



Excel 3

Charts, Graphs, and Macros

Office XP (2002) Version

CAL People and Computer Training
University of California, Berkeley

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Use this
space for notes

Introduction

Excel 3 is a course created for CAL PACT participants to learn more about the features of Microsoft Excel. The course covers selected intermediate material and applies to both the Windows and Macintosh computer platforms. This document serves as a future reference for you as you continue to gain experience on your own. Some topics may not be covered in as much detail during the course as they are in this document. Documentation is available for previous versions of Excel on the CAL PACT website: <http://calpact.berkeley.edu>.

Skills you need for this course

- How to use the mouse
- Familiarity with the Windows or Mac operating systems
- Understanding of the material covered in the Excel 1 and 2 courses
 - Specifically:* data entry
 - editing
 - formatting
 - formula creation and entry
 - printing

Skills and concepts you will learn in this course

- Making a chart using the Chart Wizard
- Editing a chart
- Formatting a chart
- How to record a macro
- Making a macro accessible

Conventions used in this document

Menus and menu commands are separated by a vertical bar (|). In the document they will appear as **Menu|Command**. An example of this is: “Select **File|New....**”

Making A Chart

Charts are an easy way to present comparisons, patterns, and trends in data you may have stored in Excel. Charts can be created as objects embedded in worksheets, or they can be stored on their own sheet. In Excel, Charts are linked to worksheet data from which it's created, and updated automatically when the worksheet data is changed.

Enter the Data

To create a chart, first enter the data for the chart on your worksheet. Don't forget to include labels for your data as well! As you enter your data, be mindful of the type of chart you want to create. Some data can only be presented in pie charts, while other data might be better presented as a bar or line chart. Once you've entered your data, Select the data to be charted (be sure to select the labels, too)


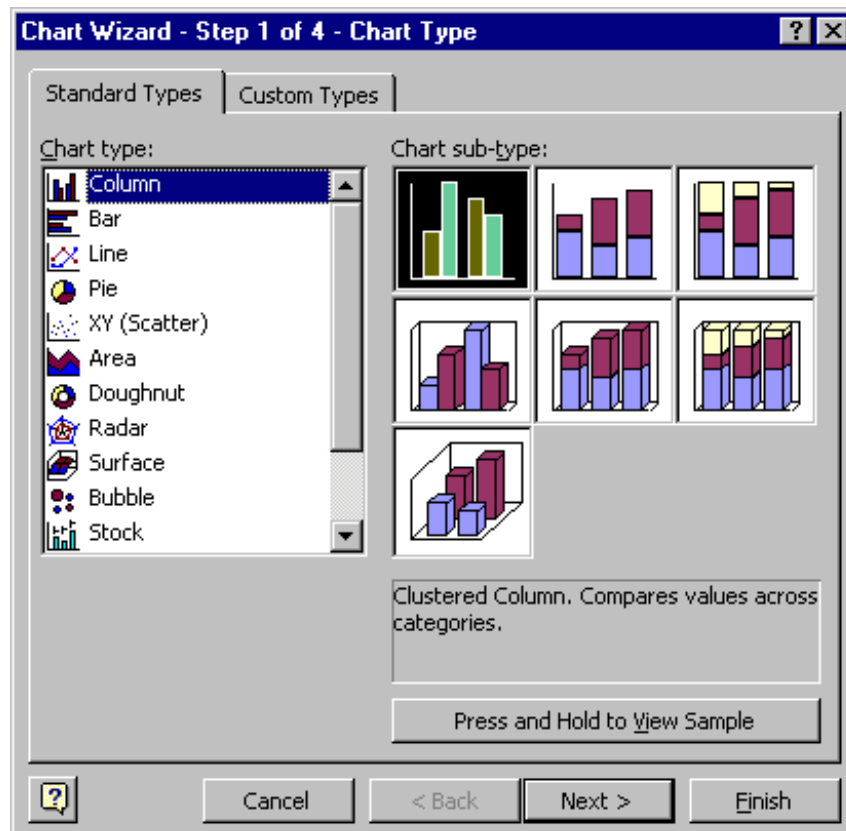
and begin creating your chart. Click the **Chart Wizard** button () to begin making the chart, or select **Insert|Chart**.

Chart Wizard- Step 1

Step 1 of the Chart Wizard asks what type of chart you want to use. Select a **Chart type** and a **Chart sub-type**. Chart sub-type is a variation on Chart type that plots the data in contrasting ways. A **preview** box below Chart sub-type describes the effect of the selected sub-type. Click and hold the **Press and Hold to View Sample** button to preview your selection. Click on **Next >** once you choose your desired chart.



Note



You can also use the **Custom Types** tab to select custom charts.

What's the difference between a Line chart and a (XY) Scatter chart?


Many users are unaware of the difference between a line and scatter chart. *Know the difference.*


The **line chart** emphasizes time flow and the rate of change, rather than the amount of change. The line chart will plot each data point one tick mark apart regardless of how far apart the x-axis data values are. An equal distance between one point to the next is shown.

The **xy- scatter chart** shows the relationship or degree of change between the numeric values in several chart data series. This means that Excel will calculate the scale and tick-mark labels for the x-axis, just as it does for the y-axis. A regression line can be plotted through a xy-scatter graph.

An Example: Looking at a plot of **account numbers vs. account balance**. The account number should not affect how the data is plotted since all account numbers represent the same type of information. Looking at a plot of time vs. growth, both time and growth are dependent and must be plotted according to scaled amounts.

