

Using Microsoft Office 2007
Advanced Excel Handout
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Advanced Microsoft Excel 2007

Microsoft Excel 2007 is a software application that can be used as a spreadsheet, database, or graphing program. The electronic spreadsheet portion of Excel allows performing sophisticated calculations and creating formulas that automatically calculate answers. Data management capability allows manipulating lists of information such as names, addresses, inventory items, prices, etc. The information created in an Excel spreadsheet or database can be used to create Excel charts. In addition, Excel shares features such as the *Version Compatibility Checker* and the *Document Inspector* with other **Microsoft Office 2007** applications to ensure consistency in the preparation and presentation of information.

This handout presents some advanced features the program offers such as macros, paste special, organizational chart, advanced charting, and database. These are the features most commonly used by students and professionals in all fields.

Worksheet/Workbook Enhancements

Worksheet/workbook enhancements focus on the features Excel offers for internal use. When changing workbook properties, none of the data in the workbook is changed - only the description of the file. When cell comments are entered, they do not change the content of a cell; but only provide the description and explanation of the value in a particular cell.

VIEWING WORKBOOK PROPERTIES

Workbook properties are the information attached to a workbook to summarize its purpose or to help users locate it. Usually this information can be found in the *Properties* dialog box or the **Document Information Panel**, which contains fixed and modifiable information. Fixed information includes statistics such as the size of the workbook, the date the workbook was created, modified, date last accessed and the name of the last person who saved the workbook.

Workbook properties can be viewed and modified by opening the **Document Information Panel** (see Figure 1) beneath the **Ribbon** and, if necessary, the *Properties* dialog box (see Figure 2). Partial properties can also be displayed using the *Properties* view in the *Open* dialog box of a closed workbook (see Figure 3).

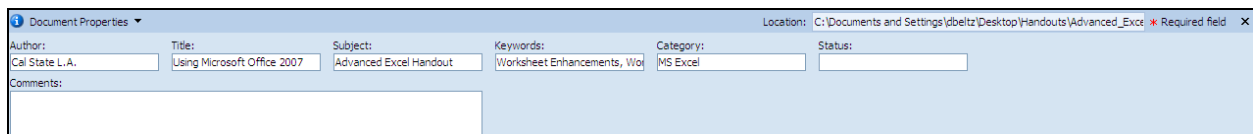


Figure 1 - Document Information Panel

To view the Document Information Panel:

1. Click the **Office Button**.
2. Select the **Prepare** option.
3. Select the **Properties** option.

To open the Properties dialog box:

1. With the **Document Information Panel** open, click the **Document Properties** drop-down arrow.
2. Click the **Advanced Properties...** option.

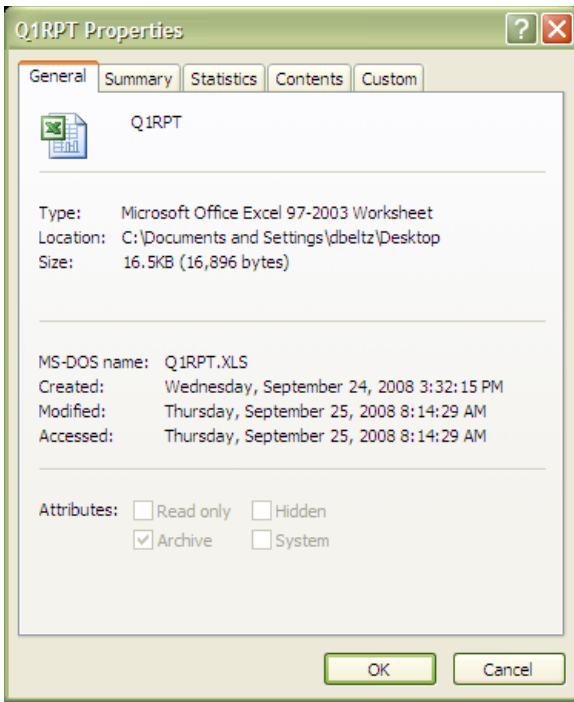


Figure 2 - Properties Dialog Box

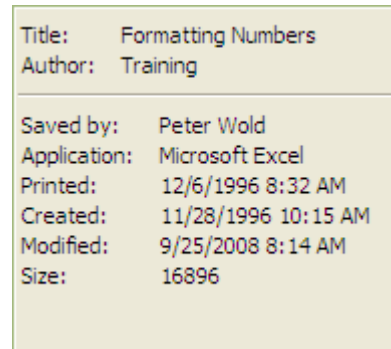


Figure 3 - Properties View in the Open Dialog Box

To view partial properties from the Open dialog box:

1. Click the **Office Button**.
2. Select the **Open** option. The *Open* dialog box will appear.
3. Click the **Views** drop-down arrow (see Figure 4).
4. Select **Properties** from the drop-down list.
5. If necessary, navigate to the drive and folder where the file is located.
6. Single-click the file to activate the partial properties panel (see Figure 3).

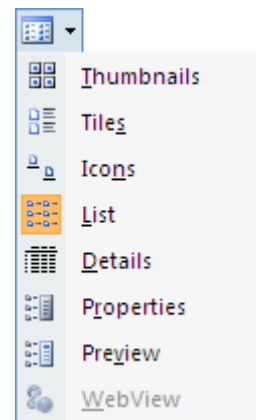


Figure 4 - Views Drop-down List

NOTE: If the computer is set to open files using a single click, step 6 above will open the file without displaying the partial list of properties. It is also possible to view a brief properties description (size, type, date modified) of the workbook by selecting **Details** from the **Views** drop-down list of the *Open* dialog box.

EDITING WORKBOOK PROPERTIES

The complete workbook properties can be found in the *Properties* dialog box (see Figure 2) in the *Summary* or *Custom* tabs. In the *Summary* tab there are preset fields where a user can insert new information or modify existing information. The user can also enter the title and subject text, enter or change the name of the author, assign categories or keywords or include comments. In addition to the existing fields, there are options in the *Custom* tab to create new fields and field information.

WORKING WITH COMMENTS

Comments are notes added to a worksheet. Comments can be used to provide information about data in a cell or about the worksheet itself. Examples of how comments can be used might include describing how the user arrived at a particular formula in a cell, or list the telephone number of a client to whom the data in the worksheet refers. When a comment is attached to a cell, a red indicator appears in the upper, right corner of the cell (see Figure 5). Comments are useful to communicate with other users when working in shared workbooks on a network. Since comments include the name of the current user, they can be an effective way to explain data or the reason for a change. For example, if some of the users change a value in a shared workbook, a comment helps in explaining why the value was changed.

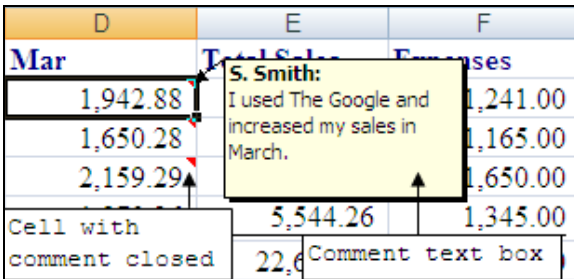


Figure 5 - Cells with Comments

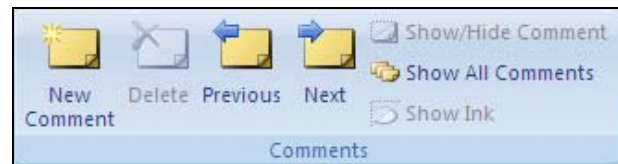


Figure 6 - Comments Group

To create comments:

1. Select the cell to add a comment to.
2. Select the *Review* tab on the **Ribbon**.
3. Click the **New Comment** button in the *Comments* group (see Figure 6). A text box will open with an arrow pointing to the cell where the comment will be placed.
4. Type the comment.
5. When finished, click outside the cell to hide the comment

NOTE: Comments can also be added by right-clicking in the cell and selecting the **Insert Comment** command.

Comments can be viewed using the same technique as viewing a *ScreenTip*. When the mouse pointer is positioned over any cell that has a comment attached to it, the comment appears in a comment box next to the cell. To hide the comment, move the mouse pointer away from the cell.

NOTE: To permanently display comments, right-click the cell and select the **Show/Hide Comment** option from the pop-up menu.

Comments automatically include the name of the current user. The user name can be changed by clicking the **Office Button** ► **Excel Options** ► **Popular** ► enter the correction in the **User name:** text box.

To change how comments are displayed, click the **Office Button** ► **Excel Options** ► **Advanced** ► make the changes in the **Display** section of the dialog box.

Comments can be edited by selecting the appropriate cell that needs editing. The **New Comment** button in the *Comments* group will change to an **Edit Comment** button. Clicking the **Edit Comment** button will open the comment text box in editing mode. Make any necessary changes and click outside the cell to save the edited comment.


Users can navigate through all comments in a worksheet by clicking the **Next** and **Previous** buttons in the *Comments* group until all comments have been viewed.

Comments can be deleted by selecting the cell with the comment and clicking the **Delete** button in the *Comments* group.

PRINTING COMMENTS

The comments can be printed on a separate page at the end of a printed worksheet or as they appear on the worksheet. Comments that print on a separate page at the end of the printed worksheet display the cell address, the author of the comment, and the text that appears in the comment.

To print the comments in a worksheet:

1. Select the *Page Layout* tab on the **Ribbon**.
2. Open the *Page Setup* dialog box by clicking the **Page Setup** dialog launcher .
3. Select the *Sheet* tab.
4. In the *Print* section, click the **Comments**: drop-down list box and select either the *At end of sheet* or the *As displayed on sheet* option.

