio button when a radio button has focus	DOWN ARROW, UP ARROW, RIGHT ARROW, and LEFT ARROW

Known Issue with Screen Readers

Most interface elements, including menu bar options and shortcut keys, are read by a screen reader. However, not all elements are read. For example, the screen reader does not read the title of the data table window.

Start SAS/GRAPH Network Visualization Workshop

To start SAS/GRAPH Network Visualization Workshop, select **Start** ⇨ **Programs** ⇨ **SAS** ⇨ **SAS GRAPH NV Workshop 2.1**.

Getting Started with Network Visualization

SAS/GRAPH Network Visualization Workshop assumes that the network to be investigated is described by two data sets:

• One data set contains information about the nodes in the network.

• A second data set contains information about the links that connect the nodes.

   Note: If only link data is available, SAS/GRAPH Network Visualization Workshop can generate a simple node data set from the link data.

For information about these data sets, see "About Data Sources" on page 5.

For a summary of the main tasks associated with network visualization, see "Main Steps for Visualizing Network Data" on page 4.

SAS/GRAPH Network Visualization Workshop is installed with several sample data sets. The following topics describe the samples and provide example use cases that can help you learn to use the product:

• "Using the Sample Data" on page 81

• "Example Use Case: Credit Card Fraud" on page 87

- "Example Use Case: Fortune 100 Boards of Directors" on page 93
- "Example Use Case: Web Path Data" on page 101

Main Steps for Visualizing Network Data

There are multiple ways to investigate network data, and your approach can vary from what is described here. In general though, a typical session might consist of the following steps:

1. Load your node and link data into SAS/GRAPH Network Visualization Workshop. For instructions, see "Load Data into SAS/GRAPH Network Visualization Workshop" on page 7.

2. Use the Edit Data Attributes dialog box to identify the FROM and TO variables in the link data set and the NODE variable in the node data set. When you set data attributes, you can also specify which variables to use for link colors as well as for node colors, shapes, and labels. For more information, see "Specify Data Attributes" on page 9.

3. Create one or more statistical graphs to see standard relational views of node and link data separately. For instructions, see "Create a Statistical Graph" on page 30.

4. Create one or more network graphs to see the network of nodes and links. For instructions, see "Create a Network Graph" on page 55.

   You choose from several layout patterns when you create a network graph. You might not initially be aware of any underlying structure in your data. It can be helpful to try multiple layout patterns to determine which are the most useful for the network being investigated. After creating the graph, you can later change its layout.

5. Explore and investigate your data. You can investigate data in the following ways:

   - Explore and manipulate data in the data tables, for example, by sorting the data.

   - Use a combination of statistical graphics, network graphs, and data tables to selectively view and filter your data. To filter the data, select individual observations or groups of observations in a data table or in a graph. The observations are automatically selected in all graphs and data tables. You can also use local selection mode to graphically subset data at multiple levels.

   - Use the tools available to help visualize the graphs. For example, you can zoom in on a portion of a graph or apply a magnifying lens to a network graph. You can also show the labels for particular nodes in a network graph.

6. You might want to change the appearance and behaviors associated with a graph by changing the graph's properties. For example, the properties of a statistical graph determine the graph's colors, whether and where the graph displays titles or a legend, and more. For more information, see "Changing the Properties of a Statistical Graph" on page 31 and "Changing the Properties of a Network Graph" on page 57.

7. Save your data as a project so that you can easily reopen the data tables and associated graphs. For instructions, see "Save a Project" on page 77.