CHAPTER ONE

GETTING STARTED WITH EXCEL

INTRODUCTION

Today, when you purchase a computer today it is likely to have been preloaded with the popular Windows based suit of programs called Microsoft Office. Applications that form the Microsoft Office suit are Microsoft Word (a word processor for creating professional documents), Microsoft Access (database management application for creating and maintaining databases), Microsoft PowerPoint (presentation software), Microsoft Outlook (, Microsoft Publisher, and Microsoft Excel. The Excel is a spreadsheet application.

SPREADSHEETS AND THEIR USES

A spreadsheet (also known as an Electronic Spreadsheet) is a piece of software (computer program), which is simply the electronic equivalent of the accounting worksheet. Both consist of rows and columns. The intersection of the rows and columns are used to store numbers and text and is capable of a wide range of manipulations from simple arithmetic calculations such as totals, products or percentages, to complex automated calculations and analysis.

Spreadsheets are widely used in research, industry and business for storing, manipulating, Comparing data and for planning and forecasting. Below are some of the major areas that spreadsheet can be used.

1. In Accounting field: - financial and other non-financial institutions such as KNUST, CSIR, SSNIT, Bank of Ghana, etc. can use spreadsheet for the following:

i). Preparation of budgets, Balance sheet, Trial Balance, analysis of cash flows, costing projects, managing inventory, payroll, and other financial plans involving income and expenditure.

ii) Discounts, Loan, taxation, investment, interest and interest rate calculations.

iii) For predicting or forecasting into the future.
(iv) Investment proposals, and many other tasks.

2. Scientific environment: Scientist such as Mathematicians, Engineers, Physicists, Chemists, meteorologists, statisticians, biologist, etc. use spreadsheets to perform statistical computations such as averages, standard deviations, variance, R-Squared, etc. They can also use spreadsheet to calculate regression coefficients, perform analysis of variance (ANOVA), to solve simultaneous equations (i.e. systems of linear equation), to build frequency distribution tables, etc.

3. Graphical Representation: Spreadsheets are used in many disciplines to represent data graphically for easy analysis such as Pie chart, Histogram, line graphs, etc. For example, hospitals, statistical division, etc. can use spreadsheet to represent information such as mortality values, morbidity values, the trend of cases with respect to an outbreak of a disease, etc. in graphical forms.

4. Forex bureau and other multi-national companies use spreadsheets for their currency conversions. For example, using a spreadsheet it is possible to convert from one currency to another without having to use any calculating device.

5. Database management: Businesses and individuals can use spreadsheets for maintaining their data base. It allows them to perform operations such as sorting the data in their database, extracting information/records from a given database, etc. Spreadsheet can also be used in the preparation of pay vouchers, etc.

Spreadsheets are particularly good at providing answers to the "what if …?" type of questions which occur very frequently in business. For example builders or architects may use a spreadsheet to assist in the design of a storm drain. In this case, they would want to know the answer to a question such as "what if we change the diameter of the storm drain, how will that affect the rate of flow of water carried along it? Also, a business may want to know what will happen to profit if income and expenditure values over a certain period increase or decrease. Will the architect, builders or businesses have to perform all the calculations again? The simple answer is NO. Whenever there is a change in one value Excel for example will automatically update or recalculate all values that are dependent on the changed value. In this way a spreadsheet can be used not only for creating financial statements or budgets but also as a planning tool.

There are a number of spreadsheets packages one can choose from **AS-EASY-AS, SUPERCALC, LOTUS 1-2-3, SYMPHONY, QUATROPRO, FRAMEWORK IV, EXCEL, etc.**

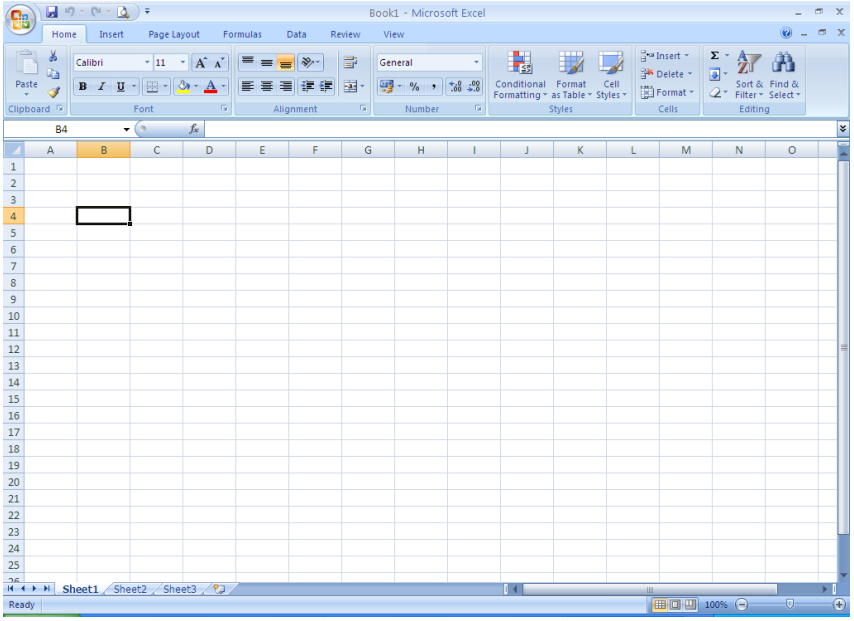
The term spreadsheet is often used to refer to the computer program. Sometimes the same term is used to refer to the sheet on which the work is done. Some spreadsheet programs use the term "worksheet" for this.

STARTING AND QUITTING EXCEL.

To start the Excel application, follow these steps.

1. Click the Start button on the taskbar at the bottom left of the screen.
2. Move the mouse pointer over the **All Programs** command, then over the **Microsoft Office** and then over **Microsoft Excel** and click.

Another way you can start Excel is from a shortcut icon on the desktop. Double-click the EXCEL short-cut icon on the desktop. When Excel starts you will obtain the following initial screen.



You also can start an existing or specific excel document by clicking the start menu, moving the pointer over the **My Recent Documents** folder, and then clicking the Excel document you want loaded. If Excel is not running, Excel will automatically start and load the document provided excel is installed on your computer. If Excel is running, it will load the document and activate Excel so that it is on top of other windows. If the Excel document is not in my recent documents folder, then locate the file wherever it may be and double click on the required filename to open the file.

To Close or quit Excel in order to free memory for other applications or at the end of the day when you have finished working, follow these steps.

1. Using the mouse, click the **File** menu and then click the **Exit** command or click the X in the top right corner. To choose this command using the keyboard press Alt + F and then press X. Alternatively, press the shortcut key combination Alt + F4, which closes Excel without using the file menu.

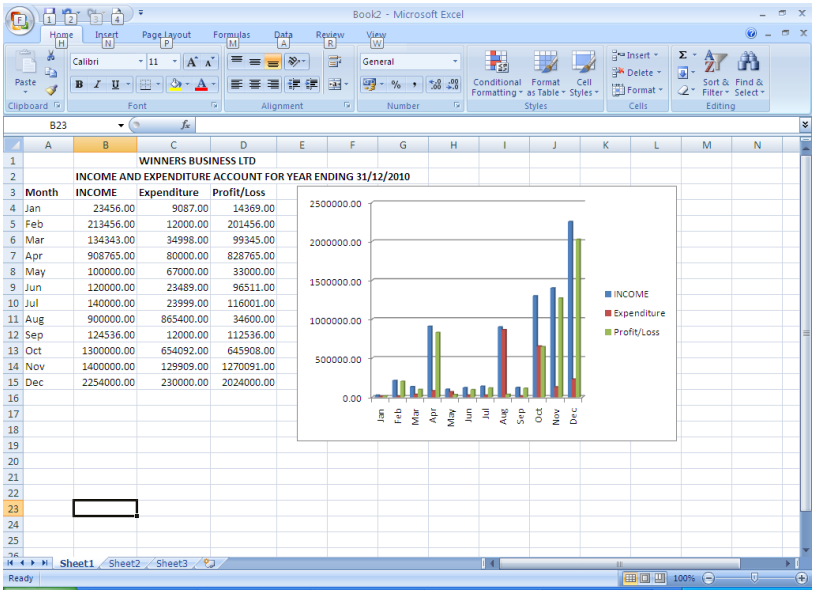
2. If you made changes to any loaded workbook, Excel displays an alert box asking whether you want to save your current work or not. Choose Yes or press Enter to save your work, or choose No or press Tab and then Enter to quit without saving.