NOTE: If the *As displayed on sheet* option is selected, the comment(s) must be set for permanent display. Otherwise, comments will not be printed.

5. Click the **Print...** button ► **OK** button.

USING SMARTART

SmartArt is a new feature in Excel 2007. *SmartArt* is a visual representation of information and ideas that combines text and graphics so that information can be shown in a more visually enhancing manner. Figure 7 is an example of *SmartArt*. When the *SmartArt* graphic is placed on a worksheet, text can be automatically entered. The advantage to using *SmartArt* is that the user does not have to draw any of the graphic shapes. They are automatically created when the graphic is selected. The *SmartArt* graphic can be formatted if a different appearance is desired.

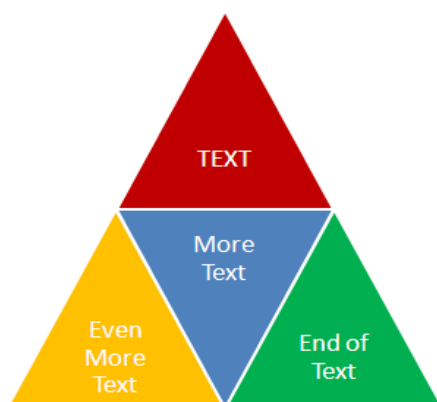


Figure 7 - Example of SmartArt

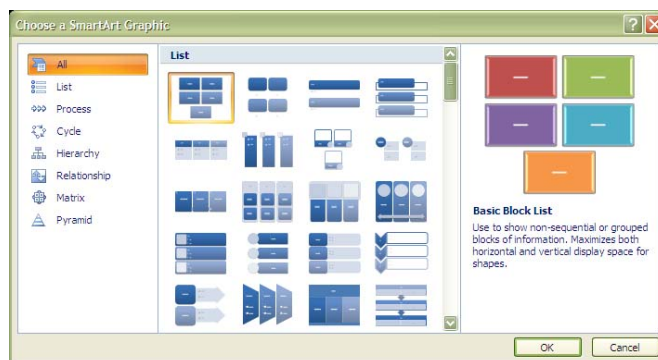




Figure 8 - Choose a SmartArt Graphic Dialog Box

To incorporate a *SmartArt* graphic onto a worksheet:

1. Select the *Insert* tab on the **Ribbon**.
2. Click the **SmartArt** button in the *Illustrations* group. The *Choose a SmartArt Graphic* dialog box opens (see Figure 8).

3. Select the category in the left column of the dialog box; select the graphic in the *List* section of the dialog box. A description is provided in the preview pane on the right side of the dialog box (see Figure 8).
4. After the graphic is selected, click the **OK** button. Text can then be entered by clicking in any part of the graphic where “[Text]” appears

NOTE: Text can also be entered by clicking the **Expand/Collapse** button  on the left edge of the graphic and opening the *Type your text here* dialog box (see Figure 10). Click the **Close** button  when finished and the text will automatically appear in the graphic.

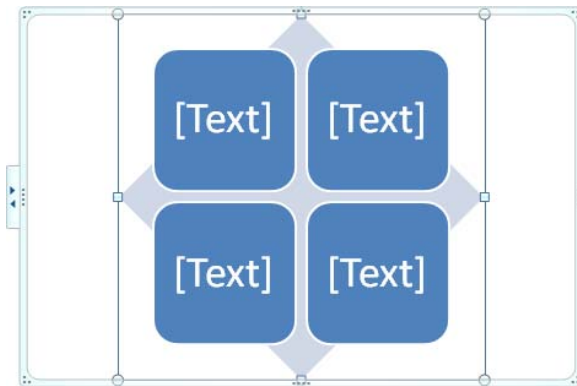


Figure 9 - Sample Blank SmartArt Graphic

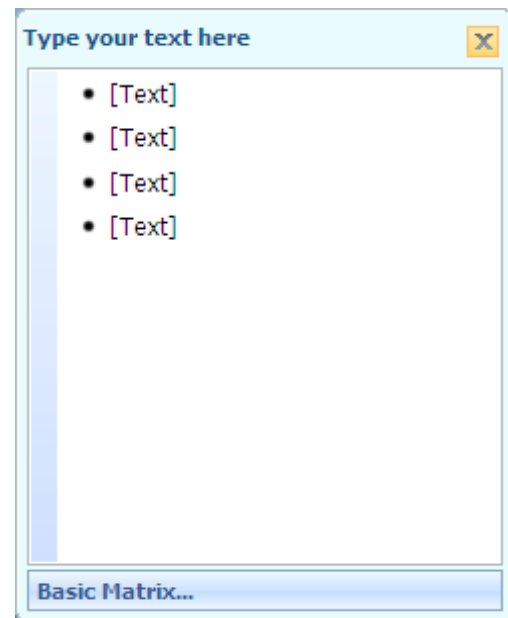


Figure 10 - Type Your Text Here Dialog Box

To format the graphic:

1. Select the object so that the sizing handles are visible as in Figure 9.
2. Right-click anywhere inside the object and select the **Format Shape...** option. The *Format Shape* dialog box opens (see Figure 11).
3. Choose the appropriate options until the desired formatting effects are displayed by the graphic.
4. When finished formatting the graphic, click the **Close** button.

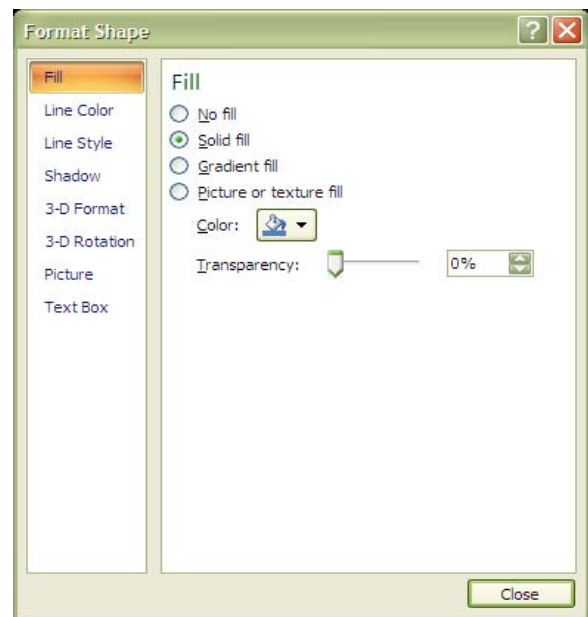


Figure 11 - Format Shape Dialog Box

Using Paste Special

There may be times when it is necessary to paste only certain aspects of copied data (such as formulas, values, or formats). For example, if the user wants to copy and paste all the formulas in a worksheet, but not the formatting associated with the cells. The **Paste Special** feature allows a user to specify which aspect of the copied data to paste; there are options to paste all cell attributes or only a specific one.

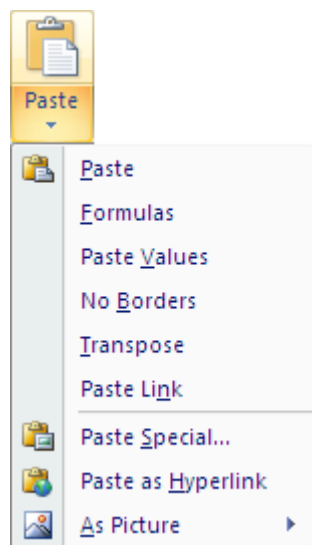


Figure 12 - Paste Drop-down Menu

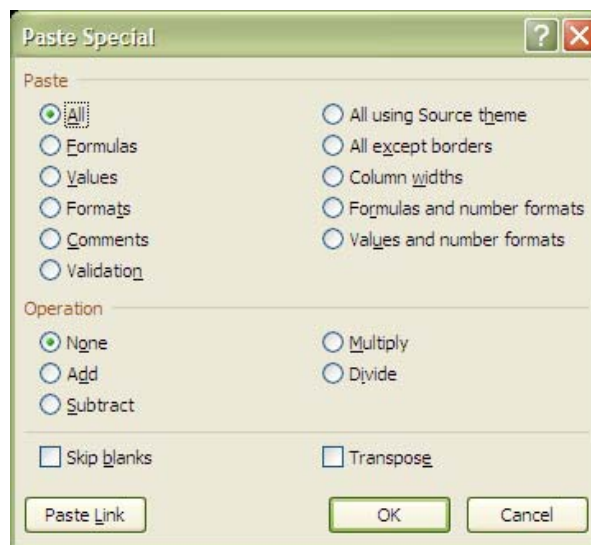


Figure 13 - Paste Special Dialog Box

WORKING WITH PASTE SPECIAL

When copying the contents of a cell or a range of cells, any formatting that has been applied to the cell(s) is copied, as well as the cell contents. When the user subsequently pastes the copied data, an exact copy of both the contents and its formatting is pasted.

To use the Paste Special option:

1. Copy the relevant cell(s).
2. Select the *Home* tab on the **Ribbon**.
3. Click the **Paste** drop-down arrow in the *Clipboard* group. The **Paste** drop-down menu opens (see Figure 12).
4. Select the **Paste Special...** option. The *Paste Special* dialog box opens (see Figure 13).
5. Select the appropriate option ► **OK** button.

NOTE: The *Paste Special* dialog box can also be opened by right-clicking in the cell where the pasting operation will be performed and selecting the **Paste Special...** option.

COPYING VALUES BETWEEN WORKSHEETS

There may be times when it is desired to copy the results of a formula, but not the formula itself. For example, a user may want to copy the totals from quarterly worksheets (in which each total is the result of a formula) to a summary worksheet (in which only formula results or totals are needed). Copying values between worksheets is accomplished by copying the cells, opening the *Paste Special* dialog box and selecting the **Values** option in the *Paste* section ► **OK** button.

