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Workshop Tutorial
KaleidaGraph

This tutorial is intended for use by students wishing to visually analyze data sets.

Workshop Description:
This tutorial will inform the user how to create and format graphs using KaleidaGraph. This program is useful for creating clear, legible figures to include in research papers and other professional documents.

Suggested Reading and Related Links:

http://lime.weeg.uiowa.edu/~c004135/kaleidahandout.html

http://www.google.com/search?hl=en&q=kaleidagraph+tutorial&btnG=Google+Search

KaleidaGraph Workshop –

(from KaleidaGraph manual®- more about KaleidaGraph can be found in the manual)

A guide through the operation of KaleidaGraph. The workshop will walk you thought the following:
• Create a new data set, change the column titles and format, sort the data, and calculate simple statistics
for the data.
• Create a Scatter plot, change the display of the variable, use a few plot tools, and add a curve fit and error
bars.
• Create a Column plot from a saved data set, modify the axes, change the display of the axis labels, and
add value labels above the columns.
• Display the plots from the preceding examples on the same page using the layout window.
Some optional examples are also included to show you how to perform common operations not covered in the
main examples. The topics include editing the legend text and frame, using Formula Entry, applying a userdefined
curve fit, and modifying data in a saved plot.

Generating a Sample Data Set

This example takes you through the process of typing data into the data window, changing the column titles
and format, sorting the data, and calculating statistics on the raw data.

1.1.1 Entering Data
The first step is to type some data into the data window. To do this:
1. Type **4.3** into the first cell of column 0.
2. Press the **Enter** (Windows), **Return** (Macintosh), or **Down Arrow** key to move down to the next
cell.
3. Type the values **2.9**, **4.8**, **3.2**, **3.9**, **3.5**, and **2.3** into column 0. After each value is entered, press the
Enter, **Return**, or **Down Arrow** key to move down a row.
4. Click the cell at row 0, column 1.
5. Use the same method to type the data values **8.0**, **6.2**, **9.0**, **5.7**, **8.8**, **7.2**, and **4.9** into column 1.
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1.1.2 Changing Column Titles and Format
Next we will use the Column Format dialog to change the titles and format for these two columns.

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1. Double-click the column title of column 0 (or choose **Data** > **Column Format**).
2. Type **Time** into the field below the listing of column titles.
3. Click the name of the second column (**B**).
4. Type **Test 1** into the field below the listing of column titles.
This dialog can also be used to change the format of the data columns. The following steps change the display
of the data so that each value only has one decimal place.
1. Click **Time**, press **Shift**, and click **Test 1**. Both of these entries should be highlighted.
2. From the **Format** pop-up menu, choose **Fixed**.
3. From the **Decimals** pop-up menu, choose **1**.
4. Click **OK** to apply the changes to the data window.
Your data window should resemble the one shown in Figure 2-1.
Figure 2-1 Sample data window

1.1.3 Sorting the Data
Now we will sort the data to get the values in ascending order (from low to high).
1. If it is not already selected, click the **Time** label in the data window to select the entire column.
2. Choose **Functions** > **Ascending Sort**.
3. Press **Shift** and click both the **Time** and **Test 1** entries.
4. Click **OK** to apply the changes to the data window.
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1.1.4 Calculating Statistics
The final step is to calculate a number of standard statistics on one of the data columns.
1. Click the **Test 1** label in the data window to select the entire column.
2. Choose **Functions** > **Statistics** to display the statistics for the Test 1 data. The Statistics dialog provides a **Copy to Clipboard** button to export the results for use in a data, plot, or layout window
3. Click **OK**.
At this point, you can proceed to the next example or save your data by choosing **File** > **Save Data**.

1.2.2 Creating and Editing a Scatter Plot
This example uses the data from the preceding example to create a Scatter plot. This example shows how to

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change the marker type, size, and color, use the Identify and Data Selection tools, apply a Linear curve fit,
display the curve fit equation, and add error bars.