3. Repeat step 2 for any other alert boxes that appear. An alert box appears for each workbook you have open on-screen that has been changed.

When all workbooks are closed, the Excel window closes, and the application is terminated. Another way to quit Excel is to double-click the control icon at the left of the Title bar.

THE EXCEL INITIAL SCREEN

One advantage of Windows applications is the capability to run several applications and display them on-screen simultaneously. One can run Excel and office applications together and transfer information among them. This can save you time when you, for example, transfer data into or out of Excel, transfer charts to graphics programs for further enhancements, create updateable links between Excel worksheets and windows applications or embed Excel data into other Windows applications. Figure 1 shows the elements of the Excel application window and an open Excel workbook.

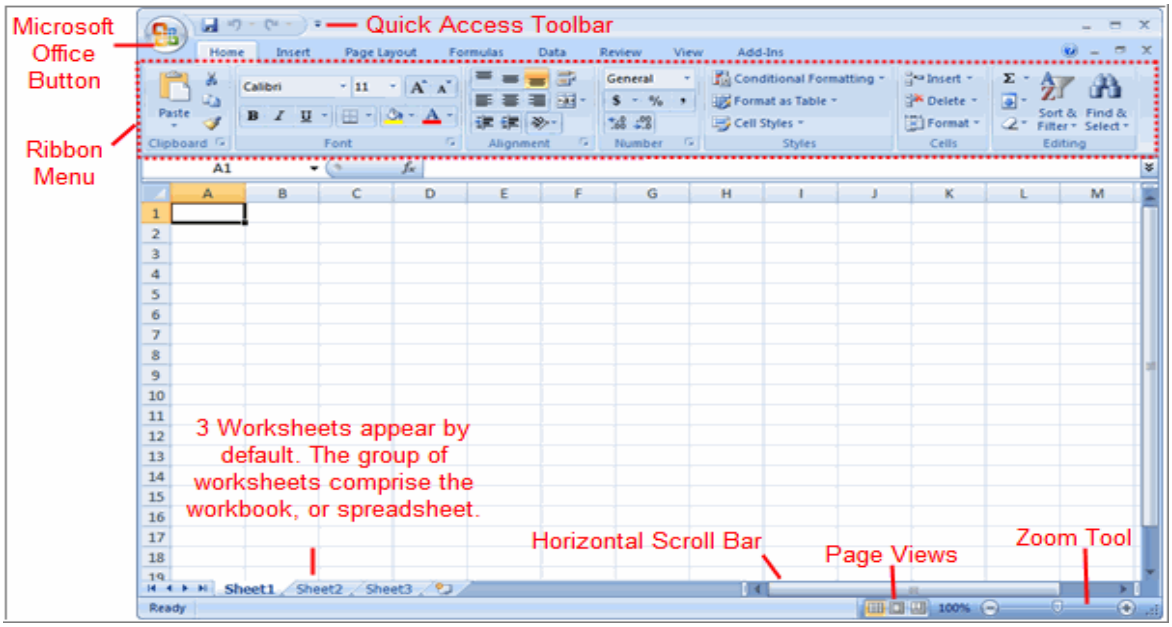


Exploring and Setting up Your Excel Environment

It is sometimes a good idea that before you begin creating spreadsheets in Excel you have to set up your Excel environment and become familiar with a few key tasks and features such as how to minimize and maximize the Ribbon, how to configure the Quick Access toolbar, switch page views, and access your Excel options.

The **tabbed Ribbon menu system** enables you to navigate through Excel and access the various Excel commands. If you have used previous versions of Excel you would have noticed that the Ribbon system has replaced the traditional menus. Above the Ribbon in the upper-left corner is the **Microsoft Office Button**. From here, you can access important options such as New, Save, Save As, and Print. By default the **Quick Access Toolbar** is pinned next to the Microsoft Office Button, and includes commands such as Undo and Redo.

At the bottom, left area of the spreadsheet, you will find worksheet tabs. By default, three worksheet tabs (sheet 1, sheet 2 and sheet 3) appear each time you create a new workbook. On the bottom, right area of the spreadsheet you will find page view commands (normal, page layout and page break preview), the zoom tool (from 10% to 400%), and the horizontal scrolling bar. At the extreme right side of the screen is the vertical scrolling bar.



The Application Window

- The window within which Excel runs.

Workbook Window

- A window within the Excel application window in which a worksheet, macro sheet, charts, or dialog box is displayed.

Active Workbook Window

- The Excel workbook window that currently accepts entries and commands; this window has a solid title bar and is normally the top window.

Inactive Workbook Window

- An open window that contains Excel information, but currently is unaffected by commands; such a window normally has a gray title bar and is behind the active workbook window.

Workbook bar

- The bar of a minimized workbook within the Excel application window.

Title Bar

- The bar at the top of an application or workbook window; it usually displays the name of the program along with the name of a workbook or file upon which the window is based, and also can contain Minimize, Maximize, Restore, and Close icons.

Ribbon Menu Bar

- A list of menu names displayed below the title bar of an application. Excel commands are grouped into related functions and placed on the menu bar.

Formula Bar

- The area of the screen where you enter or edit text, numbers, or formulas. It also provides information about the active cell.

Named Box

- It is located on the left hand side of the Formula bar and displays the cell reference (or address) of the active cell or the cell name.

Status Bar

- A bar at the bottom of the screen that shows what Excel is prepared to do next. It displays information about the worksheet and the currently active cell. It includes the indicator.

Indicators

- These display mode of operations, such as NUM when the numeric keypad is on, SCRL when the Scroll Lock Key has been pressed or EXT when Extended mode is on.

Sheet tabs

- These tabs enable you to switch to a specific sheet in a workbook. The sheet tabs also identify the current worksheet.

Tool Bars

- A bar containing buttons giving quick access to commands and procedures, such as bold, italic, create chart, styles, and drawing buttons. A toolbar can be moved to a different location and reshaped.

Standard Toolbar:

- Contains the buttons most frequently used for formatting, file handling, and printing.

Formatting Toolbar:

- Contains buttons used for formatting fonts, setting alignment, applying numeric formats, formatting borders, and applying shading.

Worksheet Area:

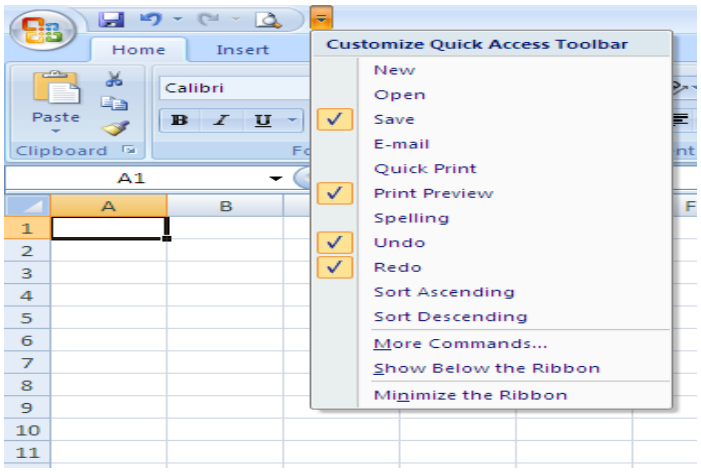
- A collection of cells where information such as text, numbers or formulas are entered.

Horizontal and Vertical Scroll Bars

To Add Commands to the Quick Access Toolbar:

Excel allows you to either add or remove items from the Quick Access toolbar. You will normally want to add commands that you will use more frequent as compared to the others. To add a command the needed steps are as follows:

- Click the **arrow** to the right of the Quick Access toolbar to obtain the customize Quick Access toolbar as shown in the figure below. You will find command(s) that currently appear in the Quick Access toolbar already checked with a tick.
- Select the **command** you wish to add from the drop-down list by checking the command.



Or

If the command you wish to add is not part of the command appearing in the customize quick access toolbar you can still have it added by following the steps below:

- Select **More Commands** from the menu and a dialog box appears.
- Select the command you wish to add.
- Click the **Add** button.
- Click **OK**.

The **Save, Undo, and Redo commands appear by default in the Quick Access toolbar**. You may wish to add other commands to make using specific Excel features more convenient for you.