COPYING FORMULAS BETWEEN WORKSHEETS

There may be times when it is desired to copy only the formula found in a cell or range of cells. Copying formulas between worksheets is accomplished by copying the cell(s), opening the *Paste Special* dialog box and selecting the **Formulas** option in the *Paste* section ► **OK** button.

Using Organization Charts

An organization chart displays the hierarchical relationships within a framework or organization. An organization chart consists of shapes and connecting lines. Each shape contains the name and represents the position of a unit. The lines or connectors between shapes represent the relationships between each unit in the chart. Generally, the shapes closer to the top of the chart represent a higher position in the hierarchy of the organization.

WORKING WITH ORGANIZATION CHARTS

The user can apply an organization chart slide layout to a new or existing slide. When inserting an organization chart, it appears in a drawing canvas. The drawing canvas can be resized and moved as desired.

PowerPoint treats an organization chart as a *SmartArt* object. Thus, adding animation effects, as well as formatting or selecting a different coloring scheme options are available to the user. Additionally, the layout of the chart can be changed as well. The different types of positions that can be included on an organization chart are described in Table 1.

To create an organization chart:

1. Select the *Insert* tab on the **Ribbon**.
2. Click the **SmartArt** button in the *Illustrations* group. The *Choose a SmartArt Graphic* dialog box opens (see Figure 8).
3. Click the **Hierarchy** button in the left pane. The available organizational charts will be displayed in the center pane. A description of each chart can be found in the right pane.
4. Select a chart ► **OK** button. A chart object will be inserted in the slide (see Figure 14).

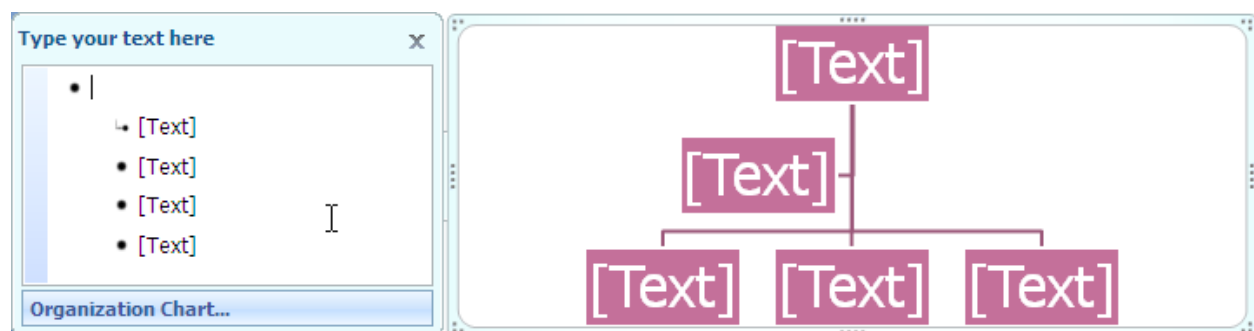


Figure 14 - Sample Organization Chart

NOTE: Text is entered and the chart formatted the same way as any other *SmartArt* object. See the *Using SmartArt* section in this document for instructions. Multiple objects can be selected by pressing the **[Shift] + [Ctrl]** key combination and clicking on the desired shapes.

To change the layout of the organization chart:

1. Right-click anywhere inside the object except in the text placeholders.
2. Select the **Change Layout...** option from the menu. The *Choose a SmartArt Graphic* dialog box will open (see Figure 8).

3. Click the **Hierarchy** button in the left pane. The available organizational charts will be displayed in the center pane. A description of each chart can be found in the right pane.
4. Select a chart ► **OK** button. The chart object will change to the desired layout.

To add a position to the organization chart:

1. Right click the text object relative to where the position will be added.
2. Select the **Add Shapes** option.
3. Select the location where the shape will be added (see Figure 15). A new position will be added to the chart.

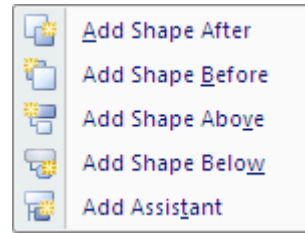


Figure 15 - Add Shape Options

Table 1 - Organization Chart Positions

Type	Position
Subordinate	Appears below and is connected to the selected shape.
Coworker	Appears adjacent to and is connected to the selected shape.
Assistant	Branches off from a connecting line, below the selected shape.

NOTE: A position can be deleted from the chart by selecting the position and pressing the **[Delete]** key.

To promote or demote a position in the chart:

1. If necessary, open the text box.
2. Right-click inside the text editor for the position.
3. Select the **Promote** or **Demote** option depending on the action desired. The position will be moved up (promoted) or down (demoted) relative to where it had been.

Drawing and Modifying Objects on Worksheets

The user can draw a variety of shapes on a worksheet. Additionally, once an object has been drawn, users can change the fill color, add text, or otherwise modify an object to give the presentation more visual appeal. For example, if a circle is drawn on a slide, it appears with the default fill color supplied by Excel. The user can modify the fill color to another color.

DRAWING AN OBJECT

The categories of objects that may be drawn include lines, rectangles, basic shapes, block arrows, equation shapes, flowcharts, stars and banners, callouts, and action buttons. Each category has several variations of shapes to choose from.

To draw an object on a slide:

1. Select the slide that will contain the object.
2. Select the *Insert* tab on the **Ribbon**.
3. Click the **Shapes** drop-down arrow in the *Illustrations* group (see Figure 16). The *Shapes* drop-down menu will open (see Figure 17).

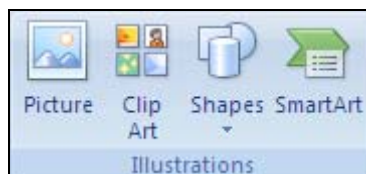


Figure 16 - Illustrations Group

4. Click on the shape that will be drawn.

- Place the cursor over the worksheet (the shape will change to a +).
Click and drag until the desired size of the shape is reached; release the mouse. The object will appear on the worksheet (see Figure 18 for an example of a drawn rectangle).

NOTE: Each object will have three different types of controls called handles (see Figure 18). The **Object Rotation Handle** rotates the object so that it is oriented at a different angle. The **Bi-Directional Sizing Handle** will simultaneously change the size of the object in two directions. The **Uni-Directional Sizing Handle** will change the size of the object in one direction. To use a handle, click and drag it with the mouse.

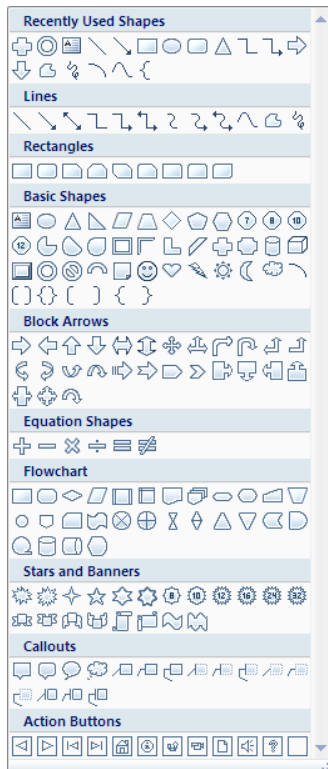


Figure 17 - Shapes Drop-down Menu

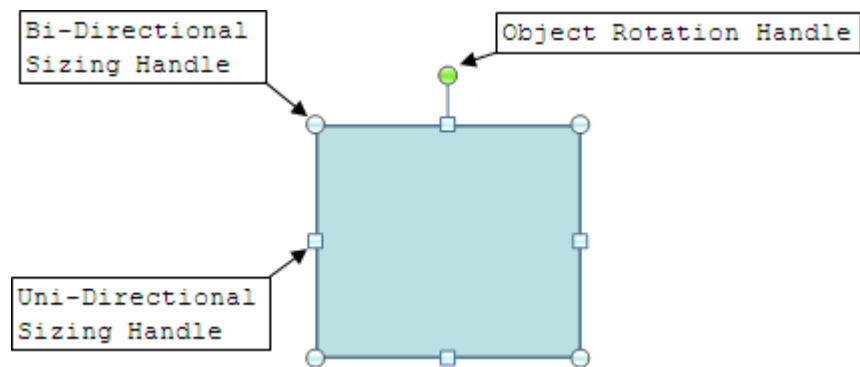


Figure 18 - Object Handles

CHANGING THE FILL COLOR

The user can change the color inside the object. Fill color can be either changed or removed completely.

To remove the fill color:

- Select the object to be modified.
- Select the *Home* tab on the **Ribbon**.
- Click the **Shape Fill** drop-down arrow. The **Shape Fill** drop-down menu opens (see Figure 19).
- Select the **No Fill** option. The object becomes transparent.

To change the fill color:

- Select the object to be modified.
- Select the *Format* tab on the *Drawing* contextual tab on the **Ribbon**.
- Click the **Shape Fill** drop-down arrow. The **Shape Fill** drop-down menu opens (see Figure 19).

4. Select the fill color from the **Theme Colors**, the **Standard Colors**, or the **Recent Colors** section.

NOTE: If more colors are desired, select the **More Fill Colors...** option and choose a color from the *Colors* dialog box (see Figure 20).