1.2.1 Creating a Scatter Plot
Now, let's create a plot using the example data entered in the previous exercise.
1. Choose **Gallery** > **Linear** > **Scatter**. The Variable Selection dialog is displayed. Notice that the
name of the data file and its column titles are displayed in this dialog.
2. Select **Time** as the X variable and **Test 1** as the Y variable by clicking the appropriate buttons.
Figure 2-2 shows what the Variable Selection dialog should look like at this point.
Figure 2-2 Variable Selection dialog
3. Click **New Plot** to create a Scatter plot.
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The X variable you selected is the independent variable and the Y variable is the dependent variable. By
default, the X variable is plotted on the horizontal axis and the Y variable is plotted on the vertical axis.
The title of the plot is taken from the name of the data window. The X and Y axis titles are taken from the
column titles of the variables being plotted. The Y variable title is also used in the legend.

1.2.2 Changing Plot Style
Now that the graph has been created, it can be modified very easily. For example, let's change how the data
is represented on the plot. You will use the Plot Style dialog to change the marker type, size, and color.
1. Triple-click the marker displayed in the legend (or choose **Plot** > **Plot Style**).
2. Select a different marker to represent the variable on the plot. The markers are displayed on the left
side of the dialog. The first six markers in the left column are transparent; all of the others are opaque
3. Change the value in the **Marker Size** field to 18 and select a different color from the color palette.
4. Click **OK** and the plot is redrawn to reflect the changes that have been made.

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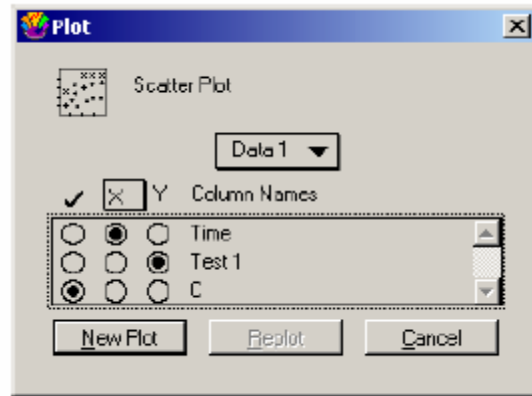
1.2.3 Using the Identify Tool

Now we will use the Identify tool (⊞) on the toolbox to display the coordinates of the data.
1. Select the Identify tool by either clicking it or pressing **I** on your keyboard.
2. Once the tool is selected, click one of the data points. The X and Y coordinates are displayed in the
upper-left corner of the plot window.
It is also possible to leave the coordinates directly on the plot. To do this:
• Press **Alt** (Windows) or **Option** (Macintosh) as you release the mouse button. This places a label
containing the coordinates to the right of the point.

1.2.4 Applying a Linear Curve Fit

You can quickly and easily fit a curve to a set of data points. To add a curve fit to the plot:
1. Choose **Curve Fit** > **Linear**. This displays a dialog to select which variables to fit with the Least
Squares Error method.
2. Select a variable to be fit (in this case **Test 1**) by clicking its check box.
3. Click **OK**. The curve fit is calculated and the curve fit line is drawn on the plot. By default, the curve
fit results will also be displayed on the plot. If the equation is not displayed, turn on **Display Equation** in the **Plot** menu.
The position of the equation can be changed using the Selection Arrow.
1. Click the Selection Arrow on the toolbox.
2. Drag the equation to a new position.
3. When the move is complete, click anywhere else in the window and the object handles disappear.
4. You can use the same technique to move the legend.
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At this point, your plot should resemble Figure 2-3.
Figure 2-3 Sample Scatter plot

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Data 1

y = 1.0205 + 1.7131x R = 0.9255
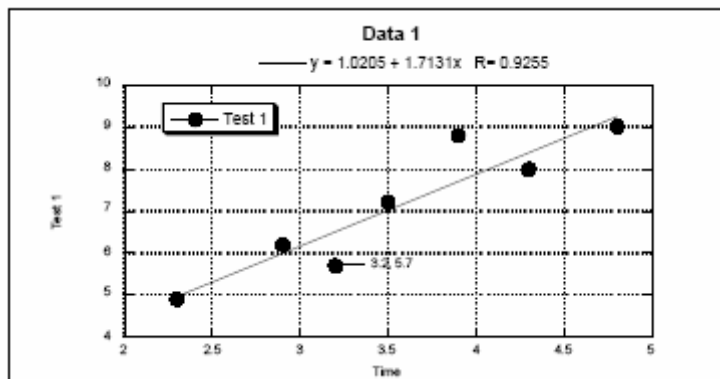
1.2.5 Exporting the Results of the Curve Fit