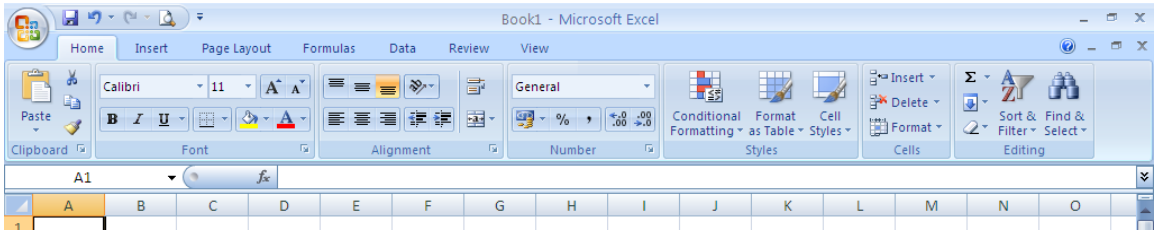
To Minimize and Maximize the Ribbon

The Ribbon can be maximised or minimised depending on which commands you will want to see on the screen.

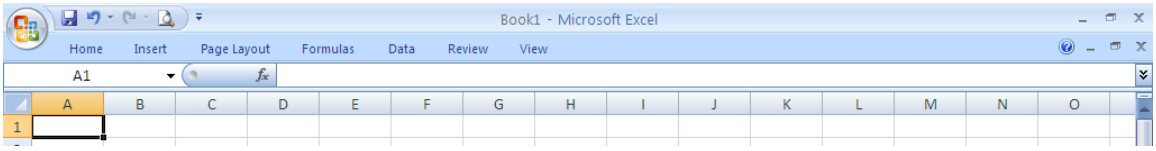
- Click the **drop-down arrow** next to the Quick Access toolbar.
- Select **Minimize Ribbon** from the list. The Ribbon disappears.
- To maximize the ribbon, click the arrow again and select **Minimize the Ribbon** to toggle the feature off.
- You can also minimize and maximize the Ribbon by right-clicking anywhere in the main menu and selecting **Minimize the Ribbon** in the menu that appears.
- The new, **tabbed Ribbon system** replaces traditional menus in Excel 2007. It is designed to be responsive to your current task and easy to use; however, you can

choose to **minimize the Ribbon** if you would prefer to use different menus or keyboard shortcuts.

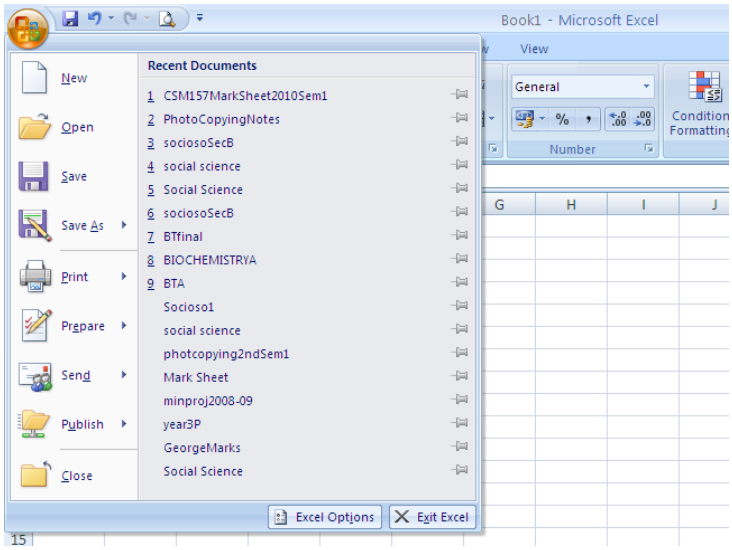
A maximized ribbon appears as follows:



While a minimized ribbon appears as shown below:



The Microsoft Office Button



The **Microsoft Office Button** appears at the top left of the Excel window. When you click the button, a menu appears as follows:

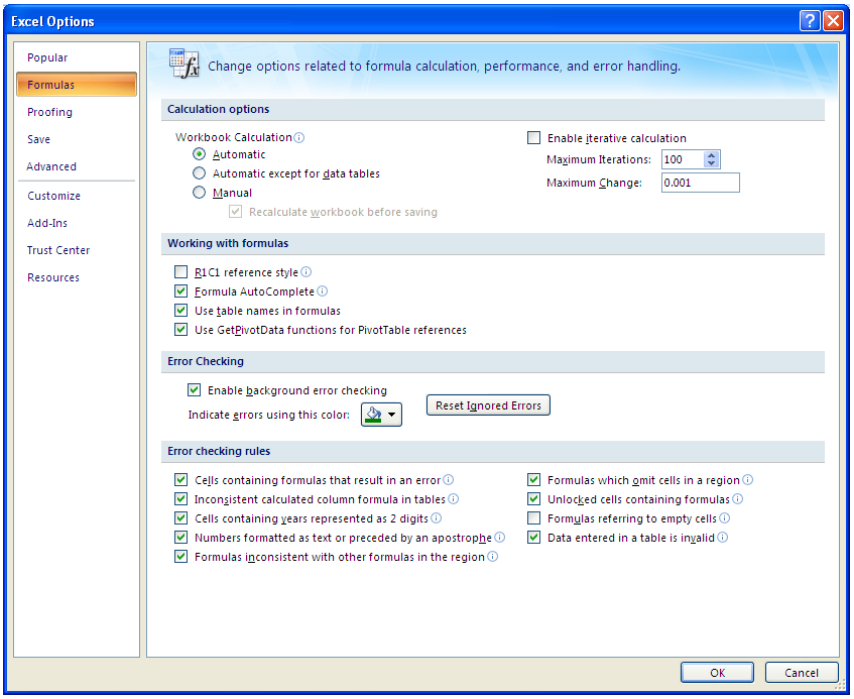
From this menu it is clear that you can create a new spreadsheet (by selecting new), open existing files (by selecting open), save files in a variety of ways (by selecting save or saves us), and print (by selecting print). You can also add security features, send, publish, and close files.

Changing the Default Excel Options:

Excel has a number of options that you can define after installing the application program or later if the need be. For example, by default your workbook is automatically saved using the office 2007 formatting. This means that you cannot use an earlier version to

open your worksheet. You may therefore want to change the default save format setting to say Excel 93-2003 format. By this all subsequent worksheet that you create will be saved using the new format. Change any of the default settings; you will have to following the steps below:

- Click the **Office Button**
- Click the **Excel Options** button. A dialog box will appear.
- Select a **category** on the left to access different Excel options. For example, if you select that Formulas category you will obtain the following screen.



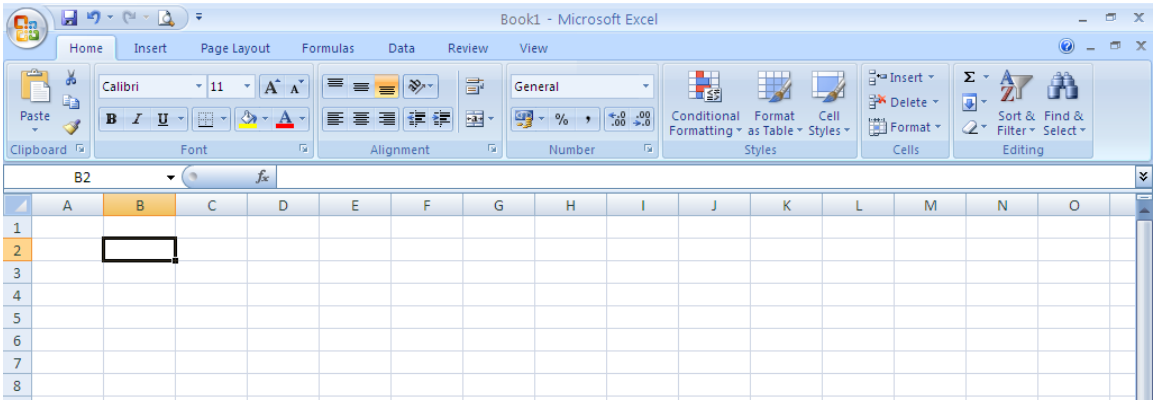
- Modify any of the default settings.
- Click OK.

As you learn more about Excel and become proficient at using it, you may want to modify some of the settings. As a **beginning user**, it is usually best to **leave** the **default settings** as they are unless it is very necessary.

Understanding Workbooks And Worksheets

Workbooks are collections of worksheets stored in the same file on disk. Sheets may contain different types of information; usually the sheets in a workbook contain related

information, such as budgets, with each sheet containing the budget for a different sales region within the division. It's easy to make simultaneous changes and edits to all of a workbook's sheets at one time or to consolidate related sheets, or to do math involving numbers from multiple worksheets.