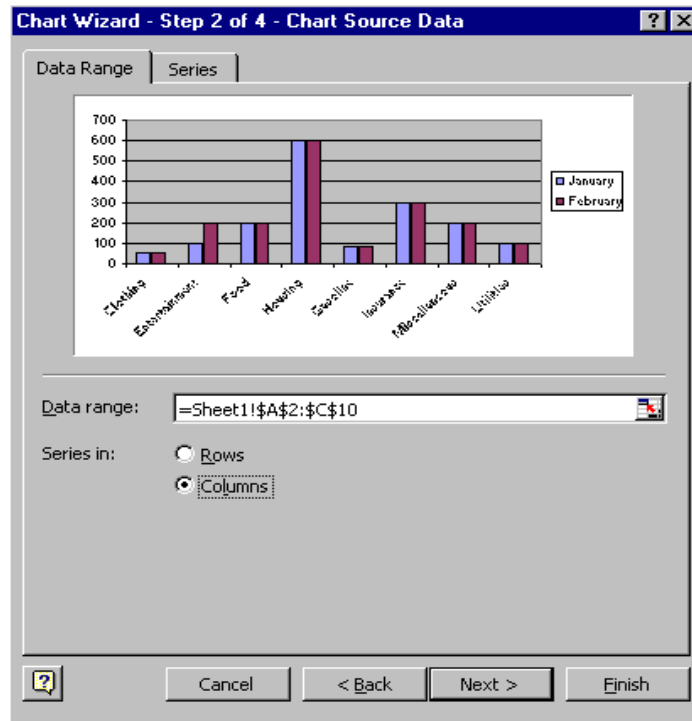
Chart Wizard- Step 2

Step 2 of the Chart Wizard asks to confirm the selected cells in the range display. If the wrong cells are selected, click the button to the right of the data range box () to collapse the **Chart Wizard** dialog box. Once the box is collapsed you can select the correct data. Click and drag the mouse cursor to select the correct range of cells. You can include the labels here or use the **Series** tab in the Chart Wizard.

Click the expand button () or hit Enter to select the cells and return to the Chart Wizard.

Sheet1!\$A\$2:\$C\$10					
1	Sample Budget				
2	Expenses	January	February	March	April
3	Clothing	50	50	50	
4	Entertainment	100	200	220	
5	Food	200	200	200	
6	Housing	600	600	600	
7	Gasoline	80	85	90	
8	Insurance	300	300	300	
9	Miscellaneous	200	200	200	
10	Utilities	100	100	100	
11	Total Expenses	1630	1735	1760	

Depending on whether you entered your data series in rows or columns, choose the appropriate radio button.



If you need to specify **Series Name** information, **Series Value** information, or **Category Labels**, click on the **Series** tab. If you did not select labels in the **Data Range** tab, you can specify them in the **Series** tab by using the collapse button as described previously.

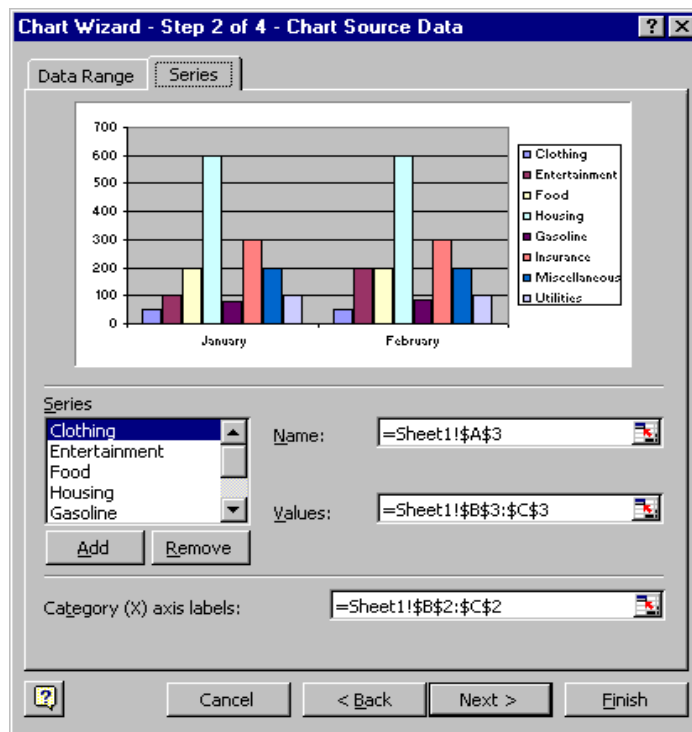


Chart Wizard - Step 3

Step 3 of the Chart Wizard selects options for the chart. Click through the tabs to edit **Titles**, **Axes**, **Gridlines**, **Legends**, **Data Labels**, and **Data Table**. Select the options preferred and click on **Next >**. Click **< Back** if there was a mistake or want to make changes in the previous steps. It is easy to modify most of these options once you create your chart. It might be a good idea to include or add everything that you might want; you can always modify or delete it later.