Once a curve fit is applied, you can copy the values of the curve fit line to the data window. These values are
appended after the existing data in your data window. The first column will be a series of X values. The
number of X values will be equal to the number of curve fit points specified in the Curve Fit Options dialog
(**Format** menu). The second column will contain the values from the curve fit at each of these locations.

1. Reselect **Linear** from the **Curve Fit** menu. A Curve Fit Selections dialog appears with a drop-down
arrow under **View**.
2. Click the drop-down arrow and choose **Copy Curve Fit to Data Window** from the pop-up menu.
3. Click **OK** to return to the plot window.

1.2.6 Using the Data Selection Tool

Now we will use the Data Selection tool ( ) to graphically remove a point from the plot. The Data Selection
tool operates by enclosing a region of the plot in a polygon. Any data points outside the polygon are removed
from the plot. By pressing **Alt** (Windows) or **Option** (Macintosh) as you make the polygon, the data inside
the polygon can be eliminated.

1. Select the Data Selection tool by either clicking it or pressing **S** on your keyboard.
2. Once the tool is selected, press **Alt** (Windows) or **Option** (Macintosh) and create a polygon around
the data point in the lower-left corner of the plot window. Once the polygon is complete, the point is
removed and the curve fit is recalculated.
3. Double-click the Data Selection tool to return the plot to its original state.