The area under a particular alphabet (e.g. A through to O as shown in figure above) and bounded by two vertical lines is called a **COLUMN** while the bar after a particular digit and bounded by two vertical lines (1 through 8 as shown in the above figure) is called a **ROW**. Each worksheet has sixteen thousand three hundred and eighty-four (16,384) columns labelled as follows from left to right: A through Z, AA through AZ, BA through BZ, CA through CZ, DA through DZ, etc. up to XFA through XFD. There are One Million forty-Eight thousand five hundred and seventy-six (1,048,576) rows labelled 1 to 1048576 from top to bottom. The column letters and row numbers are used to uniquely identify columns and rows respectively. The intersection of a row and column form a **CELL** in which you can enter information or a formula. Each cell has an address made up of its column letter(s) and row number e.g. A8, P16, BB100, AK47, and XFA98766. Please note that no two cells can have the same address as each cell occupies a unique location on the worksheet for storing and displaying data. The Excel work area forms a window through which we view a portion of the entire worksheet.

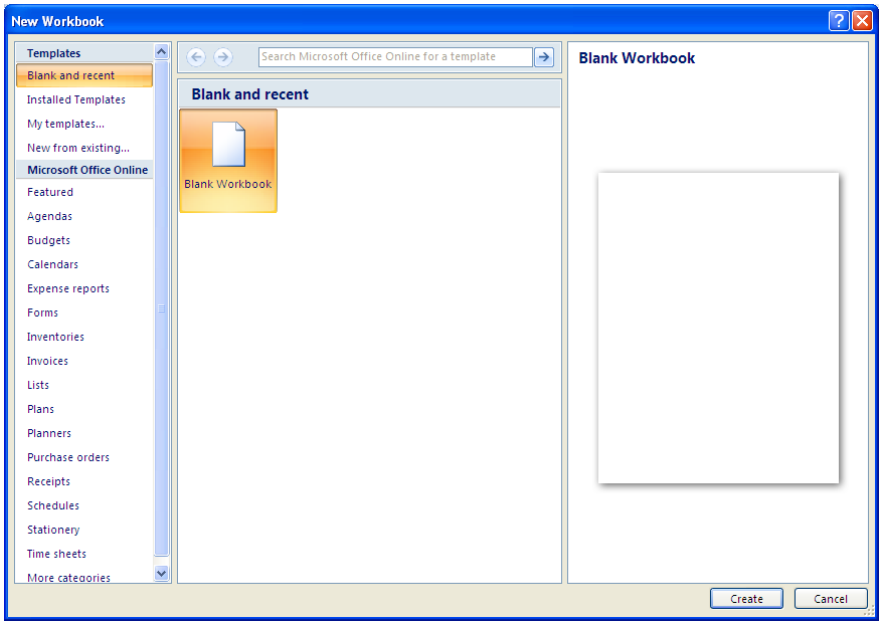
Creating your first workbook

Whenever you start Excel, you are presented with an initial or a new workbook to start with. Once the screen is obtained you can start entering information into cells. You will therefore need to know how to **insert text** and **numbers** into Excel workbooks to be able

to use it to calculate, analyze, and organize data. Note that if Excel has already been started you can still create a new workbook by following the steps below:

To Create a New, Blank Workbook:

- Click the **Microsoft Office Button**.
- Select **New**. The New Workbook dialog box opens and Blank Workbook is highlighted by default.

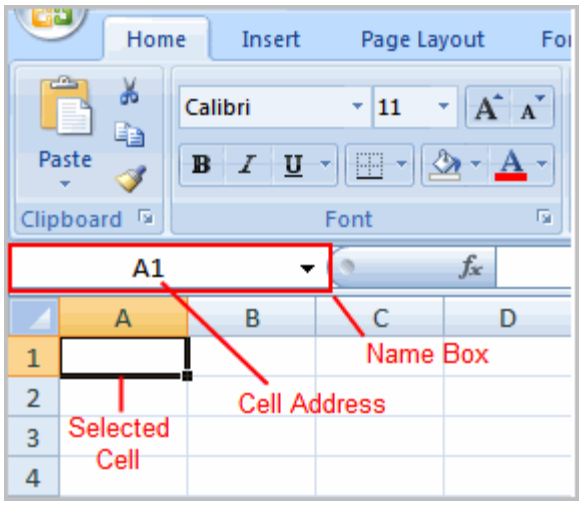


- Click **Create**. A new, blank workbook appears in the window.

Entering Data

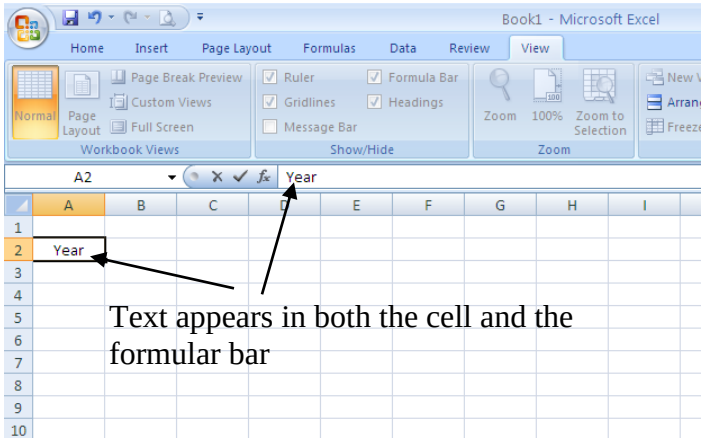
Once you have a blank workbook on your screen you can start creating your workbook by entering data. A data refers to numbers (with or without fixed decimal points), text, dates, etc. To enter data into any cell, you must first know the cell and then follow the steps below:

- Click a **cell** to select it. As you select a cell, the **cell address** appears in the **Name Box**.



- Enter **text** into the **cell** using your keyboard. The text appears in the cell and in the **formula bar**. After entering the text, you can either press the enter key or any of the cursor control keys depending on where cell into which a data was entered.

You can repeat the above steps to enter as many data as possible to create a workbook.



Each cell has a name, or a **cell address** based on the **column** and **row** it is in. For example, this cell is A2 since it is where column A and row 2 intersect.

You can enter the same data into a number cells at the same time. To do so,

- Select the cells that you want to enter the same data into. Note that these cells need not necessarily be adjacent to one another.
- Type the data you want to appear in the cells
- Press Ctrl+ Enter keys and all selected cells will have the same data entered.

To Edit or Delete Text:

As you enter data into cells, you are likely to make a mistake that may require that you either have to delete an entire cell entry or you may have to edit it. Whatever the case may be you can use either of the following steps after you have selected the required cell to edit content:

- Press the **Backspace** or the delete key on your keyboard to delete text and retype the correct text. Note that pressing either of these keys deletes the entire content of the active cell.
- Press F2 (Edit) key and then make the necessary changes that you want to make.

You can also make changes to and delete text from the **formula bar**. Just select the cell and place your insertion point in the formula bar.

Moving Between Workbooks

When you open an Excel file from disk, you open a workbook that contains multiple sheets. You can have multiple workbooks opened, each in its own document window. At any time only one of the workbooks is active. You can only work directly with the active workbook. You need to activate a workbook that is bringing to the top the workbook in which you want to work.

To activate an open workbook, click the name of the required workbook displayed with the windows **taskbar** (across the bottom of the screen)

To switch between workbooks with a shortcut key, Press **Ctrl+F6** and cycle between all open workbook documents.

Selecting and Moving Between Sheets

To move forward or backward through sheets using the keyboard, use these shortcut keys.

Ctrl + PgUp ⟶ Activate previous sheet

Ctrl + PgDn ⟶ Activate next sheet

To move to a worksheet within a workbook when using a mouse, follow these steps;

1. Click the tab scrolling buttons to scroll through the workbook until you can see the name of the worksheet in which you want to work.
2. Click the tab containing the name of the worksheet you want to activate.