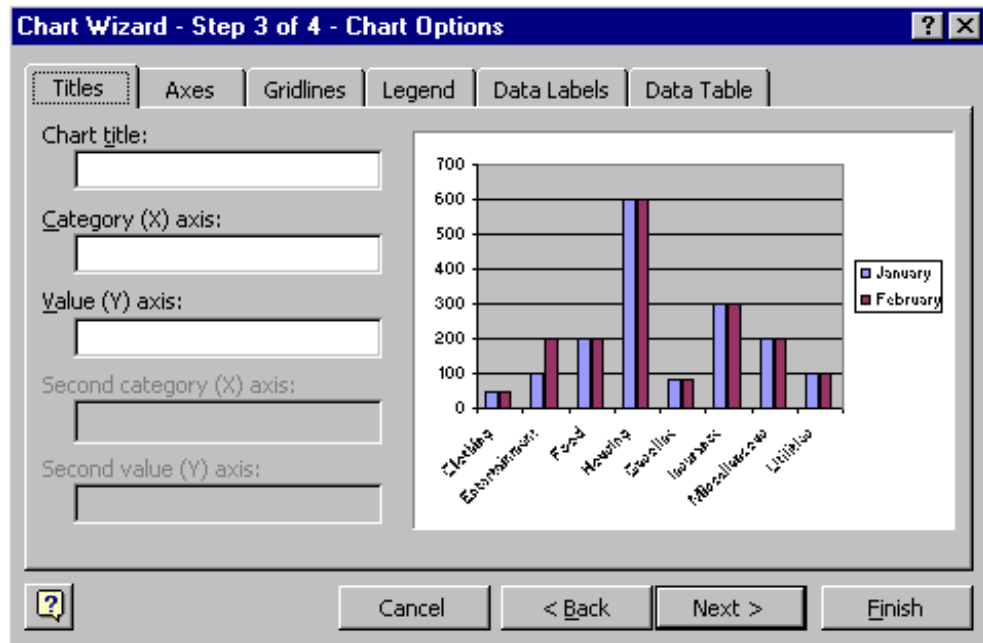


Chart Wizard - Step 4

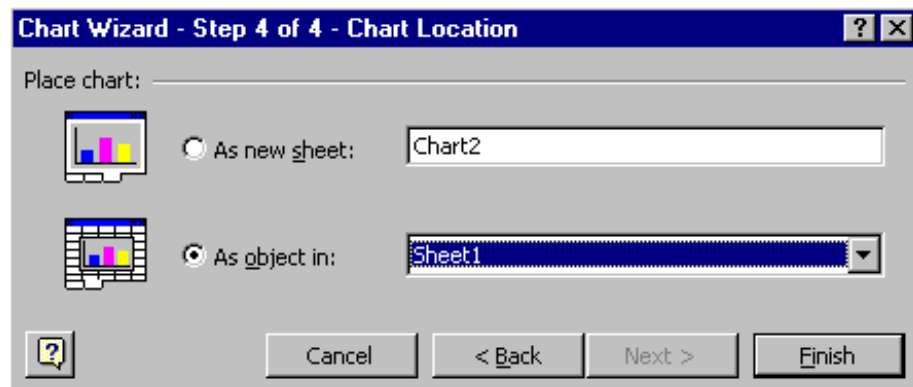
Step 4 of the Chart Wizard asks whether you want the chart to be placed on the current worksheet or on a new worksheet.

If you have lots of data and are only making a chart out of a few data points, make a chart on a new worksheet so that your worksheet does not become too cluttered. But if you want your data next to the chart, you might opt for the chart on the current worksheet.

Note



You can also place your chart on another sheet by selecting the desired sheet from the **As object in:** pull-down menu.

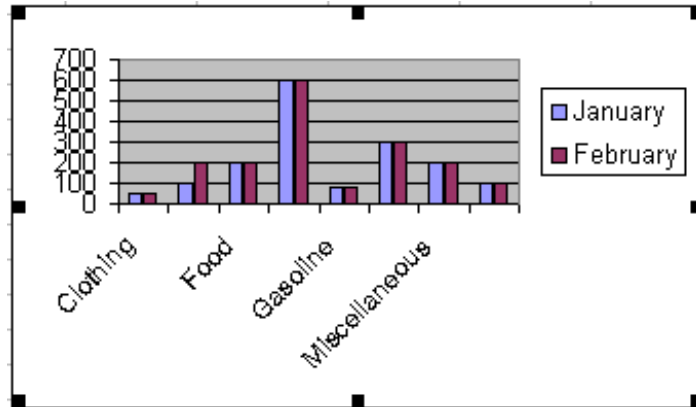


Working With A Chart

The following information only applies to charts that are created on the **same** sheet. Charts created on a new sheet will be selected by default.

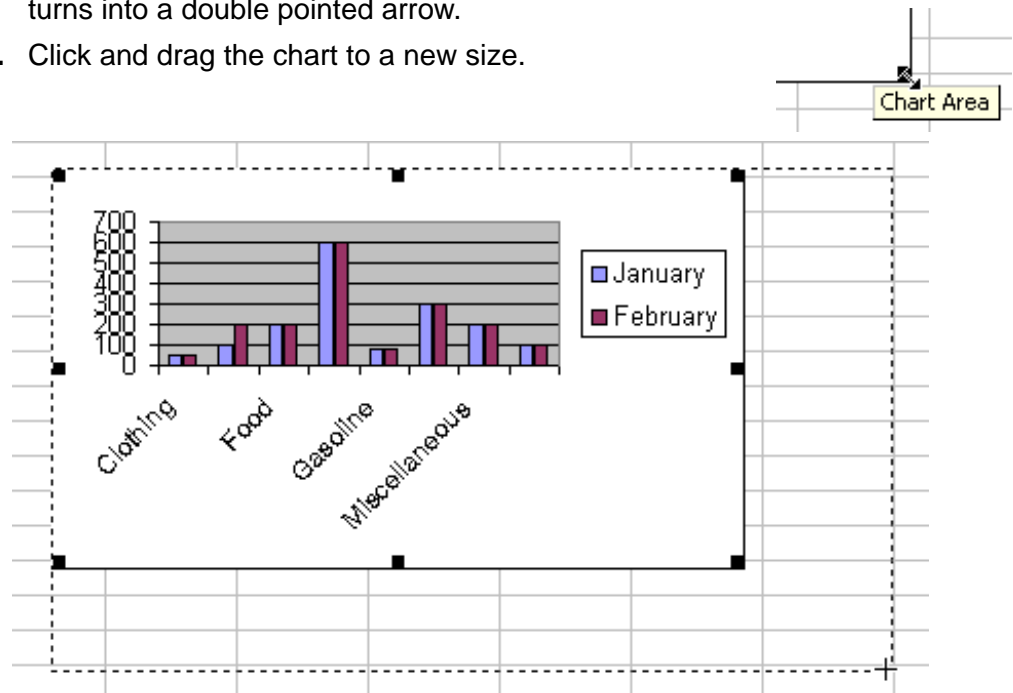
Selecting A Chart

Select a chart by clicking one time on the chart. The selected chart will have eight tiny boxes around the edge called handles.