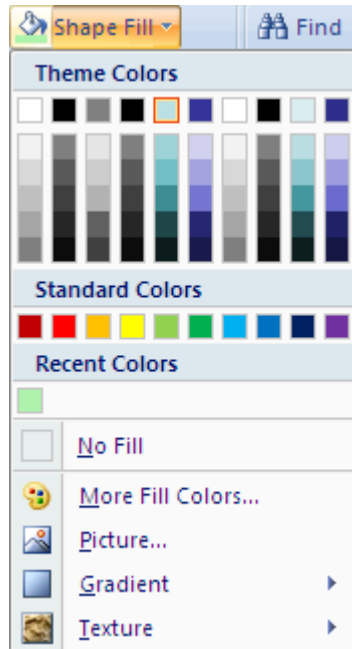


Figure 19 - Fill Color Drop-down Menu

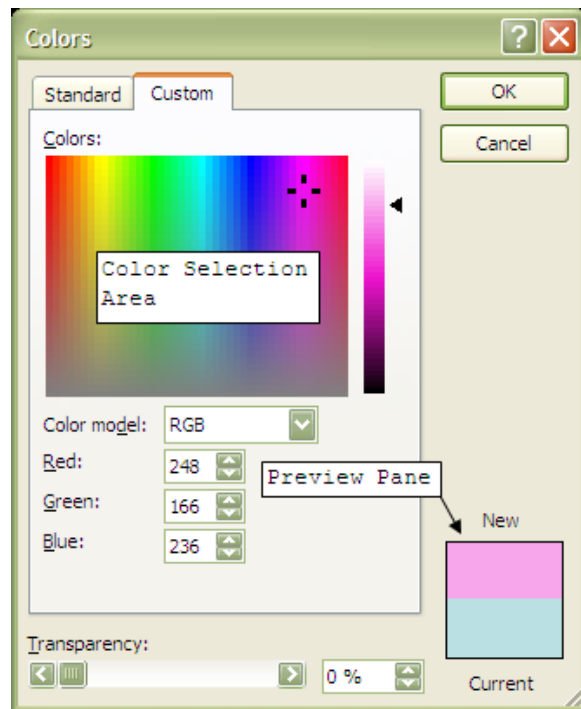


Figure 20 - Colors Dialog Box

CREATING AND MANIPULATING A TEXT BOX

Text boxes offer another way to present information. The user can create text boxes as desired to label objects or graphics, add captions, or create additional notes. The font, font size, alignment, and font style features can be used to format text box content in a variety of ways.

To create a text box:

1. Select the *Insert* tab on the **Ribbon**.
2. Click the **Text Box** button in the *Text* group (see Figure 21).

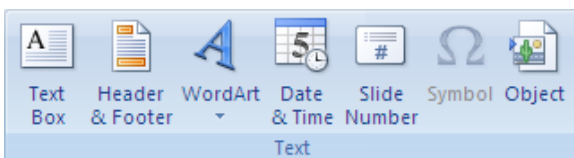


Figure 21 - Text Group

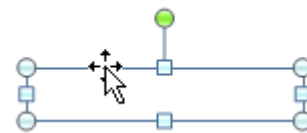


Figure 22 - Repositioning Cursor

3. Position the cursor in the document where the text box is to be created ► left-click and drag to draw the text box. As soon as the mouse is released, the cursor is placed inside the text box.
4. Type the desired text then click outside the text box.

To re-position the text box:

1. Click the text box to select it.

2. Move the cursor over one of the text box edges until it changes shape to a four-arrow cross (see Figure 22).
3. Click and drag the text box to its new location.

NOTE: A text box can be resized by first selecting it and then using the sizing handles as described in the Drawing an Object section of this document (see Figure 18 and Figure 22).

To edit the contents of a text box:

1. Right-click the text box to select it.
2. Select the **Edit Text** option. The cursor will be placed in the text box.
3. When the editing is complete, click outside the text box.

GROUPING OBJECTS

Grouping is particularly useful when multiple objects are intended to work together. When objects are grouped, they represent as a single object. Applying the same command to a group of objects saves time from changing each item separately. Additionally, grouped objects can be moved as a single object and maintain their spacing and alignment.

To group objects:

1. Hold down either **[Ctrl]** key or the **[Shift]** key and click each object to group.
2. When all objects have been selected, right-click on one of the objects.
3. Select the **Group** option to open the submenu (see Figure 23).
4. Select the **Group** command in the submenu (see Figure 23).

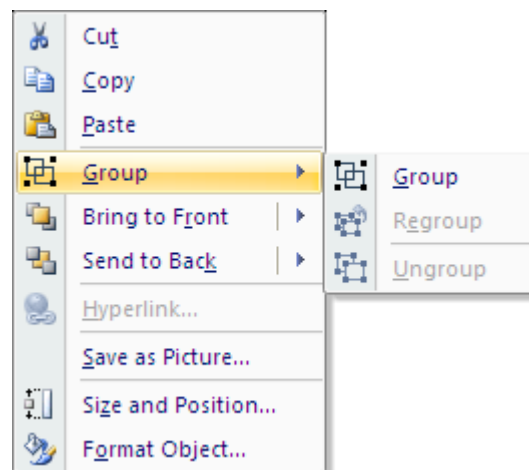


Figure 23 - Object Right-Click Menu

UNGROUPING OBJECTS

To make individual changes to an object that is grouped with other objects, it is necessary to first ungroup objects.

To ungroup objects:

1. Right-click any object in the group.
2. Select the **Group** option to open the submenu (see Figure 23).
3. Select the **Ungroup** command in the submenu (see Figure 23).

ADDING A 3-D EFFECT

An object can appear three-dimensional by adding a 3-D effect. For example, when creating a logo, a 3-D effect makes the object stand out from the page. There are a variety of different 3-D styles to select from.

NOTE: An object can have either a shadow or a 3-D effect, but not both. A line color cannot be assigned to fill a 3-D object, but the fill color can be changed

To add a 3-D effect to an object:

1. Select the object to add a 3-D effect to by clicking on it.
2. Select the *Format* tab on the *Drawing* contextual tab on the **Ribbon**.
3. Click the **Shape Effects** drop-down arrow in the *Shape Styles* group.
4. Select the **3-D Rotation** option in the *Shape Effects* drop-down menu.
5. Select one of the preset 3-D options (see Figure 24).

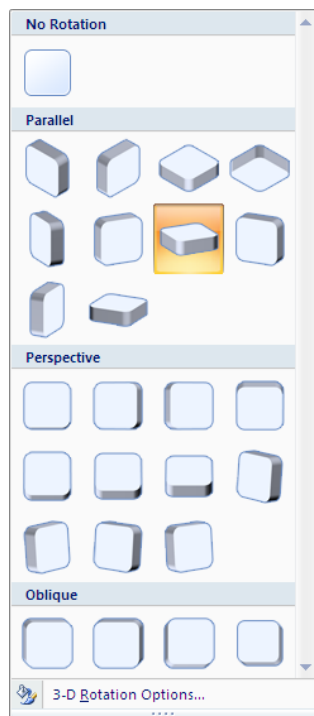


Figure 24 - Preset 3-D Rotations

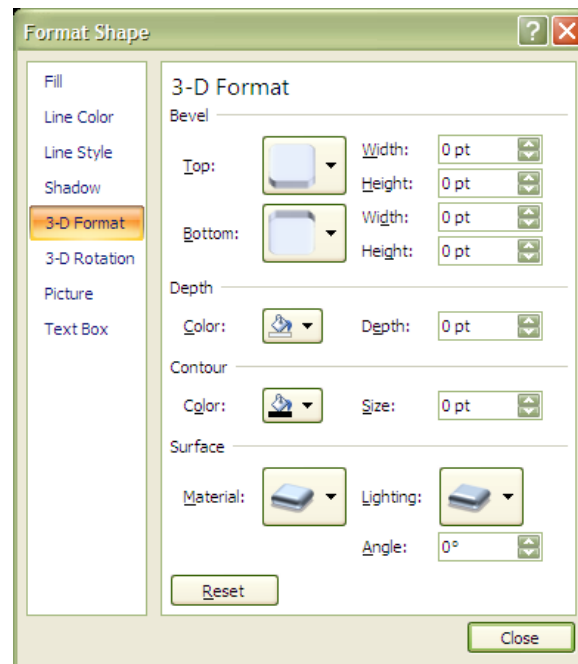


Figure 25 - Format Shape 3-D Format Dialog Box

NOTE: After selecting one of the preset options, the object will appear to have no depth. Depth can be added by selecting **3-D Rotation Options...** in the *Shape Effects* drop-down menu. When the *Format Shape* dialog box opens, click the **3-D Format** button and set the depth using the **Depth:** spin box (see Figure 25).

ADDING A SHADOW EFFECT

A shadow effect presents the object as if a light is being shined on it. The effect varies depending on the direction the light comes from. Excel 2007 offers the user a variety of shadow effects to choose from.

To add a shadow effect to an object:

1. Select the object to add the shadow effect by clicking on it.
2. Select the *Format* tab on the *Drawing* contextual tab on the **Ribbon**.
3. Click the **Shape Effects** drop-down arrow in the *Shape Styles* group.
4. Select the **Shadow** option in the *Shape Effects* drop-down menu.
5. Select one of the preset shadow effect options (see Figure 26).