Selecting Multiple Worksheets

To select multiple adjacent worksheets, follow these steps;

1. Select first sheet.
2. Hold down Shift key and select last sheet by clicking the worksheet name.

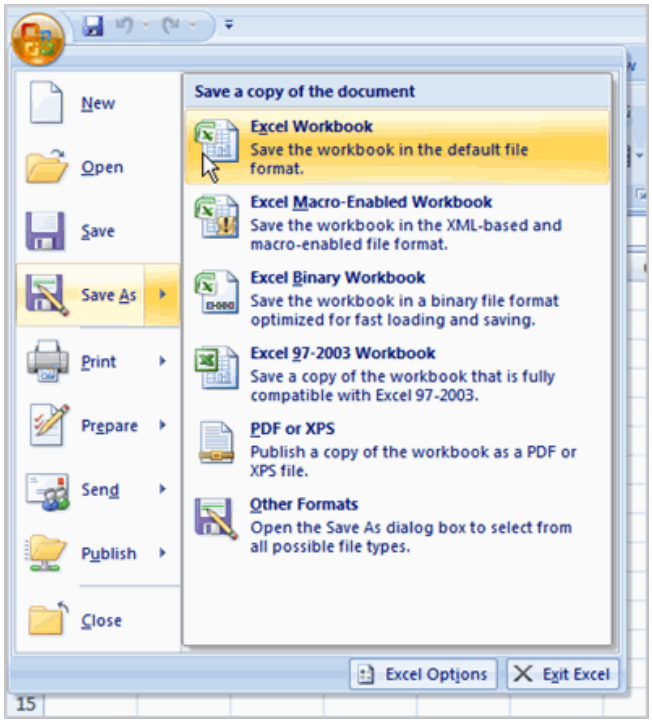
To select multiple non-adjacent worksheets, follow these steps;

1. Select first sheet.
2. Hold down Ctrl key and select next sheet.
3. Continue until all sheets have been selected

Saving a New Workbook

After you have created a workbook, it is only temporal on the screen and may be lost if you quit or exit excel without saving or if there is power interruption to your computer. You may therefore have to save your work if you will need it in future. The required steps for saving a new workbook is as follows:

- Click the **Microsoft Office Button**.
- Select **Save** or **Save As**.
    - **Save As** allows you to name the file and also choose a location to save the spreadsheet. Choose **Save As** if you are saving the file for the **first** time or if you'd like to save the file under a different name. The save as dialog box is as shown below.
    - Select **Save** if the file has already been named.



You can save a workbook in many ways, but the two most common are as an **Excel Workbook**, which saves it with Excel 2007 file extension (.xlsx), and as an **Excel 97-2003 Workbook**, which saves the file in a compatible format so people who have earlier versions of Excel can open the file.

Selecting Cells, Ranges, Row and Columns.

Before you can enter, edit, or modify the content of a cell, you must select the cell or cells you want to change. The single cell that receives the data or formula you enter is the ***active cell***. A selection of multiple cells is referred to as a ***range***. Commands affect all selected cells; data and formula are entered in the active cell.

Selecting A Single Cell.

Using the mouse, move the mouse pointer over the cell and click the left mouse button. Using the keyboard, press the appropriate keys to move the active cell.

The following table shows the keys that move the active cell.

Key	Movement
↑	Moves the active cell up one cell.
↓	Moves the active cell down one cell.
→	Moves the active cell right one cell.
←	Moves the active cell left one cell.
Tab	Moves the active cell up in the selected range.
Ctrl + Arrow	Moves the active cell in the direction indicated until the edge of a block of data is reached.
Home	Moves the active cell to column A of the current row.
Ctrl + Home	Moves the active cell to the first cell in the worksheet (A1).
Ctrl + End	Moves the active cell to the last cell in the used portion of the worksheet.
PgUp	Moves the active cell up one full window.
PgDn	Moves the active cell down one full window.
Alt + PgUP	Moves the active cell one screen left.
Alt + PgDn	Moves the active cell one screen right.

To move to the edge of a block of cell, double-click the side of a cell in the direction you want to move. If the current cell is full, the active cell moves to the edge of the full area on the side you double-clicked. If the current cell is empty, the active cell moves to the first blank cell at the edge of the next full cell in the direction you click. Remember that pressing shift as you move using any of the above techniques will select the cells you move across.

Selecting Rows or Columns

It is possible to select entire rows and/or columns. Using the mouse, click the row number or column letter(s). Drag across adjacent row numbers or column letters to select them, or click the first and shift-click the last.

To select multiple non-adjacent rows and columns, hold down the Ctrl key as you click each heading. To select rows or columns containing the active cell with the keyboard, use the following shortcut keys.

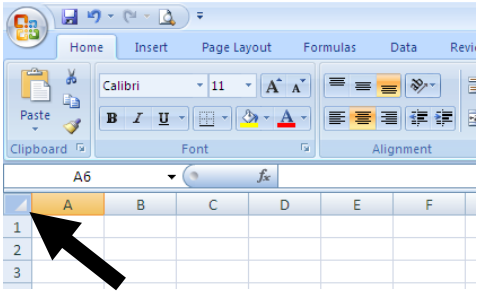
Shift + Space bar ⟶ selects the row.

Ctrl + space bar ⟶ selects the column.

After you select a row or column, you can select additional adjacent rows or columns by holding down shift as you press the arrow key.

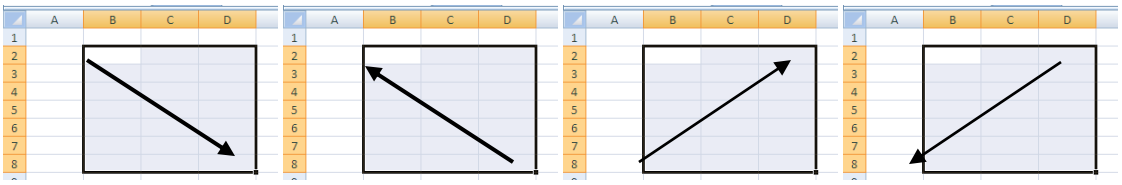
Selecting Entire Worksheet

Just as you can select an entire row or column, it is also possible to select an entire worksheet. To do so simply click the intersection of the columns and the row referencing numbers at the top left of your screen as shown in the figure below:



DEFINING A RANGE AND ITS ADDRESS

We have so far look at the cell address of a single cell. Whenever we want to work on a group of cells, we need to define these cells. Remember a group of cells is known as a range. We now want to look at how we can specify an address for a group of cells as a single unit. To define a contiguous range, two cell addresses are required and these must be separated by : (colon). The following figures throw more light on the four possibilities but for this course we will be using the first or the second figure.

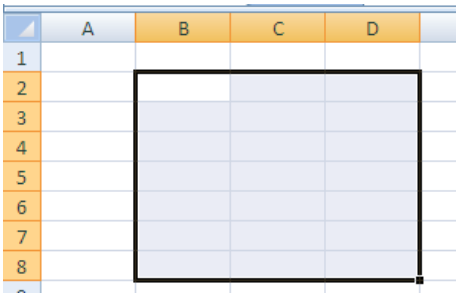


The base of the arrow defines the starting cell while the tip defines the end cell. Recall that defining a range address requires two diagonal cells. For simplicity we will use the

first two whenever a range is referenced even though either of the four can be used to refer to the same range.

For a range involving a single cell, the top left and the bottom right cell addresses would be the same. For a range involving a single row or a single column, the address of top left cell is the address of the first cell in the row or column while that of the bottom right cell is the cell address of the cell in the last row or column of the required region respectively. The addresses of the top left cell and that of the bottom right cell must be separated by a colon. The colon is read as TO. Hence the range A1:B6 is interpreted as the cell A1 to cell B6, that is the range consisting of the first six rows of columns A and B (i.e. A1, A2, A3, A4, A5, A6, B1, B2, B3, B4, B5 and B6).

Consider the figure below



In defining the address of the above range, any of the following is correct

B2:D8 D8:B2 D2:B8 B8:D2

For ranges that are not contiguous, the cell or range addresses are separated by commas. For example the following formulas contain valid range addressees:

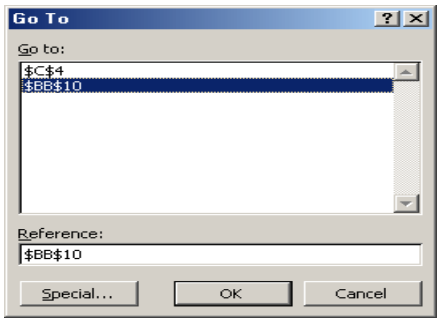
=sum(a1:b3,c3:d8)

=sum(a1,b2,c3,d4:d8)

Using The Go To Command To Move Or Select

The **Go To** command moves the active cell to any address you want. It is actually the fastest way of moving from one cell to another if the two cells concerned are very far apart. To use the **Go To** command, follow these steps;

1. Press F5 to display the Go To dialog box.



2. In the Reference text box, type the address or range you want to go to, or select from the list box the named location you want.
3. Choose OK or press Enter.