Resizing the Chart

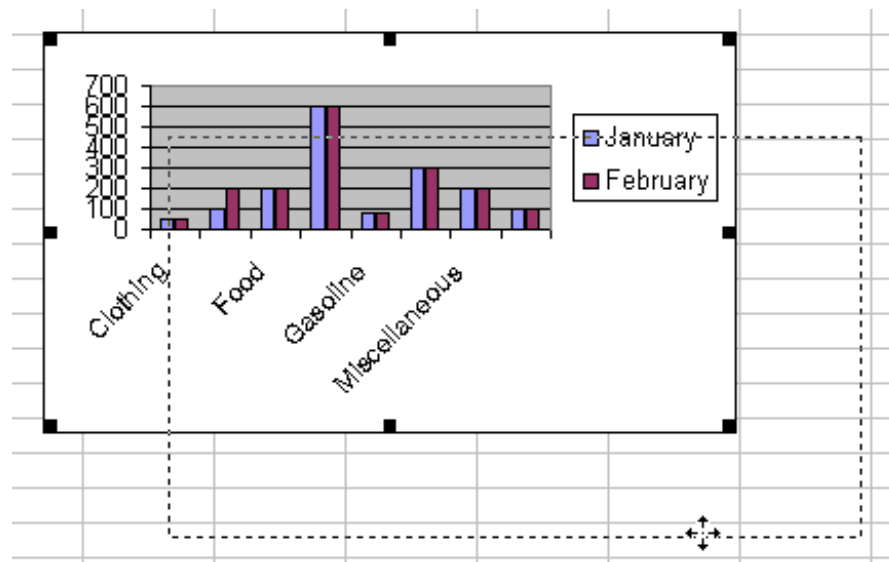
1. After you have selected the chart, the eight handles will appear around the border of the chart.
2. Select the appropriate handle depending on which direction the chart will be resized. For example, to make the chart wider to the right, select the handle in the middle on the right edge (and drag further to the right). To enlarge the chart area down *and* to the left, select the handle on the lower left corner.
3. When the mouse pointer is placed over a handle, it turns into a double pointed arrow.
4. Click and drag the chart to a new size.



Moving a Chart and its Contents

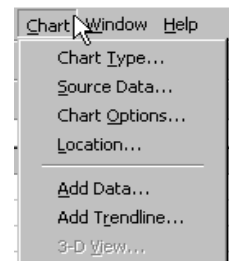
Moving a chart is similar to moving a cell. Select the chart to move and drag it to the new location. The Title, Legend, Axis Labels, and other chart objects can be moved from the opened chart.

1. Select the chart or object within the selected chart (such as the legend) to move.
2. The selected chart or object within the chart will show the eight handles around the border.
3. Move the object by dragging the object by its border (not the handles). You know you are in the correct place because your mouse pointer will become a four-headed arrow.



Editing a Chart

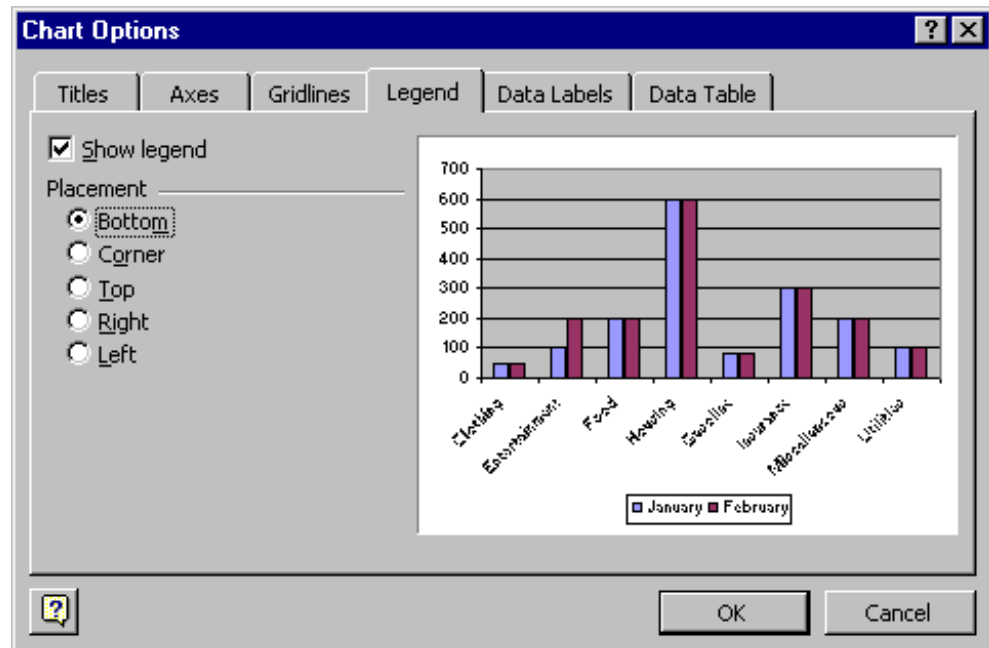
Once a chart has been completed you can edit it using the **Chart** menu from the menu bar. Select the chart and select the Chart menu. The first four menu options in the Chart menu (Chart Type, Source Data, Chart Options, and Location) are the four steps of the Chart Wizard! At anytime the chart is selected you can right click the chart to open up an option box on the PC, or on the Mac hold the control key and click. This quick menu contains the four steps of the Chart Wizard as well.