1.2.7 Adding Error Bars

The last modification to the plot will be the addition of error bars. Error bars enable you to illustrate the amount
of error for the plotted data.
1. Choose **Plot** > **Error Bars** to display the Error Bar Variables dialog.
2. Click the check box in the **Y Err** column to add vertical error bars. The Error Bar Settings dialog is
displayed to choose the type of error.
3. From the pop-up menu, choose **Standard Error** for the error type. The dialog should look like the
one in Figure 2-4.
Figure 2-4 Error Bar Settings dialog
4. Click **OK** to return to the Error Bar Selection dialog.
5. Click **Plot** to add the error bars to the plot. The error bars represent the standard error of the entire
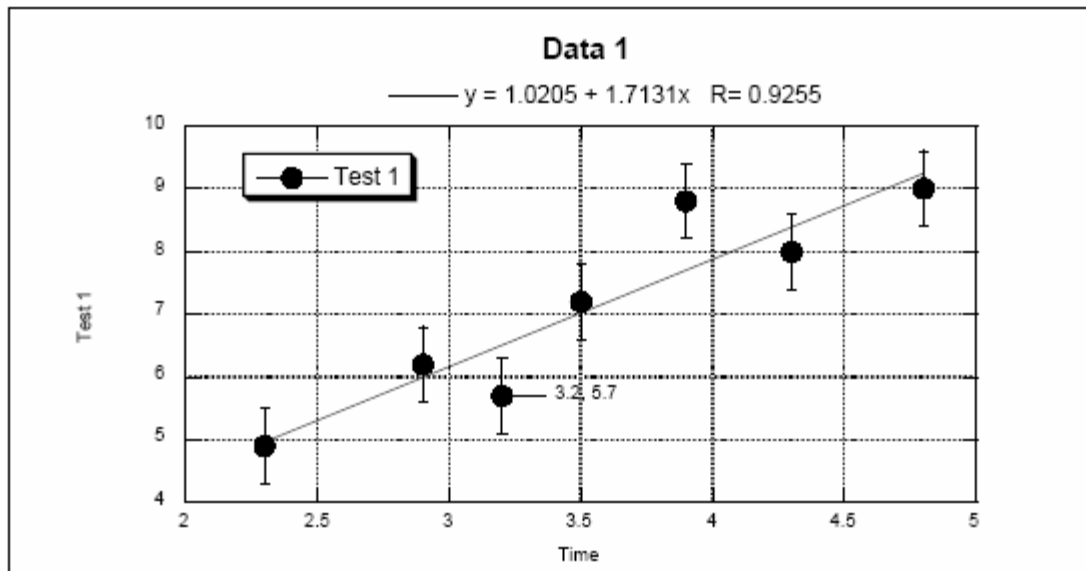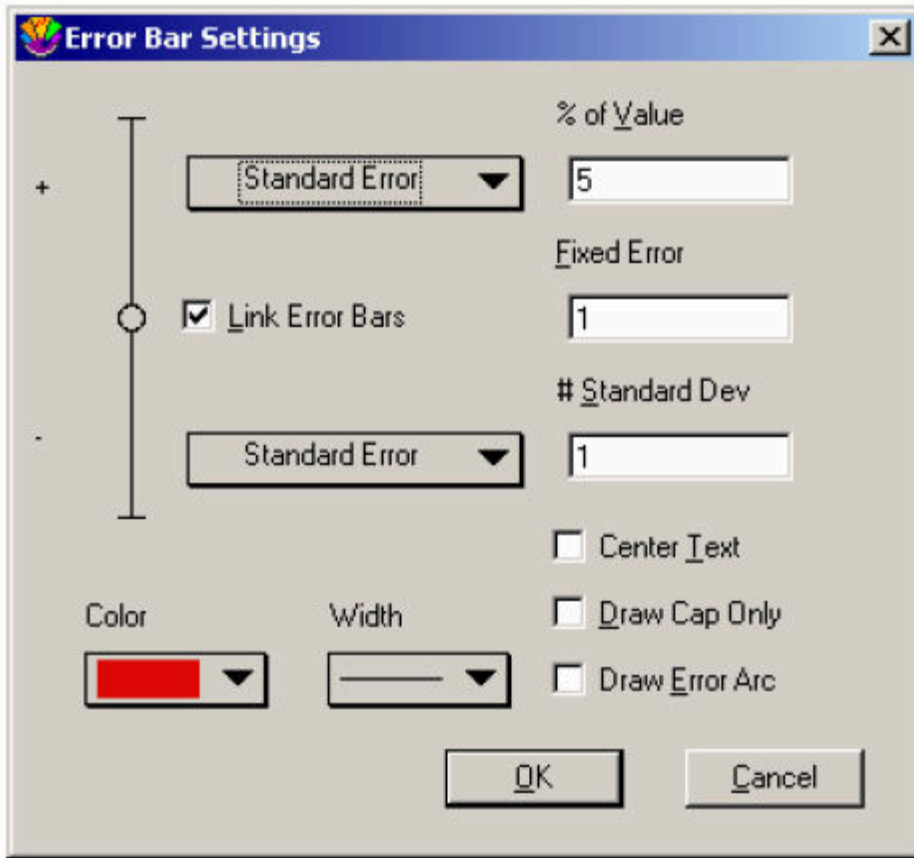data column.
The finished plot is shown in Figure 2-5.
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Figure 2-5 Finished Scatter plot
You have just created a customized plot. You can continue on to the next example or you can save the plot by
choosing **File** > **Save Graph**. If you save the graph, a copy of the data window is saved with the plot (in the
same file). The process of opening a saved plot and extracting the data is covered in Section 2.5.4.

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Error Bar Settings

% of Value

Standard Error ▾

5

Fixed Error

☑ Link Error Bars

1

Standard Dev

Standard Error ▾

1

☐ Center Text

Color   Width   ☐ Draw Cap Only

☐ Draw Error Arc

OK   Cancel

Data 1

——— y = 1.0205 + 1.7131x   R= 0.9255

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1.2.3 Creating and Editing a Column Plot

This example uses a Column plot to show how to adjust major and minor ticks, axis labels, fill patterns,
column spacing, plot color, and label rotation, in addition to displaying values above the columns.

1.3.1 Opening a Saved Data File

We will begin this example by opening a saved data set.
1. Choose **File** > **Open**.
2. Locate and open the **Data** folder, which is located in the **Examples** folder.
3. Double-click the **Housing Starts** file.

