

Chapter 36

Contour Plot

Chapter Table of Contents

| | |
|----------------------------|-----|
| VARIABLES | 504 |
| METHOD | 505 |
| OUTPUT | 506 |

Chapter 36

Contour Plot

A *contour plot* is a graphic representation of the relationships among three numeric variables in two dimensions. Two variables are for X and Y axes, and a third variable Z is for contour levels. The contour levels are plotted as curves; the area between curves can be color coded to indicate interpolated values.

You can interactively identify, label, color, and move contour levels, and change the resolutions of rectangular grids to get better contouring quality and performance. You can choose linear interpolation or thin-plate smoothing spline to fit contour surface functions.

You can also toggle, identify and label observations in the contour plot, control the orientation of the plot, and control the information shown on the axes.

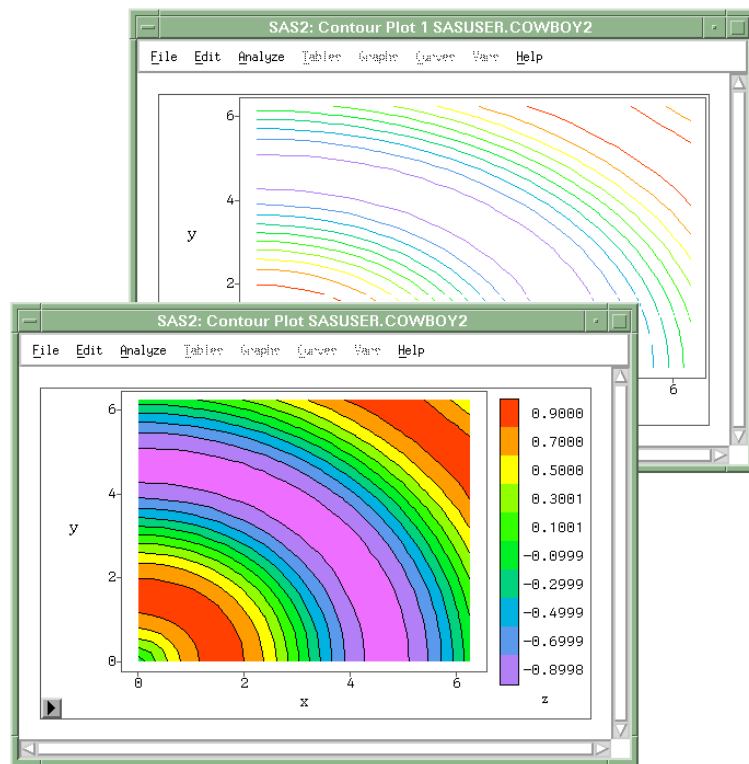


Figure 36.1. Contour Plot

Variables

To create a contour plot, choose **Analyze:Contour Plot (Z Y X)**. If you have already selected three or more numeric variables, a contour plot for each unique triplet of variables appears. If you have not selected any variables, a variables dialog appears.

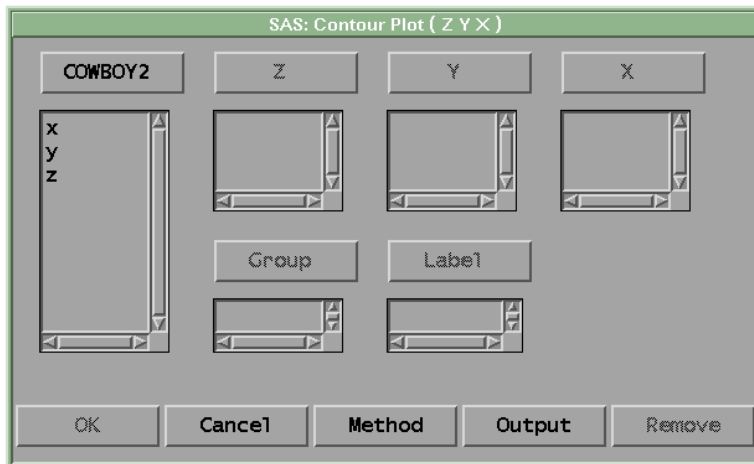


Figure 36.2. Contour Plot Variables Dialog

In the dialog, select at least one **Z**, **Y**, **X** variable. If you select more than three variables, you obtain a matrix of contour plots. If the **X** variable and **Y** variable are the same, you get a plot without contours.

You can select one or more **Group** variables if you have grouped data. This creates contour plots for each group.

You can select a **Label** variable for labeling observations in the plots.

Method

Observations that have missing values for any of the **Z**, **Y**, **X** variables are not used.

If two or more observations have the same (x, y) values, their mean Z value is used as the Z value at point (x, y) .

Clicking on the **Method** button in the variable dialog displays the dialog in Figure 36.3.