Legends

To insert a Legend

1. Select **Chart|Chart Options** from the pull-down menu or **Chart Options** from the quick menu.
2. Click the **Legend** tab and check the box next to **Show Legend**.
3. Select the placement of the legend box and click **OK**.



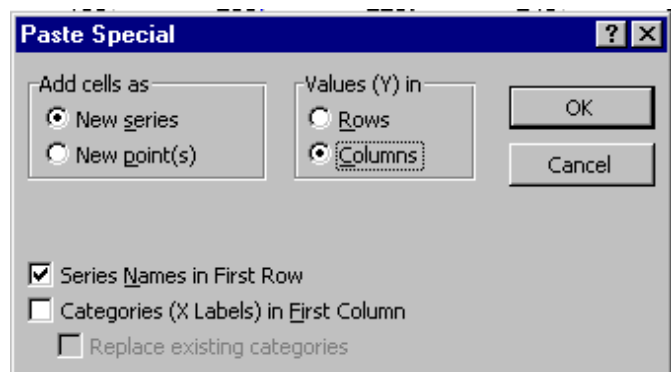
To resize the Legend

1. Select the legend from an open chart.
2. Click and drag the legend handles to resize.

New Series or Data

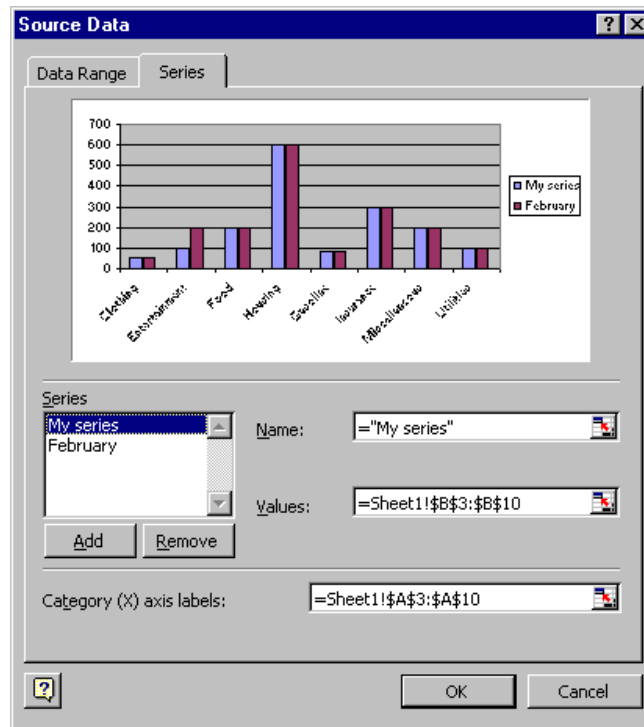
To add a new series or Data to a chart

1. Select and copy the data to add from the worksheet.
2. Select the chart to which you want to add the new data or series.
3. Select **Edit|Paste Special...**
4. Choose to add the cells as a **New Series** in **Rows** or **Columns**.
5. Check off whether the **Series Name in First Row** or **Categories (X Labels) in First Column** are included.



Naming a series (i.e. changing the series name in the legend)

1. Select the chart.
2. Select **Chart|Source Data**.
3. Choose the **Series** tab in the **Source Data** dialog window.
4. Under the **Series** box select the appropriate series and adjust the name in the **Name** field. To use a custom name, enclose the name in quotes. For example ="My series".



Deleting

To Delete a Legend, Chart Title, Axis Labels, or Series

1. Select the object to delete (remember selected objects will have handles around the border).
2. Press the delete key **or** select **Edit|Clear All** (to delete the selected region) **or** **Edit|Clear Series** (to delete the entire series).

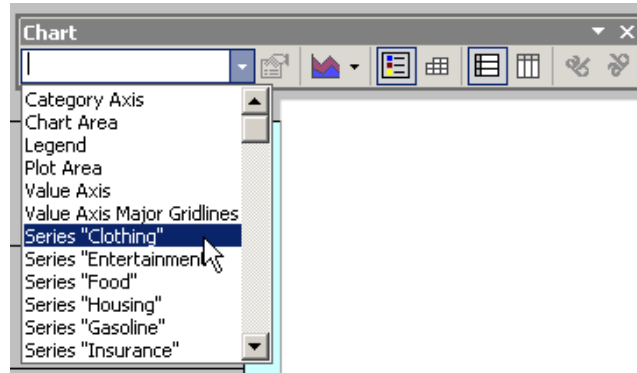
Formatting

The **Format** menu can customize the chart by changing the font of the chart text, the horizontal and vertical alignment, the text orientation, the pattern and color of the chart, and the style of the chart text. Remember that the chart must be selected *before* chart objects can be selected for formatting. Many times, by double clicking on the chart object, the appropriate formatting menu will be displayed. To use this shortcut, it is important (and sometimes difficult) to double click on the *correct* object. Don't get discouraged! If you're having trouble, you can always use the Chart toolbar to select exactly what you're looking for.

Note



All formatting options can be accessed by right clicking the object after it has been selected. A pop-up menu will appear and list the formatting options available.