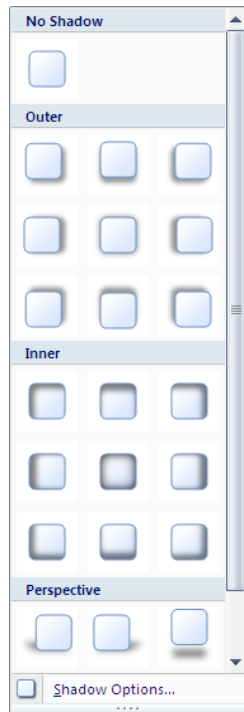


Figure 26 - Preset Shadow Effects

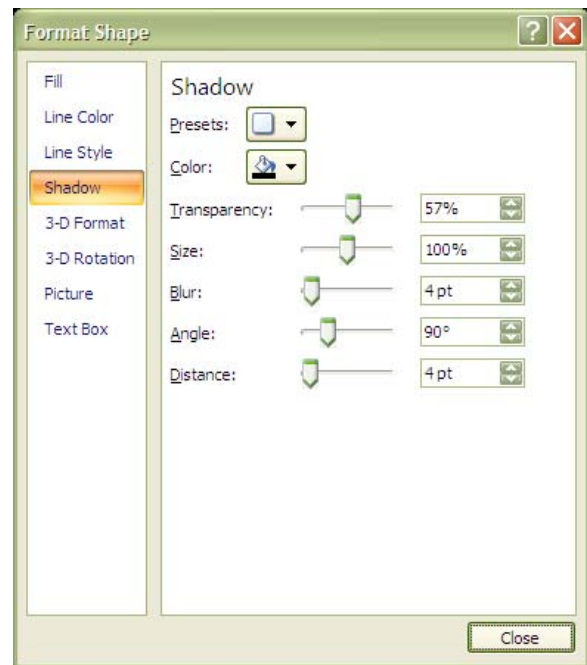


Figure 27 - Format Shape Shadow Effects Dialog Box

NOTE: After selecting one of the preset options, the object can be formatted for a greater effect. Formatting can be done by selecting **Shadow Options...** in the *Shape Effects* drop-down menu. When the *Format Shape* dialog box opens, click the **Shadow** button (if necessary) and make adjustments until the desired effects for the object are displayed (Figure 27).

Advanced Charting Techniques

After creating a chart, additional information or different elements may be added to the chart. Excel allows the user to manipulate any part of the chart as well as add elements. Information in a newly created chart will frequently have to be modified to be presented effectively and clearly.

CHANGING THE AXIS SCALING

When a chart is created, Excel automatically creates a scale for the value (Y) axis based on the data in the chart. This scaling can be changed if desired. The options in the *Auto* section of the *Scale* tab in the *Format Axis* dialog box (see Figure 28) are selected by default. When these options are selected, Excel overrides any manual settings. As soon as the user manually changes any of the scaling values, the corresponding check boxes in the *Auto* section are deselected allowing the manual values to be applied to the chart. To restore the scaling to its original values, reselect the appropriate check boxes in the *Auto* section.

To change axis scaling:

1. Right-click the chart axis to change.
2. Select the **Format Axis...** option. The *Format Axis* dialog box opens (see Figure 28).
3. Click the **Fixed** option button for the **Minimum:** and/or **Maximum:** axis values.
4. Enter the value in the text boxes of the scale ► **Close** button.

NOTE: The **Minimum:** and **Maximum:** settings control range of values on the scale, while the **Major unit:** and **Minor unit:** control the determination of how the axis is divided between the minimum and maximum values and the frequency of major and minor gridlines. The user can also manipulate where the category (X) axis crosses the value axis. The default value is “0”, but it can be any number between the maximum and minimum values.

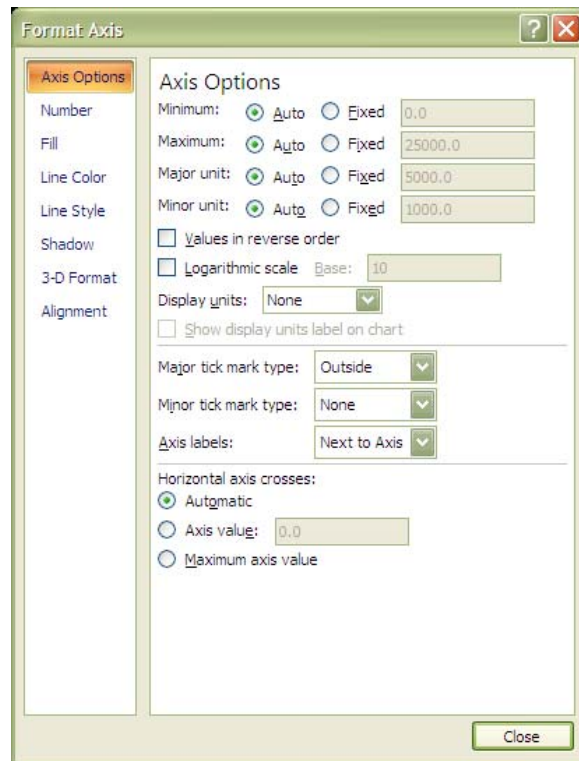


Figure 28 - Format Axis Dialog Box

CHANGING DATA SERIES CHART TYPES

Excel allows mixing different chart types within a single chart to create a combination chart. For example, it might become necessary to show some of the total sales for a product in a column format and at the same time show some in a line format. Mixing chart types can help show the relationships between the data series more accurately and may improve the overall appearance and clarity of the chart (see Figure 29 for an example of a mixed chart).

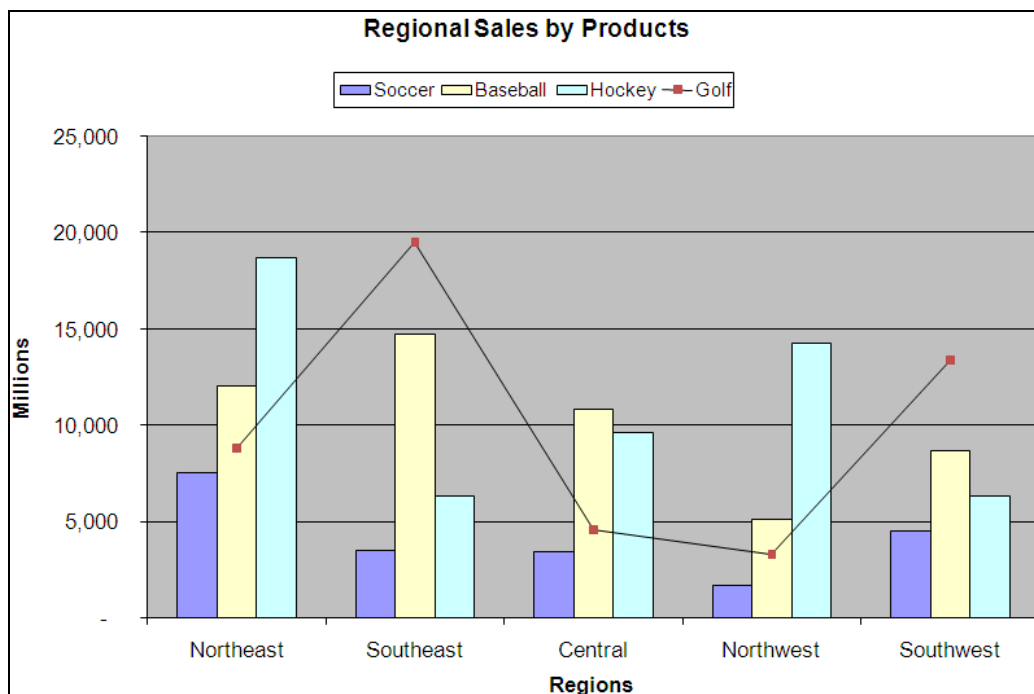


Figure 29 - Sample Mixed Chart Type

To change the chart type of a specific data series:

1. Right-click the relevant data series object on the chart.
2. Select the **Change Series Chart Type...** command. The *Change Chart Type* dialog box opens (see Figure 30).
3. Select the chart category in the left pane.
4. Select the chart type to use from the right pane ► **OK** button.

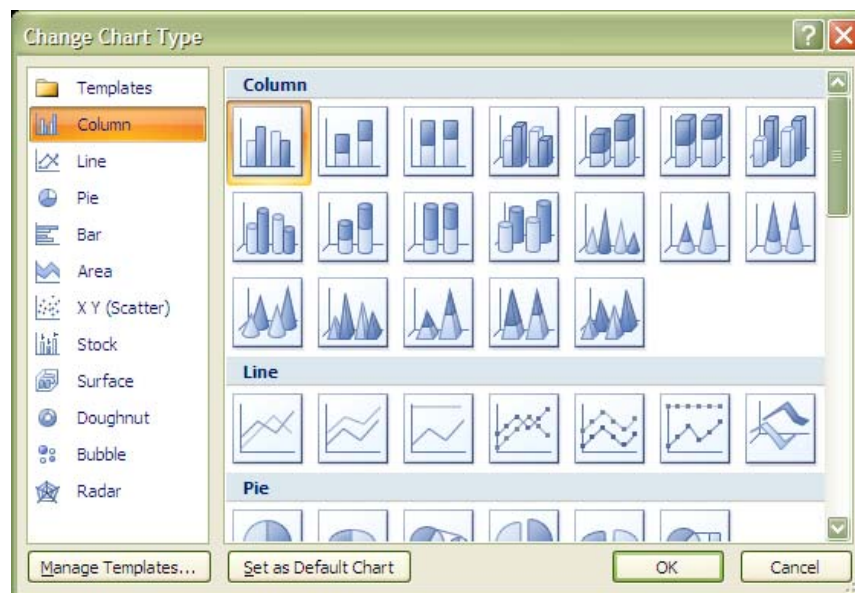


Figure 30 - Change Chart Type Dialog Box

ADDING A TRENDLINE

Because of the varying height of the bars in a column chart, it is sometimes difficult to determine the general direction or trend of the data. Excel enables users to quickly add a trendline to a data series (see Figure 31). A trendline has the effect of smoothing out rough spots in the data of a chart and provides an overall better picture of the data series. Trendlines are commonly used for data charted over time.