To select a large range, select the opposite corner by using F5 again, and entering the opposite cell address. Hold down shift before choosing OK.

To go to a named location on the active worksheet when you are using a mouse, follow these steps;

1. Click the down-arrow to the right of the reference area to display a list of named ranges (they appear in alphabetic order).
2. Click name of range you want to go to.

* Pressing F8 (Extend mode) is like holding down shift key.

MORE ON ENTERING AND EDITING DATA

Excel worksheet cells can contain values or formulas. The constant values that cells can contain are numbers, text, dates, times, logical values such as TRUE or FALSE, and errors. Error values such as #Num!, occurs when Excel cannot properly evaluate a formula in a cell.

When you type a value or formula in the active cell, your entry appears at the insertion point, or cursor in the long text box on the right of the formula bar near the top of the screen. You can ether edit the contents of a cell directly in the cell or you can also edit

the contents of a cell in the formular bar. Generally when you are in editing mode, many of the Ribbon commands will be inactive, and you will not be able to use them.

To place the contents of a cell in direct editing mode, do one of the following:

- Double-click the cell that contains the data that you want to edit.
- Click the cell that contains the data that you want to edit, and then click anywhere in the formula bar. This positions the insertion point in the cell or formula bar. You can move the insertion point to the end of the cell contents by clicking the cell and then press F2.

To edit the cell contents, do any one of the following:

- To delete character(s), click where you want to delete them, and then press BACKSPACE, or select them, and then press DELETE.
- To insert characters, click where you want to insert them, and then type the new characters.

You can replace specific characters by selecting them and then typing the new characters. You can also turn on the overtype mode so that existing characters are replaced by new characters while you type by pressing the insert key.

You can start a new line of text at a specific point in a cell by first clicking where you want to break the line, and then press ALT+ENTER.

To enter your changes, press ENTER but before you press you can cancel any changes that you made by pressing ESC. After pressing the ENTER, you can cancel any changes made by clicking the Undo on the Quick Access Toolbar.

It must be noted that a cell may display ##### when it contains data that has a number format and that is wider than the column width. To see all text, you must increase the width of the column.

In summary, the steps for editing are as follows:

Editing in the formula bar

To edit in the formula bar, follow these steps;

1. Select cell.
2. Position pointer in text and click OR press F2 after selecting and then move insertion point by pressing left or right arrow keys.
3. Then edit formula.

Editing directly in a cell

To edit directly in a cell, follow these steps;

1. Double-click the cell.
2. Using arrow keys move insertion point to required positions.
3. Make necessary changes.
4. Press Enter to enter (or paste) information or press Esc to leave the contents unchanged.

Entering Text and Numbers

You can type as many as 255 characters in a cell. If a cell is not wide enough, all characters may not be displayed if the cell to the right contains data. With the General format, the text automatically aligns on the left side of the cell.

You can make Excel accept a number as text by typing an apostrophe (‘) followed by the number e.g. ‘25,000. You may also enter numbers as text by placing an equal sign in front of the number and enclosing the number in quotation marks e.g. = “25,000”. In order to display a number that exceeds the cell width, it may be necessary to have the number displayed as text else the cell will be filled with # signs or in some cases may be displayed in scientific notation. E.g. 2.17E+09. Note, however, that you may not perform any arithmetic operation with text values.

Numbers are constant values containing only the following characters:

1 2 3 4 5 6 7 8 9 0 - + / . E e

When a number is entered, Excel stores both the number typed into a cell and the format (or appearance) in which the number should be displayed (i.e. the format). Initially Excel

tries to establish how the number should be formatted. Apart from the digits 0 to 9, none of the other characters can appear more than once in a given number. For example 2.4e4e2 and 2.3.3 are invalid numbers and Excel treat them as text and cannot therefore be used in computations.

To enter a fraction such as 7½, type the integer 7, a space, and then the fraction (7 ½). To type ½, type a zero, a space, and the fraction (0 1/2); else Excel will interpret the entry as a date.

Entering Dates and Times

Excel recognizes dates and times typed in most common ways. When you type a date or time, Excel converts your entry to a serial number. This enables Excel to do date and time calculations. For a date, the serial number represents the number of days from the beginning of the 20th century (i.e. 1/1/1900) until the date you type. For example, the date 1/1/1902 is represented as 732 and that is the number of days since 1/1/1900. Time is displayed as a decimal fraction of a 24-hour day. Correctly entered dates appear in the formula bar with the format m/d/yyyy, regardless of how the cell is formatted.

- To format a date in the default date format, select the cell containing the date and press Ctrl + #
- To format a time in the default format press Ctrl+ @
- To quickly enter the current data in a cell press Ctrl+**;**
- To quickly enter the current time in a cell press Ctrl+**:**

A valid date entry in an unformatted cell is aligned, as a number, to the right. If the cell has been previously formatted with a numeric format, it appears as a serial number.

To enter a date, type the date into the cell with any of these formats.

Format	Example
m/d/yy	7/8/97
dd/mm/yy	07/08/97
d-mmm-yy	8-July-97
m/d/yy h:mm	6/8/97 09:45
mmm-yy	July – 97
mmmm d, yyyy	July 8, 1997

Times may be entered in the following formats.

Format	Example
h:mm	13:32
h:mm:ss	13:32:45
h:mm AM/PM	1:32PM
h:mm:ss AM/PM	1:32:45PM
m/d/yy h:mm	6/8/97 13:32
mm:ss	45:15
[h]:mm:ss	21:45:15

If you use a 12-hour clock follow the time with a space and A, AM, P or PM (in Upper or lower case).

Using Auto Complete

To make it easy to enter repeated text items in a column, Excel includes a new feature called Auto complete. Instead of typing the same text items over and over, you only need to type it once. The next time you want to type the same text in or at the bottom of the column, you can type the first few letters of the entry. Excel will complete the rest of the entry. You can simply press Enter to make the entry. If you want to type a different text item, just continue typing.

Clearing, Inserting, or Deleting in a Worksheet

Shortcut Keys for changing the Worksheet layout.

Keys	Action
Del	Clears selected formula; same as the **Edit, Clear, Contents** command.
Backspace	Clears the formula bar; activates and clears the formula bar.
Ctrl + C	Copies the selection so that it can be posted; same as the **Edit, Copy** command.
Ctrl + X	Cuts the selection so it can be pasted; same as the **Edit, Cut** command.
Ctrl + V	Paste at the selected cell; same as the **Edit, Paste** command.
Ctrl + Z	Undoes last command.

To erase the contents of a cell, refrain from typing a space to replace the original contents. This could lead to problems later. Rather use **Edit, Clear** command (not **Edit, Delete** – This will remove the entire cell from the worksheet).

You may also press Del Key after selecting the cell to delete the contents of a cell – only the contents are deleted not the notes attached or Formats. Using **Edit, Clear** command, you have the option to indicate whether all cell contents and notes should be cleared and returned to General format, or Clear contents but does not change formats or notes, or clear comments but does not change content or formats.

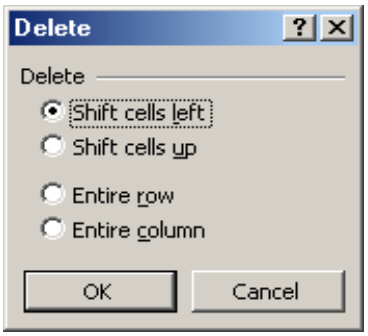
Deleting Cells, Rows, and Columns

When the **Edit, Delete** command deletes cells, it completely removes the selected cells and slides in other cells to fill the gap. You can choose the direction in which the remaining cells move.

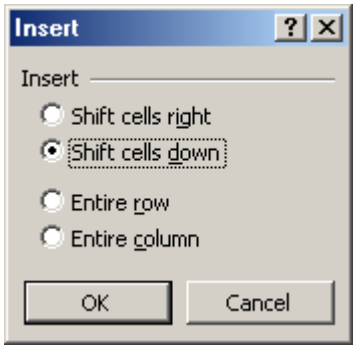
To remove cells, rows, or columns, perform the following steps.