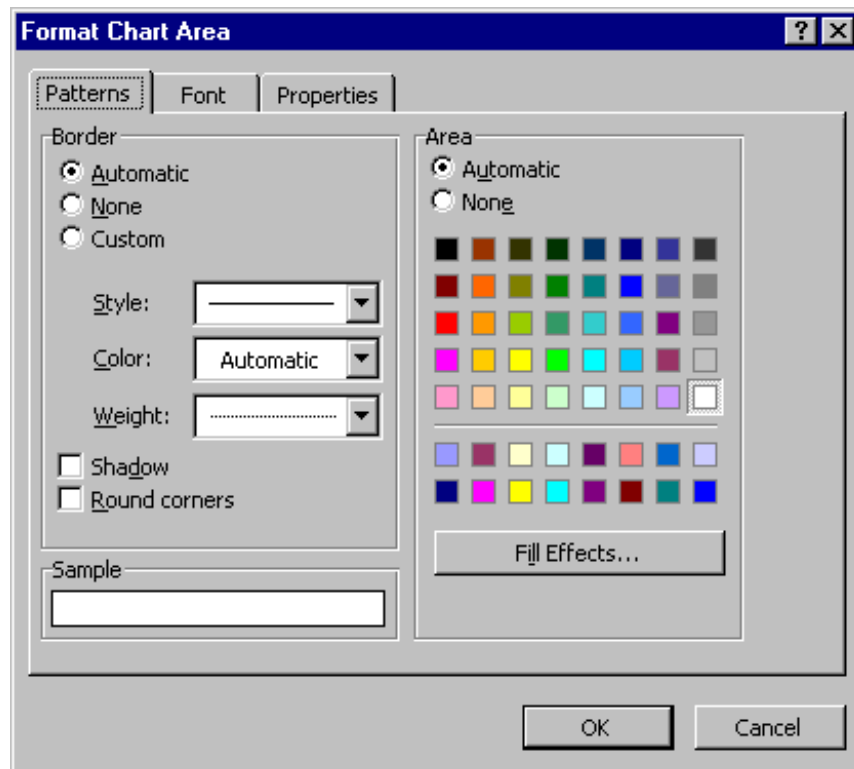
This is an example of the Chart toolbar, with a particular portion of the chart being selected. Once you select a portion of the chart here, you can then apply many different types of formatting.

Chart Type

The chart type can be changed by right clicking on the chart **or** by selecting **Chart|Chart Type**.

Chart Area

Change the background color of the chart or the text on the chart area by double clicking on the chart area. You can also change this by selecting **Format|Chart Area**. Below is the **Format Chart Area** dialog window that will be displayed.

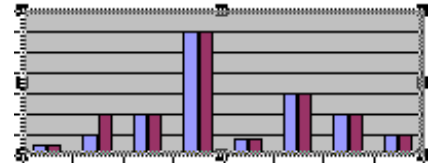


Plot Area

The default plot border and area for Excel 2000 is gray. Change this by double clicking on the plot area and then changing the color of the area and border to the desired color.

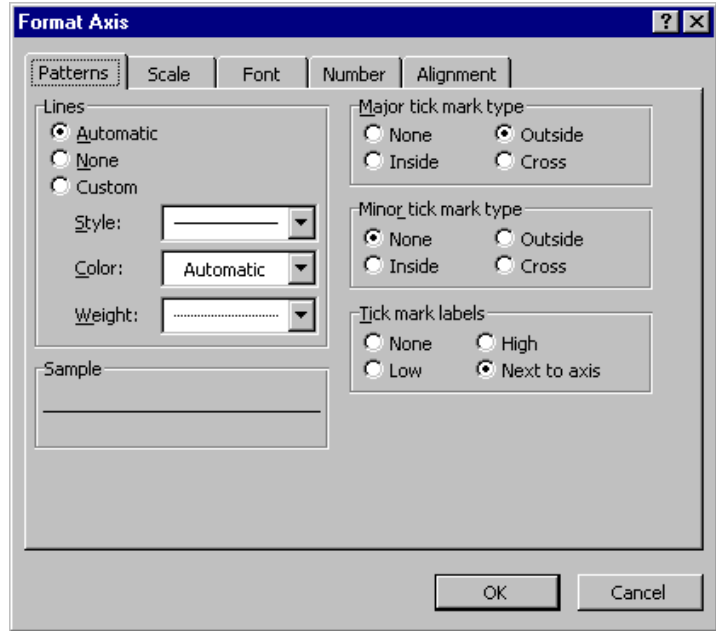
Data Series

Select and double click the data series to rename the series, change the pattern (color and markers) of the series, and add error bars or data labels to the series.



Axis

Double click on an axis to change the pattern and scale of the plot, the tick marks of the axis, and the font, format, and orientation of the labels.

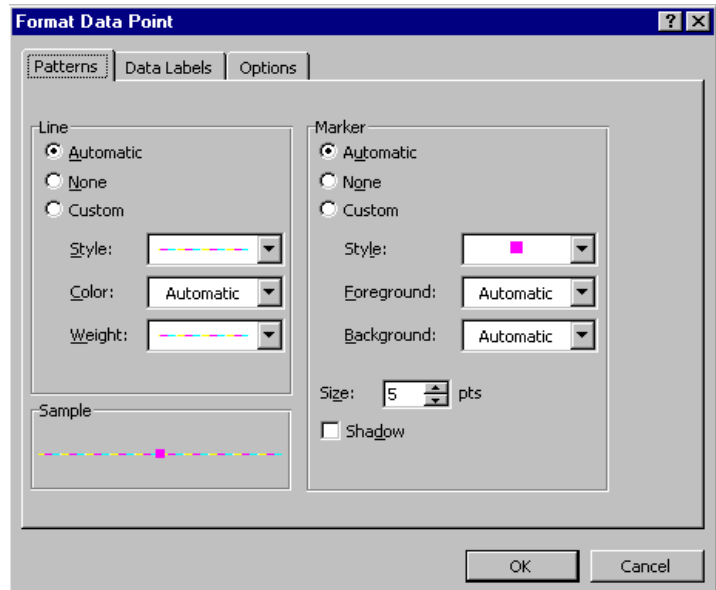


Legend

Change the pattern, font, an dplacement of the legend by double clicking on the legend.