To add a trendline to a data series:

1. Right-click the data series object on the chart.
2. Select the **Add Trendline...** option. A trendline is added to the chart and the Format Trendline dialog box opens (see Figure 32).

NOTE: By default, a **Linear** type trendline is added to the chart. Different types can be selected from the *Trend/Regression Type* section of the *Format Trendline* dialog box.

Line Color, Line Style, and Shadow effects can be altered on the trendline if desired by clicking the appropriate button in the left pane of the dialog box. Other options that users frequently find useful is to check the **Display Equation on chart** and **Display R-squared value on chart** options at the bottom of the *Trendline Options* section. Displaying the equation on the chart means that the equation used to determine the trendline will be visible to the user. Displaying the R-squared value provides the user with a good indication of how well the data fits the trendline. The R-squared can range from 0 to +1.00. Generally, the larger the R-squared value, the more accurate will be the predictability of the trendline equation. A trendline can be deleted by selecting it and pressing the **[Delete]** key.

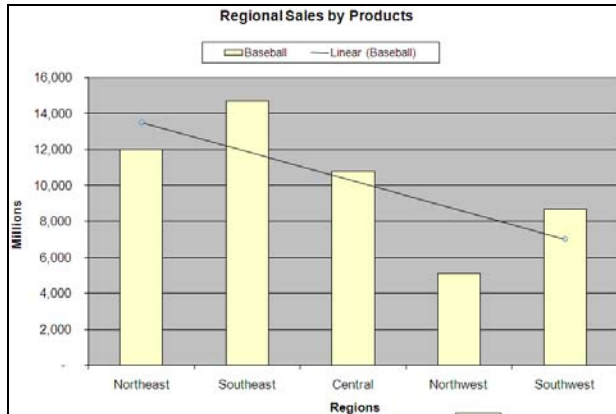


Figure 31 - Sample Chart with Trendline Added

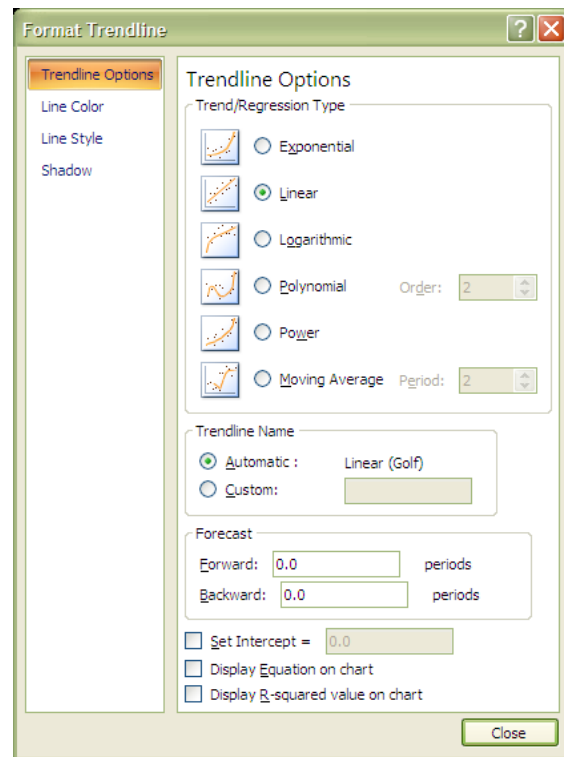


Figure 32 - Format Trendline Dialog Box

NOTE: The [Add Trendline...](#) option may not be available on all chart types, particularly those that use a 3-D visual effect.

Macros

A macro is a program created to automatically perform frequently used operations. It contains all the commands, mouse movements, and user actions necessary to complete a task. Macros can save a considerable amount of time because they can be used to automate repetitive, time-consuming tasks. Macros can be used for simple tasks performed frequently or for complex tasks that require consistency.

DEFINING MACROS

Excel macros are written in the **Visual Basic for Applications** programming language. The series of commands used in a macro is known as a procedure. Each procedure is given a name that is used to execute the macro.

Each procedure is saved in an object called a module. The module is attached to the worksheet where the macro is stored. The module is hidden and cannot be seen in the normal window view. To select the module to view and edit the macro commands, the **Visual Basic Editor** must be used.

NOTE: A macro can be stored in a specific workbook, a new workbook, or a special hidden workbook called the **“Personal Macro Workbook”**. Macros stored in a specific workbook can only be used when that workbook is open. The **“Personal Macro Workbook”** automatically opens when Excel starts. As a result, macros stored in the **“Personal Macro Workbook”** are available to all workbooks.

RECORDING A MACRO

A macro can be created using the macro recorder. Excel records the macro as the user performs the steps to include in it. The steps are not recorded as simple keystrokes but are translated into the Visual Basic for Applications programming language which translates the steps into macro statements.

When recording a macro, Excel creates a module in the current worksheet. As the user performs the macro keystrokes, they are saved as Visual Basic language statements in that module. A module can contain more than one macro. During the macro recording process the user names the macro and enters descriptive information about it. This information is entered in the *Record Macro* dialog box and appears as a comment in the module. If text is going to be selected as part of the macro routine, it must be selected using the keyboard. The macro will not recognize selecting text using the mouse.

Some words are reserved and cannot be used in a macro name; reserved words are usually macro commands, such as “*Date*,” “*If*” or “*Next*.” If a reserved word is used in a macro name, a warning message will open when the user tries to exit Excel. The user will not be allowed to exit the program until the reserved word is changed.

To record a macro:

1. Select the *View* tab on the **Ribbon**.
2. Click the **Macros** drop-down arrow in the *Macros* group.
3. Select the **Record Macro...** option from the drop-down menu. The *Record Macro* dialog box opens (see Figure 33).
4. Assign a name to the macro in the **Macro name:** text box.
5. Select a place to store the macro in the **Store macro in:** drop-down menu.

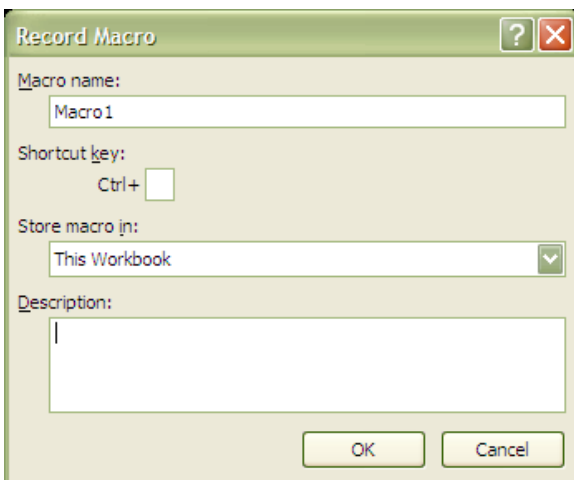


Figure 33 - Record Macro Dialog Box

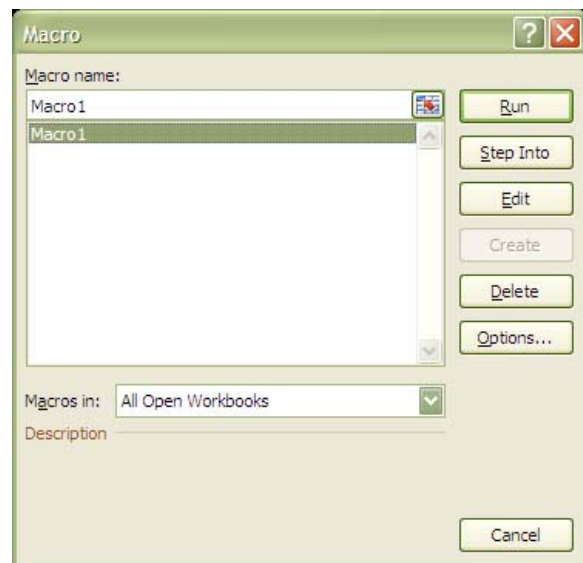


Figure 34 - Macro Dialog Box

NOTE: An optional description of the macro can be entered in the **Description:** text box. Additionally, a shortcut key can be created by entering a letter in the **Shortcut key:** text box. The **[Ctrl] + [letter]** key combination can be used to start the macro once it has been recorded and stored. The shortcut key is case sensitive and users should not choose keys that are already used by Excel.

6. Click the **OK** button and perform the necessary key/mouse commands until the sequence is completed.
7. Click the **Macros** drop-down arrow in the **Macros** group.
8. Select the **Stop Recording** option from the drop-down menu. The macro will cease recording.

RUNNING A MACRO

Macros are saved in modules, and both are saved with the workbook in which they were written unless they are saved in the “**Personal Macro Workbook**”. Before the user can run a macro, the workbook in which it is saved must be open. When a macro is selected run, Excel performs the commands in the same sequence that was performed when it was recorded. Macros in any open workbook can be run from any other open workbook.

To run a macro:

1. Select the **View** tab on the **Ribbon**.
2. Click the **Macros** button in the **Macros** group. The **Macro** dialog box opens (see Figure 34).
3. Select the macro to run, and then click the **Run** button.

Enabling Macros

To function properly, file security must be set to allow macros to run. When a macro is recorded, it can be immediately run. The effect of any security settings will not be seen until the workbook has been closed with all changes saved. The default security setting in Excel is to disable all macros when a file containing them is opened. The user then has the option to enable the disabled content.

To enable macros when opening a file:

1. Open the file. A message bar will appear at the top of the worksheet (see Figure 35).
2. Click the **Options...** button on the message bar. The Microsoft Office Security Options dialog box opens (see Figure 36).
3. Click the **Enable this content** option button ► **OK** button. The content will be enabled, the dialog box will close, and the message bar will disappear.