1. Select the cell, range, cells in the rows or columns to be deleted.

2. Either (i) press Ctrl+- (minus), (ii) click the rights mouse button and select Delete or (iii) Click at the home button, select delete from the cells group and then select the appropriate option.
3. The Delete dialog box appears as shows below. Simply select the appropriate option, that is either to shift cells left, shift cells up, delete entire row or column on what was selected in step (1).



The Delete Dialog Box



The Insert Dialog Box

If you selected a whole row or column, the dialogue box does not appear.

4. click OK.

Inserting Cells, Rows, or Columns

To insert cells, rows or columns, perform the following steps;

1. Select a cell or range of cells where you need new cells inserted. Or, select cells in the rows or columns where you want to insert new rows or columns.
2. Either (i) press Ctrl+ + (plus), (ii) click the rights mouse button and select Insert or (iii) Click at the home button, select Insert from the cells group.
3. The Insert dialog box appears as shows above. Select the appropriate option from the Insert box and click OK.

INCREASING DATA-ENTRY EFFICIENCY

Filling data automatically in worksheet cells

You can normally enter data faster by making Excel to automatically repeat data or fill data automatically.

Automatically repeat items already entered in the column

If the first few characters that you type in a cell match an existing entry in that column, Excel automatically enters the remaining characters for you. Excel automatically completes only those entries that contain text or a combination of text and numbers and not dates and times. Entries that contain only numbers, dates, or times are not automatically completed.

To automatically repeat items, either of the following can be used:

(i) To accept a proposed entry, press ENTER.

The completed entry exactly matches the pattern of uppercase and lowercase letters of the existing entry.

(ii) To replace the automatically entered characters, continue typing the required text.

(iii) To delete the automatically entered characters, press BACKSPACE.

If you do not want entries that you type to be completed automatically, you can turn this option of by the following steps.

(i) Click the **Microsoft Office Button** , and then click **Excel Options**.

(ii) Click **Advanced**, and then under **Editing options**, clear or select the **Enable AutoComplete for cell values** check box to turn automatic completion of cell values on or off.

(iii) Excel then completes an entry only when the insertion point is at the end of the current cell contents.

(iv) Excel bases the list of potential AutoComplete entries on the column that contains the active cell. If entries are repeated within a row they are not automatically completed.

Using the fill handle to fill data

You can use the **Fill handle** command to fill data into worksheet cells. It is also possible to have Excel automatically continue a series of numbers, number and text combinations, dates, or time periods, based on a detected pattern. However, to quickly fill in several types of data series, you can select cells and drag the fill handle .

The fill handle is displayed by default, but you can hide it using the following steps.

(i) Click the **Microsoft Office Button** , and then click **Excel Options**.

(ii) Click **Advanced**, and then under the **Editing options**, clear or select the **Enable Fill handle and cell drag-and-drop** check box to hide or display the fill handle.

(iii) To avoid replacing existing data when you drag the fill handle, make sure that the **Alert before overwriting cells** check box is selected. If you do not check the **Alert before overwriting cells** you will normally receive a message warning you of overwriting nonblank cells.

After you drag the fill handle, the **Auto Fill Options** button appears so that you can choose how the selection is filled. For example, you can choose to fill just cell formats by clicking **Fill Formatting Only**, or you can choose to fill just the contents of a cell by clicking **Fill Without Formatting**.

If you don't want to display the **Auto Fill Options** button every time you drag the fill handle, you can turn it off by following these steps.

(i) Click the **Microsoft Office Button** , and then click **Excel Options**.

(ii) Click **Advanced**, and then under the **Cut, Copy, and Paste**, clear the **Show Paste Options buttons** check box.

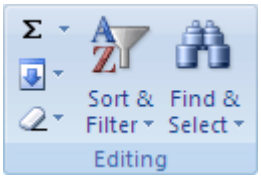
Filling data into adjacent cells

You can use the **Fill** command to fill the active cell or a selected range of cells with the contents of an adjacent cell or range of cells, or you can quickly fill adjacent cells by dragging the fill handle .

Filling the active cell with the contents of an adjacent cell

(i) Select an empty cell either below, to the right, above, or to the left of the cell that contains the data that you want to fill in that cell.

(ii) On the **Home** tab, in the **Editing** group, click **Fill** (arrow pointing downwards), and then click **Down**, **Right**, **Up**, or **Left** depending on the direction you will want to fill.



You can also quickly fill a cell with the contents of the cell above or to the left of it by using CTRL+D or CTRL+R respectively.

Dragging the fill handle to fill data into adjacent cells

(i) Select the cells that contain the data that you want to fill into adjacent cells.

(ii) Drag the fill handle across the cells that you want to fill.

(iii)To choose how you want to fill the selection, click **Auto Fill Options** , and then click the option that you want.

If you drag the fill handle up or to the left of a selection and stop in the selected cells without going past the first column or the top row in the selection, Excel deletes all data within the selection. This means that you are to ensure that you drag the fill handle out of the selected area before releasing the mouse button.

Filling formulas into adjacent cells

(i) Select the cell that contains the formula that you want to fill into adjacent cells.

(ii) Drag the fill handle across the cells that you want to fill.

(iii)To choose how you want to fill the selection, click **Auto Fill Options** , and then click the option that you want.

Similarly, you can also fill the active cell with the formula of an adjacent cell by using the **Fill** command on the **Home** tab in the **Editing** group or by pressing the CTRL+D or CTRL+R to fill a cell below or to the right of the cell containing the formula.

You can automatically fill a formula downward, for all adjacent cells that it applies to, by double-clicking the fill handle of the first cell that contains the formula. If for example you have numbers in cells A10:A25 and B10:B25, and you type the formula

=A10+B10 into cell C10, you can copy the formula in C10 into cells C11:C25 by selecting cell C10 and double-clicking the fill handle.

Filling in a series

(numbers, dates, or other built-in series items)

It is also possible to use the fill handle to quickly fill cells in a range with a series of numbers or dates or with a built-in series for days, weekdays, months, or years. To do so, you will have to

(i) Select the first cell in the range that you want to fill.

(ii) Type the starting value for the series.

(iii) Type a value in the next cell to define a pattern.

For example, if you want the series 2, 4, 6, 8, 10,…. type **2** and **4** in the first two cells and if you want the series 2, 2, 2, 2..., you can leave the second cell blank.

Initial selection	Extended series
0,1, 2, 3	4, 5, 6,...
10:00	11:00, 12:00, 13:00,...
Mon	Tue, Wed, Thu,...
Monday	Tuesday, Wednesday, Thursday,...
Jan	Feb, Mar, Apr,...
Jan, Mar	May, Jul, Aug, Oct,...
Jan-99, Mar-99	May-99, Jul-99, Aug-00, Oct-99,...
15-Jan, 20-Mar	23-May, 26-Jul, 28-Sep, 01-Dec,...
1st Period	2nd Period, 3rd Period,...
Product 1	Product 2, Product 3,...

(iv) Select the cell or cells that contain the starting values.

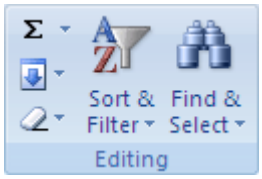
(v) Drag the fill handle across the range that you want to fill.

To fill in increasing order, drag down or to the right. To fill in decreasing order, drag up or to the left.

It is also possible to specify the type of series by using the right mouse button to drag the fill handle over the range and then clicking the appropriate command on the shortcut menu. For example, if the starting value is the date Jan-2000, click **Fill Months** for the series Feb-2000, Mar-2000, and so on; or click **Fill Years** for the series Jan-2003, Jan-2004, and so on.

If the selection contains numbers, you can control the type of series that you want to create.

(i) On the **Home** tab, in the **Editing** group, click **Fill**, and then click **Series**.



(ii) Under **Type**, click one of the following options:

- Click **Linear** for a series that is calculated by adding the value in the **Step value** box to each cell value in turn.
- Click **Growth** for a series that is calculated by multiplying the value in the **Step value** box by each cell value in turn.
- Click **Date** for a series that fills date values incrementally by the value in the **Step value** box and dependent on the unit specified under **Date unit**.
- Click **AutoFill** for a series that produces the same results as dragging the fill handle.

(v) You can suppress **AutoFill** by holding down CTRL while you drag the fill handle of a selection of two or more cells. The selected values are then copied to the adjacent cells, and Excel does not extend a series.