Data Point

To select a certain data point, select the series that contains the data point and then double click on the data point to format it. Add labels of change the pattern of the selected data point.



Adding Text

To add text to a chart, select the chart and begin typing. The text you enter will appear in the formula entry bar. The text and it will appear on the chart as its own object.

Deleting a Chart

If the chart is on a new sheet

1. Click on the sheet tab at the bottom of the screen to select the sheet.
2. Delete the sheet by selecting **Edit|Delete Sheet**.

If the chart is on the same sheet

1. Select the chart by clicking once on the chart. The selected chart will have the customary eight handles around the border.
2. Clear the chart by selecting **Edit|Clear|All** or press the Delete key on the keyboard.

Automating Repeated Tasks

Macros are a series of commands that Excel automatically executes. Macros are best used when there is a series of tasks repeatedly performed using the same sequence of actions and commands. Macros in Excel are constructed using the Visual Basic programming language. However, it is not necessary to understand computer programming to begin creating macros. Excel includes a **Macro Recorder** which creates the Visual Basic code for you. This documentation will help get you started recording basic macros.

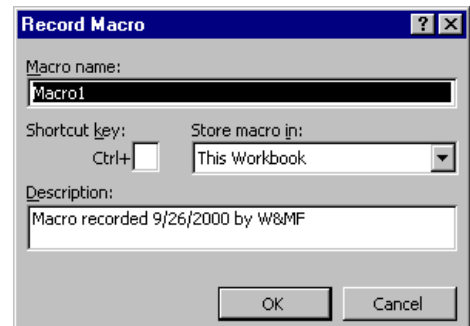
The Macro Recorder

The Macro Recorder is used to store any sequence of commands which are performed repeatedly. Once a macro has been recorded, you can run the macro to automatically repeat the commands that were recorded. The Macro Recorder works similar to a video camera. Just as a video camera records the sequence of a performance, the Macro Recorder records commands that are performed. Run the macro and the Macro Recorder plays back the commands, just as a video tape plays back the performance.

Steps to Recording a Macro

Before you start recording your macro, it's important to break down the steps of the macro, so you'll know each individual step which you'll need to record. (We'll provide a specific example following these instructions.) Once you have determined each individual step, you're ready to begin recording your macro.

1. Select **Tools|Macro|Record New Macro**. The **Record Macro** dialog window will appear.
2. Type in a name for the macro in the **Macro Name** field. The name must begin with a letter and can only contain letters, numbers, and underscores. The name *cannot* contain spaces or punctuation marks.
3. Type in a description of the macro in the **Description** field if desired.



Note



Excel does not allow spaces in macro names.

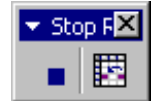
Note

If you create a keyboard shortcut that is the same as a default keyboard shortcut in Excel, *your* shortcut will overwrite the default shortcut in the program.

Reminder

Refer to the Excel Session 2 documentation for a review of absolute vs. relative cell referencing.

4. Create shortcut keys for the macro (and don't forget it!).
5. Use the **Store macro in** field to choose the location where the macro will be saved. Choosing **This Workbook** will save the macro in the current workbook. Choosing **New Workbook** will cause Excel to open a new workbook and save the macro inside. Choosing **Personal Macro Workbook** will cause Excel to save the macro in a special workbook that is always open and hidden.
6. Click the **OK** button to start recording the macro.
 - The dialog box will disappear and the **Stop Recording** toolbar will appear. The toolbar includes the **Stop Macro** button and the **Relative Referencing** button. In the Status bar, the word **Recording** will also appear to indicate that the Macro Recorder is running. If you accidentally close your Stop Recording toolbar *while you are recording your macro*, select **View|Toolbars|Stop Recording** and the toolbar will reappear.
 - Choose whether or not the macros will be relative or absolute. Relative referencing will make the macro run wherever the active cell is. Absolute referencing will run the macro across the exact same cells every time. To make your macro run with *relative* referencing, click on the **Relative Referencing** button.
7. Perform the actions to record using keystrokes or the mouse to select menus or toolbar buttons. **The Macro Recorder will record every action, mistakes included!**
8. Click the **Stop Macro** button on the toolbar to stop the Macro Recorder.

**Macro Example**

Following is an example of a macro that will set up a worksheet with the words "Sample Report" specially formatted and centered across several cells.


Begin Recording the Sample Macro

1. Select **Tools|Macro|Record New Macro**.
2. In the **Macro Name** field type "SampleTitle." Remember that the name must be one continuous word because Excel does not allow spaces.
3. In the Description field, type what this macro will do.
4. Click the **OK** button.
5. The macro is now recording. From here on, **all** the actions performed are recorded until the macro is stopped. (Remember to click the **Stop Macro** button when you are finished!)

Note

In this example, you will always want the title "Sample Report" in cell A1 whenever you run the macro. This is *absolute referencing* so you do not need to select the **Relative Referencing** button in the toolbar.

Enter the title and apply custom formats

1. Select cell A1, type "Sample Report" and then press Ctrl-Enter.
2. Make sure cell A1 is selected and change the font to "Times New Roman."
3. Change the font size to 16.
4. Boldface and underline the title.
5. Highlight cells A1 through I1 and click on  to "Merge and Center."
6. Click the **Stop Macro** button or go to **Tools|Macro|Stop Recording** if the toolbar disappears.

Running a Macro

After a macro has been recorded, you can run the macro at any time. Excel will repeat the commands inside the macro to perform the designated actions.