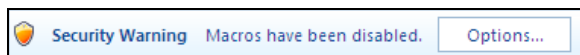


Figure 35 - Message Bar

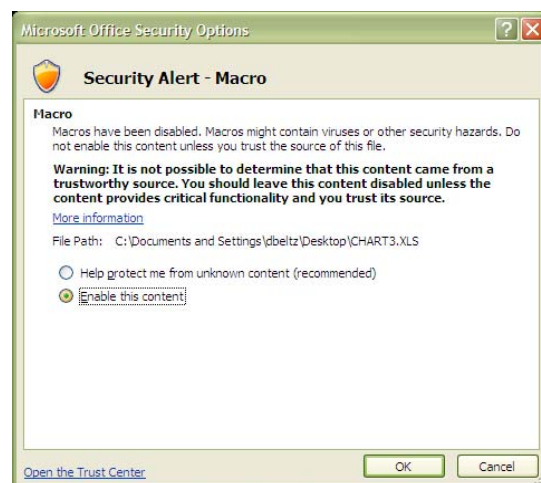


Figure 36 - Microsoft Office Security Options Dialog Box

DELETING A MACRO

Macros that are no longer useful can be deleted. Since macros can invoke other macros, make sure that the macro being deleted is not needed by another macro. If a macro is stored in a workbook, the workbook must be open to delete the macro. If the macro is stored in the “*Personal Macro Workbook*” (which automatically loads as a hidden window every time Excel is opened) the “*Personal Macro Workbook*” window must be unhidden before the macro can be deleted, even though the macro may be visible in the Macro dialog box.

To unhide the Personal macro workbook:

1. Select the **View** tab on the **Ribbon**.
2. Click the **Unhide** button in the **Windows** group. The *Unhide* dialog box will open (see Figure 37).

NOTE: The *Unhide* dialog box displays all hidden workbooks.

3. Select the “PERSONAL” workbook ► OK button. A workbook named “PERSONAL” will open.

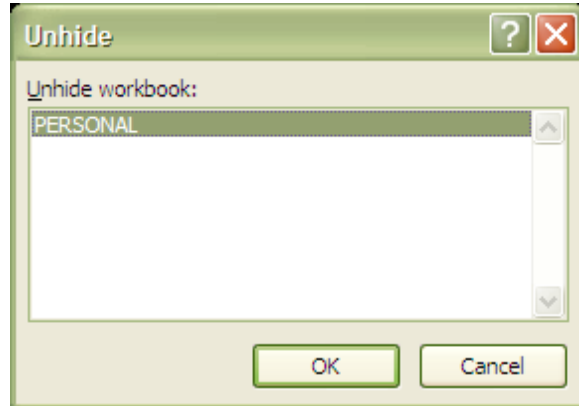


Figure 37 - Unhide Dialog Box

To delete a macro:

1. Select the **View** tab on the **Ribbon**.
2. Click the **Macros** button in the **Macros** group. The *Macro* dialog box opens (see Figure 34).
3. Select the macro to delete, and then click the **Delete** button.

Working with the Database Features in Excel

Although manipulation of numeric data is Excel’s primary purpose, the row-and-column format lends itself in creating and storing databases. Generally, a good rule of thumb is that if the worksheet grows to more than 2000 rows, then the data should be stored in a data warehouse or relational database such as **Microsoft Access**.

USING A DATABASE

A database is a collection of information arranged in a way that makes it easy to access. For example, a telephone book is a static database arranged in alphabetical order. Because it is static, the information cannot be rearranged. In real-world applications, the capability is needed to manipulate a database. This capability is known as database management.

Excel has built-in database management capabilities. The user can treat a worksheet, or portions of a worksheet, as a database. An Excel database can help in entering, editing, locating, sorting and analyzing information. In Excel, the user can define any continuous collection of data as a database. The columns contain the field categories and the rows contain the record data. Additional rows can also be inserted as records are added to the database. A valid database does not contain any blank columns or rows.

NOTE: The user can also work with tables created in other Microsoft Office 2007 programs by copying and pasting the lists into Excel.

CREATING AND SAVING A DATABASE

Before creating a database the user must consider the specific information to collect (that is, the fields or categories of information). For example, it is necessary to track a client name, address, city, state, zip code, telephone number, invoice number, date of invoice, amount of invoice and the sales representative's commission. One field can be created (or one column used) for each type of information.

A field occupies a single column of a database and contains a single piece of information in each record. For example, a “*Salary*” field might contain salary information for each employee record. The user can enter text, numbers, formulas, dates, or functions into a field. A computed field contains formulas or functions. Excel uses the top row of the list (the column label) as the field name.

Proper planning can save hours of additional work at a later date. For example, to sort a database by last name, it is necessary to create two fields (one for the first name and one for the last name). It is difficult to enter the first and last names in a single field and then sort by last name.

Once the field names for a database have been created, it is time to enter records. Each row of a database contains one record. A record contains all the information related to one entry. For example, an employee record could contain the name, address, telephone number, and salary information of a single employee. Although each record contains all the fields in the database, every field is not necessarily required to contain data.

To create a database in Excel:

1. Create a new Excel file and input the data as is normally done.
2. Select the cell to enter the first column label.
3. Type in the desired column label.
4. Press the tab key on keyboard to move to the next cell in the row.
5. Enter additional database field labels as needed.
6. When the fields have been labeled, enter records for each field.

NOTE: Previous versions of Excel allowed the user to save the worksheet with a “.dbf” file extension that allowed the worksheet to be opened by a database program. Excel 2007 no longer has that feature available. Instead, the user must save the worksheet and then import it directly into Access 2007. See the Intermediate Access Handout for the Microsoft Office 2007 series for step-by-step instructions on importing an Excel worksheet.

MODIFYING A DATABASE

A user can modify a database by adding and/or deleting records and fields. New records can be added to the end of the database or a new row can be inserted in the database to add a record in a particular location. The user can also delete records by deleting the row that contains the record. When a row is deleted, Excel adjusts any database ranges as needed. If the user simply clears the contents of a record, the blank row will cause problems when sorting and locating records within the database.

After a database has been created, sometimes there is a need to track additional information. The user can insert columns into the database to create additional fields as needed. Conversely, the fields that no longer need to be tracked can be deleted. Deleting unnecessary fields produces a more efficient database and faster sorts and queries. Modifying a database by editing the information happens the same way as editing any worksheet. The user can change the

information in any field by editing it on the **Formula** bar or by typing over the old information in the cell. The information can also be copied from one cell to another.

A valid database list cannot contain any blank columns or rows.


NOTE: A database can be formatted using any of the Excel formatting features.

When a row is deleted, all the information in that row is deleted across the entire worksheet. Before deleting a row, make sure that there is no information in the row that should be retained.

VIEWING RECORDS USING THE DATA FORM

Viewing records in the data form allows easy navigation between records. The data form displays one record at a time. If a list has hundreds of records, the data form allows quick scrolling to the desired record. When the scroll box in the scroll bar is dragged, the counter in the upper right corner of the data form indicates which record will appear when the mouse button releases. The data form can only be accessed by customizing the **Quick Access Toolbar**.

To customize the Quick Access Toolbar and view records using data form:

1. Click the **Customize Quick Access Toolbar** drop-down arrow .
2. Select the **More Commands...** option. The Excel Options dialog box opens.
3. Set the **Choose commands from:** drop-down list to **All Commands**.
4. Scroll down the list of available commands and select **Form...**.
5. Click the **Add >>** button to add the command to the toolbar ► **OK** button.
6. Place the cursor in a field in the first record.
7. Click the **Form** button on the **Quick Access Toolbar**. The record will open in the data form (see Figure 38).




Figure 38 - Viewing Records Using Data Form

NOTE: Pressing the **[Enter]** key or the **[Shift+Enter]** key combination will move to the next or previous records, respectively. The **[Page Up]** and **[Page Down]** keys move you through multiple records in the database using one keystroke.

EDITING RECORDS USING THE DATA FORM

The data form can be used to edit records. In the data form, each field appears in its own text box. The data in the text boxes are edited the same way as in a worksheet.

To edit a record in data form:

1. Open the records in the data form.
2. Display the record to edit.
3. Select the text in the field to edit.
4. Edit the text as desired.
5. Press the **[Enter]** key.

NOTE: The changes can be canceled and the original data can be restored by clicking the **Restore** button on the data form (see Figure 38) before pressing the **[Enter]** key and moving to another record.

ADDING RECORDS USING THE DATA FORM

Records can be added to the database by using the data form. New records are appended to the end of the database. Any existing named ranges in the list do not expand to include the new records.

NOTE: Pressing the **[Tab]** key or the **[Shift+Tab]** key combination moves to the next and previous fields, respectively. The insertion point moves to the **New** button when the **[Tab]** key is pressed from the last field in a record.

To add a record using the data form:

1. Open the records in the data form.
2. Click the **New** button. A new record appears in the dialog box with all blank fields.
3. Type the information in the field(s) of the dialog box.
4. Click the **Close** button to close data form. Scroll as necessary to verify that the new record appears correctly at the end of the database.

DELETING RECORDS USING THE DATA FORM

When a user no longer needs a record or it becomes irrelevant, the record can be deleted from the data form. The record is deleted from the worksheet as well.

To delete a record from the data form:

1. Open the records in the data form.
2. Display the record to delete.
3. Click the **Delete** button. A message box asking for confirmation of the deletion appears.
4. Click the **OK** button.

NOTE: The **Delete** button in the data form dialog box should be used with caution. Once a record is deleted from the data form, it cannot be restored.