1.3.2 Creating a Column Plot

Now, let's create a plot using this data.
1. Choose **Gallery** > **Bar** > **Column**. The Variable Selection dialog is displayed.
2. Select **Month** as the X variable and **1966(K)** as the Y variable by clicking the appropriate buttons.
3. Click **New Plot** to create a Column plot.

1.3.3 Changing Axis Options

The first set of changes will be made in the Axis Options dialog. This dialog contains the majority of the
settings for the axes, grid lines, tick marks, and axis labels.
The first change is to remove the vertical grid lines.
1. Triple-click the X axis (or choose **Plot** > **Axis Options**) to display the dialog in Figure 2-6.
Figure 2-6 Axis Options dialog

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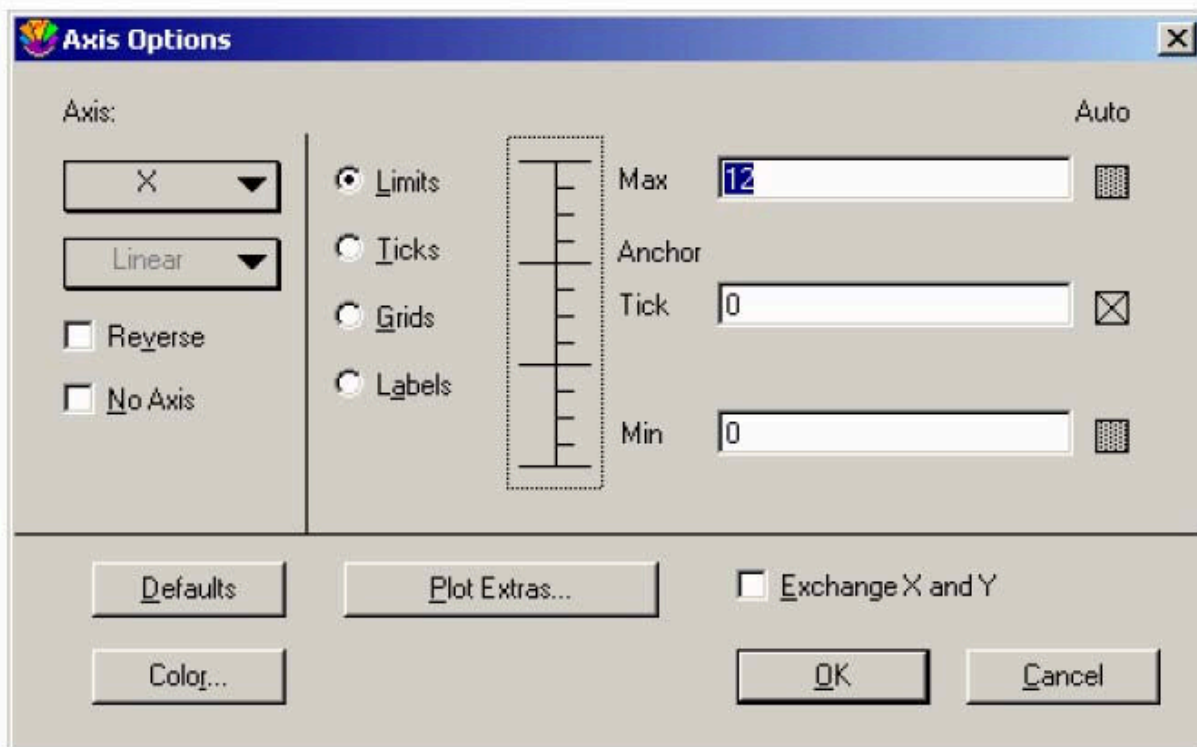
2. Click **Grids**. The dialog changes to show the options that can be selected for the major and minor
grids.
3. Choose **None** from the pop-up menu to the right of **Major**.
The next change is to remove the tick marks on the X axis.
1. Click **Ticks**. The dialog changes to show the options that can be selected for the major and minor
ticks.
2. Choose **None** from the pop-up menus below both **Major** and **Minor**.
The next change also involves the tick marks, but this time on the Y axis.
1. Select the **Y** axis from the pop-up menu under **Axis**.
2. Choose **Out** from the pop-up menus below both **Major** and **Minor**.
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The last step is to change the maximum Y axis limit from 140 to 160.
1. Click **Limits**. The dialog changes to show the options that can be selected for the limits.
2. Change the value in the **Max** field from 140 to 160.
3. Click **OK** to update the plot with all of the changes that were made while in the Axis Options
dialog

1.3.4 Changing the Fill Pattern
Now you can change the fill pattern for the columns using the Plot Style dialog.
1. Triple-click the small square in the legend which is filled with the same pattern as the columns (or
choose **Plot** > **Plot Style**).