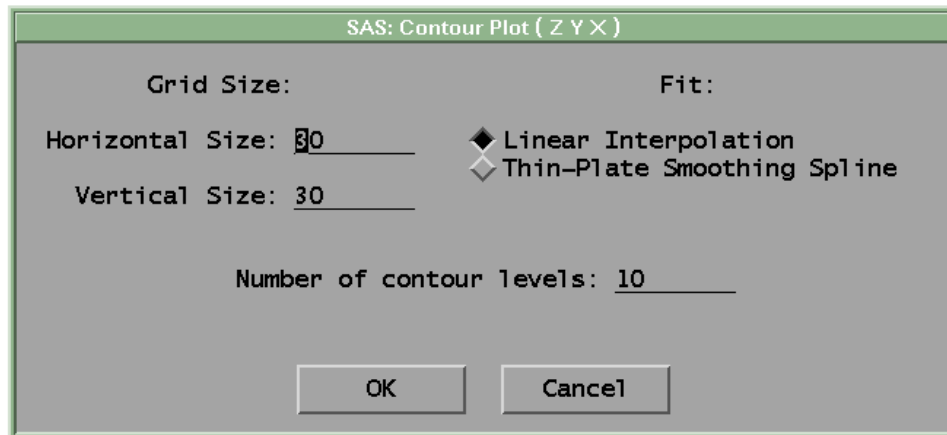


Figure 36.3. Contour Plot Method Dialog

| | |
|--|---|
| Grid Size: | specifies the horizontal resolution of the rectangular grid over which contour function is evaluated. |
| Horizontal Size | |
| Grid Size: | specifies the vertical resolution of the rectangular grid over which contour function is evaluated. |
| Vertical Size | |
| Fit:Linear Interpolation | linearly interpolates contour function across rectangular grid cells. |
| Fit:Thin-Plate Smoothing Spline | fits contour function over rectangular grid using thin-plate smoothing spline fitting. The process may be much slower than linear interpolation. It usually produces very smooth contours. See “Smoothing Spline Surface Plot” in Chapter 39, “Fit Analyses,” for more information on thin-plate splines. |
| Number of Contour Levels | specifies the number of contour levels to be drawn in a contour plot. The contour levels are initially spaced evenly within the range of the Z variable. |

Output

To view or modify output options associated with your contour plot, click on the **Output** button of the rotating plot variables dialog. This displays the options dialog in Figure 36.4.

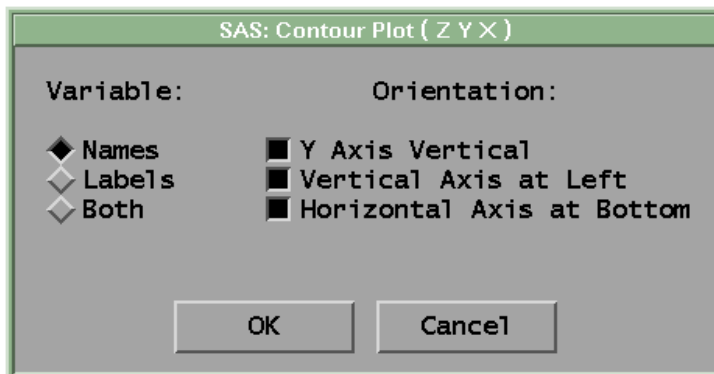


Figure 36.4. Contour Plot Output Options Dialog

| | |
|---|---|
| Variable:Names | labels the axes with variable names. |
| Variable:Labels | labels the axes with variable labels. |
| Variable:Both | labels the axes with both names and labels. |
| Orientation: Y Axis Vertical | draws the axis for the Y variable vertically. If this option is turned off, the Y axis is horizontal. |
| Orientation: Vertical Axis at Left | places the vertical axis at the left side of the plot. If this option is turned off, the vertical axis appears at the right side of the plot. |
| Orientation: Horizontal Axis at Bottom | places the horizontal axis at the bottom of the plot. If this option is turned off, the horizontal axis appears at the top of the plot. |

You can modify other aspects of a contour plot by using the pop-up menu.

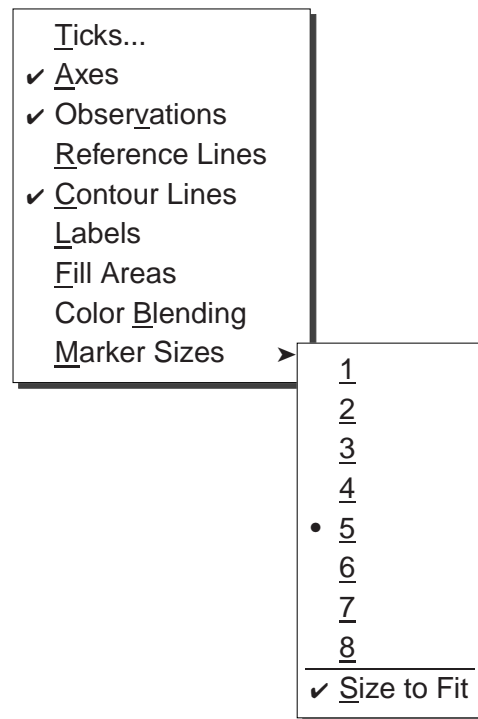


Figure 36.5. Contour Plot Pop-up Menu

| | |
|------------------------|---|
| Ticks... | specifies tick labels on either axis. |
| Axes | toggles the display of axes. |
| Observations | toggles the display of observations. When this menu is toggled off, observations are displayed only if selected. |
| Reference Lines | toggles the display of lines that indicate the position of major ticks on the axes. This option is not available unless the axes are visible. |
| Contour Lines | toggles the display of contours (level curves). |
| Labels | toggles the display of contour level labels. |
| Fill Areas | toggles the display of filled contour areas. When this menu item is toggled on, an area between two adjacent contour levels is filled in with the color of the lower level. |
| Color Blending | applies color blending to all contour levels. The color blend in the tools window is used. |
| Marker Sizes | sets the size of markers used to display observations. |

You can select and brush observations in the contour plot even when they are not visible. If you click on a curve at the location of an observation, you select that observation. If you click on a contour curve between two observations, you select the curve.

Part 3. Introduction

You can use the hand tool to add contour curves at new locations. To add a new level curve, click at some (x, y) position; the level curve that passes through that location is computed and displayed. To move a contour level, drag on the level curve, then release the mouse at a new location (x', y') . Mathematically, this process results in seeing the level set that passes through (x', y') .

Finally, you can set colors, patterns, and widths of contour lines the same way you set these attributes for curves. See Chapter 13, “Fitting Curves,” for examples of setting patterns, widths, and colors. See also Chapter 11, “Coloring Observations,” for instructions on color blending.

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