SORTING DATABASE RECORDS

Users can sort data in a table according to the entries in a particular column. A table is a range of cells organized with similar sets of data in each column. For example, the user may have a table containing employee data, with columns for the first name, last name, department, salary, and age. Users can sort the list alphabetically by employee name or numerically by salary. It is also possible to group the employees alphabetically by department.

Excel uses the following guidelines when sorting data:

1. Rows with duplicate items in the sort column remain in their original order.
2. Rows with blank cells in the sort column are placed last in the sorted list.
3. Hidden rows are not moved.

NOTE: If the user wants to be able to restore a list to its original order, a column must be included containing sequential numbers to denote the original position of each row before the data is sorted. The table can then be sorted by this additional column to restore the list to its original order.

Lists can be sorted by more than one column by selecting the *Data* tab on the **Ribbon** and clicking the **Sort** button in the *Sort & Filter* group. The *Sort* dialog box (see Figure 39) opens

and allows the user to specify any number of columns to sort by. Additional columns can be specified by clicking the **Add Level** button on the *Sort* dialog box. An order of precedence is followed in the sort schema. Users should designate the first column to sort by as the most general and the last column as the most specific.



Figure 39 - Sort Dialog Box

SORTING RECORDS IN ASCENDING/DESCENDING ORDER

A list can be sorted in either ascending or descending order. Ascending order sorts a list from the lowest to highest value. Descending order sorts a list from the highest to lowest value. Lists are sorted by the column that contains the active cell.

The order of an ascending sort is listed below:



1. Numbers are sorted from the smallest negative number to the largest positive number.
2. Dates and times are sorted based on their chronological value.
3. Text and text that includes numbers is sorted as follows: 0 1 2 3 4 5 6 7 8 9 (space) ! " # \$ % & () * , . / : ; ? @ [\] ^ _ ` { | } ~ + < = > A B C D E F G H I J K L M N O P Q R S T U V W X Y Z.
4. False logical values are sorted before true logical values.
5. All error values are equal and are not sorted.
6. Blanks are always sorted last.



In a column of mixed data, the ascending sort order is numbers, dates, text, logical values, error values, and blanks with items within each category sorted in ascending order. Descending sorts list data in the reverse order of ascending sorts, except for blanks. Blank cells are always sorted last. Therefore, in a column of mixed data, the descending sort order is error values, logical values, text, dates, numbers, and blanks with items within each category sorted in descending order.

NOTE: Apostrophes (') and hyphens (-) are ignored in a sort, unless two items are identical except for the apostrophe or hyphen. In that case the apostrophe or hyphen is sorted last in an ascending sort and first in a descending sort.

To sort a list in ascending or descending order:

1. Click in the column of data that will be sorted.


2. Select the *Data* tab on the **Ribbon**.
3. Click the sort **Ascending** button  or the sort **Descending** button .

An alternative sort method is to right-click in the column of data, select the  option and then select the sort order. Additionally, users can click the  button on the *Data* tab of the **Ribbon** to open the *Sort* dialog box (see Figure 39).

Using the Version Compatibility Checker

A new feature in several of the Microsoft Office 2007 applications is the *Compatibility Checker*. The *Compatibility Checker* will inspect workbooks created in Excel 2007 to see if the worksheets contain objects such as *SmartArt* that are incompatible with earlier versions of Excel.

To run the Compatibility Checker:

1. Click the **Office Button**.
2. Select the  option.
3. Select the **Run Compatibility Checker** option. The *Microsoft Office Excel Compatibility Checker* dialog box opens (see Figure 40). Any incompatible items will be identified in the dialog box.
4. Click the **OK** button to close the dialog box.

NOTE: If no incompatible items are identified in the workbook, the dialog box will still open and indicate that no incompatible items were found.

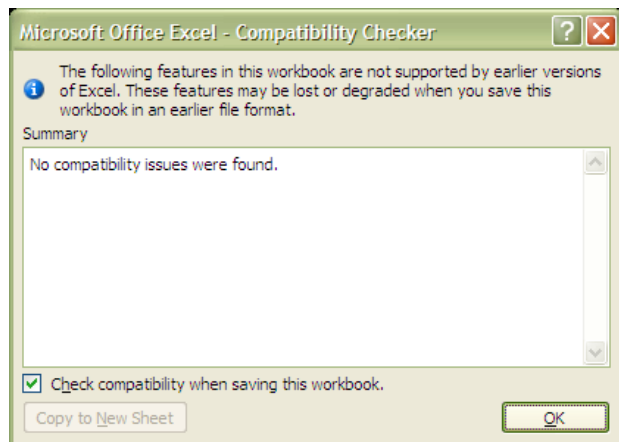
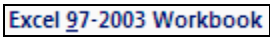




Figure 40 - Microsoft Office Excel Compatibility Checker Dialog Box

By default, Excel will check the backward compatibility of any presentation when it is saved in the  format. If no incompatible items are found, the *Microsoft Office Excel Compatibility Checker* dialog box will not open. If an incompatible item is identified and the user proceeds to save the workbook, the incompatible item will be degraded so that the workbook will open in an earlier version of Excel. For example, *SmartArt* objects will be converted to non-editable images that will open in the earlier version.

Using the Document Inspector

Another new feature in Microsoft Office 2007 applications is the *Document Inspector* feature. Workbooks may sometimes contain hidden or personal information that a user may be unaware of, or does not want to share with others if copies of the workbook will be distributed. Personal information can also become embedded in the form of metadata when workbook properties are set. The *Document Inspector* will identify any potential information that a user may want removed before distributing a workbook and give the user the option to remove it.

To use the Document Inspector:

1. Click the **Office Button**.
2. Select the  option.
3. Select the  option. The *Document Inspector* dialog box opens (see Figure 41).

4. Users are presented with six categories of information that the *Document Inspector* will search for. Each of the categories can be either selected or deselected by the user with the associated check boxes.
5. When the categories have been selected, click the **I**nspect button.

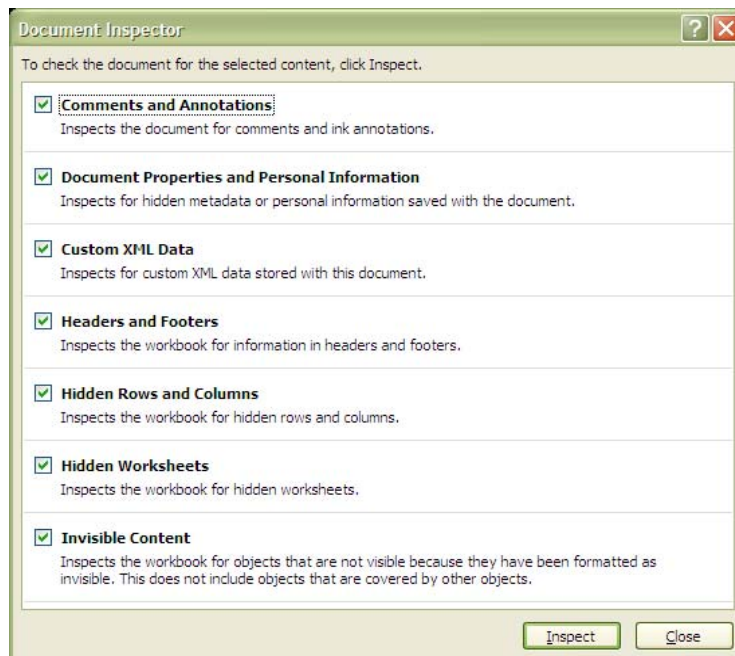


Figure 41 - Document Inspector Dialog Box

6. When the *Document Inspector* completes its search, the *Document Inspector Results* dialog box will open (see Figure 42).
7. If any potential personal information is found within the document, the user can choose to ignore it or eliminate it by clicking the **R**emove All button.
8. The user can re-inspect the document by clicking the **R**einspect button, or, if no further actions are needed, click the **C**lose button.

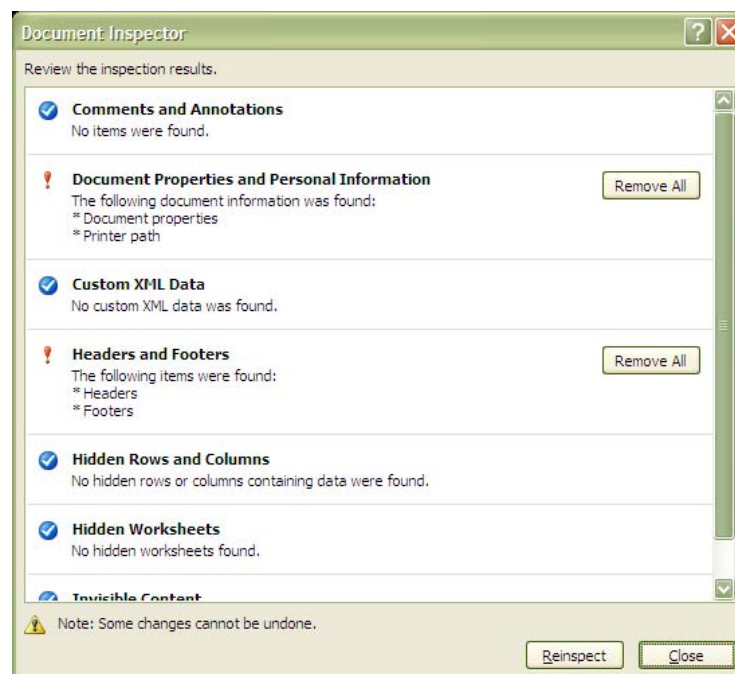


Figure 42 - Document Inspector Results Dialog Box