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2. You can now select a different fill pattern for the columns. Click one of the fill patterns and a frame
appears around that pattern to show that it is selected.
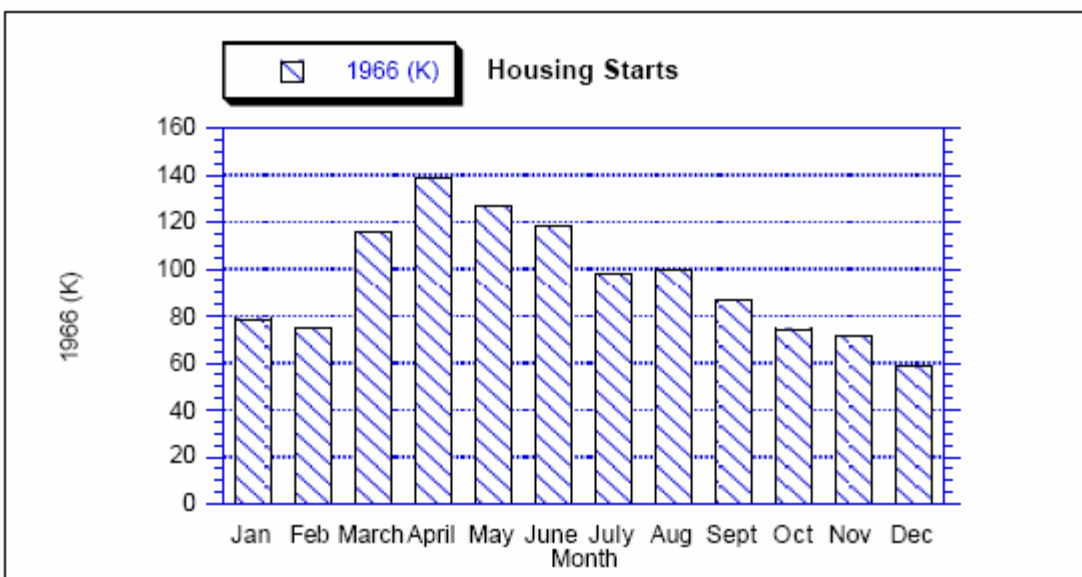3. Click **OK**.

1.3.5 Increasing the Column Offset
The next step is to increase the amount of space between the columns.
1. Choose **Format** > **Plot Extras**.
2. Change the **Column Offset** percentage from 20 to 40%.
3. Click **OK** to update the plot.
At this point, your plot should resemble the one shown in Figure 2-7.
Figure 2-7 Sample Column plot

1.3.6 Changing Plot Color
The next step is to add some color to the interior of the plot. By default, plots are created without interior and
background colors. To select an interior color:
1. Click any of the four axes to select the plot. Two sets of icons are displayed at the bottom of the
toolbox. The first icon displays two overlapping rectangles which control the interior and background color of the plot.
2. Click the rectangle in the foreground and select one of the lighter colors from the color palette that
appears. The selected color is used to fill the interior of the plot.

1.3.7 Editing Text Labels
The following steps remove the X axis title, resize the Y axis title, and rotate the X axis labels.

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1. Click the X axis title, **Month**, and press **Backspace** (Windows) or **Delete** (Macintosh).
2. Click the Y axis title, **1966 (K)**. Drag any one of the four object handles to increase the font size of
the label. It is also possible to change the font size by double-clicking the text label.
3. Double-click one of the X axis labels. Notice that this dialog has its own set of menus.
4. Choose **Format** > **90 Degree Rotation**.
5. Choose **Format** > **Right Justify** so that the rotated labels line up evenly.
6. Click **OK** to return to the plot window.
7. Drag one of the X axis labels closer to the axis. You can also use the arrow keys to move selected
objects one pixel at a time in the specified direction (10 pixels if you press **Shift** while using the arrow keys).