1. Select **Tools|Macro|Macros**.
2. In the **Macro Name** field, type or select the macro name to run.
3. Click the **Run** button.

Alternately, you can hit the keyboard shortcut you created and the macro will run.

Running the SampleTitle macro

1. Switch to a new worksheet in the workbook.
2. Select **Tools|Macro|Macros**.
3. In the **Macro/Reference** box, type or select "SampleTitle."
4. Click the **Run** button.

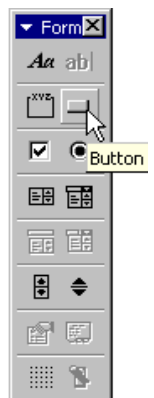
Making a Macro Easily Accessible

Once a macro is recorded, it can be made more accessible by attaching it to a graphical button. A button can be created in two places, either directly on a single worksheet or in a toolbar.

Assigning a Macro to a Button on a Sheet

If you choose to create a button for a macro on a sheet, the button will only appear on the worksheet on which it was created.

1. Select **View|Toolbars|Forms**. The **Forms** toolbar will appear on the worksheet (pictured here to the right).
2. Select the button icon and the cursor will become a crosshairs.
3. Click and drag out the desired size of the button and let go. The **Assign Macro** dialog window will appear.
4. Select from pre-existing macros or type the macro name in the **Macro Name** field and click **OK**.

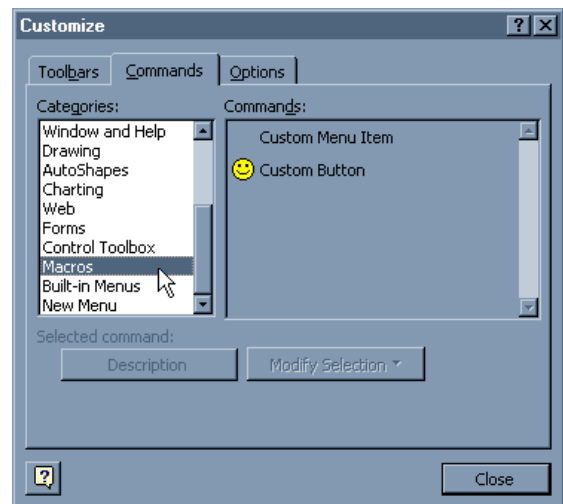


Removing the button or re-assigning the macro assignment

1. Right-click on the button (or press control+mouse click on Mac) to select the button and view the quick edit menu.
2. To remove the button, select **Cut**. You can also hit the Delete key if the button is selected (patched border appears around the button when selected).
3. To re-assign the button, select **Assign Macro** and select a new macro in the **Macro Name** field. Click **OK** after a new macro has been selected.

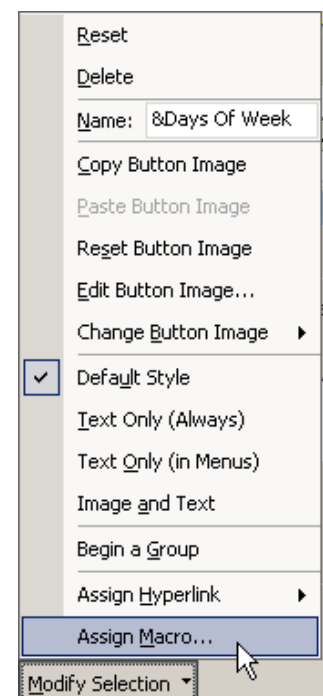
Assigning a Macro to a Button on the Toolbar

You may rather assign a macro to a button on a toolbar than an individual worksheet. This allows the macro to be accessible to every worksheet and workbook as long as the toolbar to which the button is assigned is displayed. If the workbook that stores the macro is not open at the time that the macro is selected, Excel will automatically open the workbook.



1. Choose **View|Toolbars|Customize**.
2. The **Customize** dialog window will appear. Select the **Commands** tab.
3. Select the **Macro** category from the left. Choose a button (**Custom Button** or **Custom Menu Item**), then click and drag the button to one of the toolbars. Release the mouse button when the toolbar button is in the desired location.
4. With the item still selected on your toolbar, select **Modify Selection** from the Customize window.
5. To assign the button to a pre-existing macro, select **Assign Macro**.
6. Choose your macro from the dialog box, then click **OK**, and then **Close** on the Customize dialog box will close.

From the **Modify Selection** button, you can also change the name (just type it in!), the button image, or create your own button image (**Edit Button Image...**). There are many options, just take some time to look through them and decide how you want to customize your macro! On a Mac, you can hold the control key and then click on the toolbar icon to access many of these similar features.



Removing a toolbar button or changing the macro assignment

1. Select **View|Toolbars|Customize**.
2. Once the **Customize** dialog box appears, right click on the toolbar button again and choose **Delete** to remove it. On a Mac, drag the button from the toolbar into the Customize dialog box.
3. To re-assign the button, right click the toolbar button while the **Customize** dialog window is displayed and select **Assign Macro**. Choose the appropriate macro and click **OK**.

The Personal Macro Workbook

The workbook that stores the macro must always be open for the macro to be used. This makes it difficult to manage many macros used in a variety of workbooks. A solution exists for this by saving all of the macros in the **Personal Macro Workbook**. This workbook is hidden from view, but is always opened whenever Excel is in use. Recorded macros can be saved into the Personal Macro Workbook by selecting this option in the **Record New Macro** dialog window that specifies the location to save the macro. When the first macro is saved, Excel creates a file called PERSONAL.XLS in the startup folder of the Excel directory. In order to view the Personal Macro Workbook to edit or add new macros using Visual Basic, choose **Window|Unhide** and select PERSONAL.XLS or the selection for Personal Macro Workbook.