1.3.8 Adding Value Labels
The last step is to display the value of each column. To do this, turn on **Add Values** in the **Plot** menu. The
values are placed at the top of each column. The values can be moved as a group by dragging them to a new
location.
The Column plot is now complete.
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1.4 Laying out Plots for Printing
This example shows how to use the layout window to place the plots created in the previous examples on a
single page.
Note: The following steps assume the two plots from the previous examples are still available. If you saved
the plots and quit before reaching this example, use the **Open** command (**File** menu) to open these
plots. If you do not have them any longer, you can open any two plots from the **Plots** folder in the
Examples folder.

1.4.1 Placing Plots in the Layout
To place plots into the layout window:
1. Choose **Windows** > **Show Layout** > **KG Layout**. If no layout has been created previously, an empty
layout window is displayed.
2. Use the **Select Plot** command (**Layout** menu) to select the two plots that were created in the previous examples. At this point, do not worry about their overall placement.

1.4.2 Arranging Plots in the Layout
To arrange the plots in the layout window:

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1. Choose **Layout** > **Arrange Layout**. The Arrange Layout dialog allows you to enter the number of
rows and columns to divide the layout window into equal sections.
2. The default settings (two rows and one column) are sufficient for this example, so click **OK**. Notice
that the layout window is divided into two equal sections and the plots are automatically resized and
placed into these sections.

1.4.3 Modifying and Exporting the Layout

It is possible to display more than just plots in the layout window. The plot tools are available, enabling you
to add text and other objects to the layout. Various graphic images can be imported into the layout window.
Also, a background pattern and frame can be added to the layout using the **Set Background** command
(**Layout** menu).
The following steps explain how to add a text label to the layout window:

1. Select the Text tool (⟨T⟩) from the toolbox. You can select this tool by either clicking it or pressing
T on your keyboard.
2. Click anywhere in the layout window. The Edit String dialog will appear.
3. Enter some text into this dialog. KaleidaGraph supports fully-stylized text, so feel free to highlight
various portions of the text string you have entered and make changes to the font, font size, style, and
color. Any changes you make only affect the selected portion of the text string.
4. Once you are finished making changes, click **OK** to add the text label to the layout window. You can
move the label to a new position using either the Text tool or the Selection Arrow.
5. You can now print the layout by choosing **File** > **Print Layout**.
6. Close the layout window by choosing **File** > **Close**.
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34 2.5 Additional Examples

1.5.1 Editing the Legend

This example shows how to edit the legend frame and text. The attributes of the legend frame are controlled
by the bottom three icons on the toolbox. The steps in this example use the last icon in the toolbox, which is
divided into two sections: a Line Style icon on the left and a Line Width icon on the right.
1. Open the **Sample Plot** file, which is located in the **Plots** folder in the **Examples** folder.
2. Click the legend to select it.
3. From the toolbox, click the Line Width icon (the up and down arrows) and choose Hairline from the

pop-up menu. Notice that the legend frame changes from a shadow box to a hairline width line.
4. Now click the Line Style icon (the one to the left of the up and down arrows) and select one of the
dashed lines from the pop-up menu. Notice that the line surrounding the legend now contains the dashed pattern you selected.
5. Finally, choose **None** from the Line Style pop-up menu. This removes the legend frame completely
Now we can edit the text inside the legend.
1. Select the Text tool ( ) from the toolbox. You can select this tool by either clicking it or pressing
T on your keyboard.
2. Double-click any of the three labels inside the legend. A dialog is displayed to modify the text.
3. Delete the text in this dialog and type any information you like. Feel free to change the font, size,
and style as well.
4. Click **OK** to return to the plot and see the change.
The changes you made only affect this one label. If you use the Selection Arrow instead of the Text tool, you
can change the attributes of all legend items at once. However, you cannot edit the text with the Selection
Arrow.

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