Filling data by using a custom fill series

You can make the entering of a particular sequence of data easier by creating a custom fill series. A custom fill series can be based on a list of existing items on a worksheet, or you can type the required list. You should take note that a custom list can only contain text or text mixed with numbers. For a custom list that contains numbers only, such as 0 through 100, you must first create a list of numbers that is formatted as text.

Using a custom fill series based on an existing list of items

(i) Select the list of items that you want to use in the fill series.

(ii) Click the **Microsoft Office Button** , and then click **Excel Options**.

(iii) Click **Popular**, and then under the **Top options for working with Excel**, click the **Edit Custom Lists**.

(iv) Ensure that the cell reference of the list of items selected is displayed in the **Import list from cells** box, and then click **Import**.

The items in the selected list will be added to the **Custom lists** box.

(v) Click **OK** twice.

(vi) Click a cell, and then type the item in the custom fill series that you want to use to start the list.

(vii) Drag the fill handle across the cells that you want to fill.

Using a custom fill series based on a new list of items

(i) Click the **Microsoft Office Button** , and then click **Excel Options**.

(ii) Click the **Popular**, and then under the **Top options for working with Excel**, click the **Edit Custom Lists**.

(iii) In the **Custom lists** box, click **NEW LIST**, and then type the entries in the **List entries** box, beginning with the first entry.

Press ENTER after each entry.

(iv) When the list is complete, click **Add**, and then click **OK** twice.

(v) Click a cell, and then type the item in the custom fill series that you want to use to start the list.

(vi) Drag the fill handle across the cells that you want to fill.

Editing or deleting a custom fill series

(i) Click the **Microsoft Office Button** , and then click **Excel Options**.

(ii) Click the **Popular** category, and then under the **Top options for working with Excel**, click the **Edit Custom Lists**.

(iii) In the **Custom lists** box, select the list that you want to edit or delete, and then do one of the following:

- To edit the fill series, make the changes that you want in the **List entries** box, and then click **Add**.
- To delete the fill series, click **Delete**.

CHAPTER TWO

FORMULAS

Formulas are the core of an Excel worksheet. A formula may be defined as any data that does not place itself in a cell but rather the result that it generates. It may generate either a value or a label. Formulas are used to do all the calculations that we use to do by hand or with calculators. Without formulas, there would be no point to using an electronic worksheet such as Excel.

Formulas may be used to do simple calculations involving addition, subtraction, multiplication and division, as well as to carry out very complex financial, statistical or scientific calculations.

When a formula is entered in a worksheet cell, the result of the formula usually appears on the worksheet. To view the formula that produces the results, select the cell and the formula appears in the formula bar. If you wish to view the formula in-cell, double-click the cell or select the cell and press F2.

A formula in Excel….

1. Must start with either of the following symbols = , + or -. Note that starting a formula with the minus sign cause the value of the address or the constant that the minus sign precedes to be negated. For example, -B3+B4 is a valid formula. If B3 and B4 contain 10 and 15 respectively then the above formula will give 5 as the result of the current cell.

2. Allows the use of mathematical operators such as + (addition), - (subtraction) , * (multiplication) and ^ (exponentiation), etc

3. Allows the use of relational operators such as >, <, >=, etc

4. Can be a valid mathematical expression or built-in function. E.g. COS(20).

Generally, formulas in Excel always begin with an equal sign (=) and can include numeric and text values (constants) arithmetic operators, text operators, functions, parentheses, cell references, and names.

ENTERING FORMULAS

To enter a formula in a worksheet, make the cell in which you want to insert the formula active. This cell should be empty else you will loose whatever information you have in the active cell after you have entered the formula. When keyed in, the formula displays in the cell as well as in the formula bar. When you exit the cell after completing the formula, the result of the formula displays in the active cell while the actual formula displays in the formula bar.

Formulas make reference to (or include) the contents of a cell by the cell's reference, such as C4. Formulas may use operators such as + or – and also built in formulas, called functions, like SUM() or SQRT(). A simple formula such as =C4 * D8 in the formula bar multiplies the contents of cell C4 by the contents of cell D8.

One of the advantages of using formulas in a worksheet is that cell entries can be changed and the formula will automatically recalculate the values and insert the result in the cell containing the formula.

CELL REFERENCING

Cell references, also called addresses, are used in a formula to refer to the contents of a cell or a group of cell. Cell references allow you to use values from different parts of a worksheet and execute a desired calculation.

A cell is always referred to by using the row and column heading. For example, the cell at the intersection of column B and row 10 has the cell reference B10. The cell reference of the active cell is displayed in the name box at the left of the formula bar.

Entering Cell References by Pointing

The least error prone method of entering cell references in a formula is by pointing to the cell you want to include in a formula.

To enter a cell reference into a formula by pointing, follow these steps;

1. Select the cell for the formula.
2. Type an equal sign (=) or click the Edit Formula button.
3. Point to the cell you want in formula and click.

This inserts a moving border (dashed marquee) around the cell and also changes the mode from Enter to Point.

The address of the cell you point to appears at the cursor location in the formula bar.

You also can enter ranges into formula by dragging across the range.

4. Enter an operator and point to the next cell or range.
5. When you have finished entering the formula, click the Enter box or press Enter to enter the formula.

Relative, Absolute and Mixed References

A reference identifies a cell or a range of cells in a worksheet. There are basically three main types of addressing namely ABSOLUTE, RELATIVE and MIXED addressing. There is also a fourth type CIRCULAR ADDRESSING which is not permitted in Excel although its use would not force Lotus to signal an error. Excel treats cell references in formulas differently when they are copied from one cell to another and hence the need to have a good understanding of the different addressing. Relative cell references refer to cells relative to a position in a formula. Absolute references refer to cells in a specific location. A relative cell reference adjusts when a formula is copied while an absolute cell reference remains constant when a formula is copied. A mixed cell reference does both – either the column remains absolute and the row is relative or the column is relative and the row is absolute. An absolute reference has the dollar sign before the column and/or row cell reference while a relative reference has none.

Relative References – This is a cell or range address in a formula that Excel interprets by virtue of its location relative to the cell that contains the formula. When a formula containing relative addresses are copied from one cell to another, Excel copies the relationship between the cells/ranges in the formula in terms of their positions relative to the cell that holds the result, and then adjust the cell addresses in the copied formula such that the relationship is maintained. Unless you specify otherwise, Excel uses relative referencing for cell addresses when you enter a formula. This means that cell references in a formula change after you fill a range with a formula. Example, let the cell B5 contains the formula =(+B4-B3)/B2 Excel interprets this formula as follows:

Subtract the entry at the cell two rows above the current cell (i.e. B5 to B3) from that of the row one above the current cell (i.e. B5 to B4) and divide the result by the entry in the cell three rows above the current cell (i.e. B5 to B2) and store the final result in the current cell (B5).

Therefore copying the content of cell B5 irrespective of the value stored, to cells say E6 to Z6 only copies the relationship as given above hence when the cell pointer is placed at cell Z6 for example, the formula would be shown as (+Z5-Z4)/Z3 in the formular bar.

Also, if you enter the formula = SUM (B4:D4) in cell F4 and then copy it relatively to cell F5, the formula in cell F5 displays as = SUM (B5:D5).

Again if the formula = SUM (B5:D5) in cell F5 is copied to cell F10, it changes to = SUM (B10:D10).

Notice how the formula changes to give the cell reference the same relative position from the cell that contains the formula.

Usually one wants cell references to change when copied. Occasionally, however, these changes cause problems. For example if all the formulas copied above have to be multiplied by a value in cell A4, then the formula = SUM (B4:D4) *A4 in cell F4 will

change to = SUM (B5:D5) *A5 when copied to cell F5. To maintain reference A4 even when copied we need to use Absolute referencing.

Absolute Referencing – As mentioned above, by default Excel treats all formulas to contain relative addresses unless either the column letter, row number or both in a cell address is/are preceded by a dollar sign. Absolute addresses are identified by having a dollar sign preceding a column letter and a row number of a cell address. Absolute addressing is used to express permanent link to the values of columns and/or rows. A permanent link means should the content of a cell with a formula containing absolute addresses be copied, the absolute cell addresses in the formula should not be updated to reflect the new column and/or row. E.g. $A$5 indicates a permanent link to the cell A5 (i.e. a permanent link to Column A row 5 or to cell A5).
Example, if cell F4 contains the formula =SUM (B4:D4) * $D$4 and if we copy the formula to cell F5 we will obtain =SUM (B5:D5) * $D$4.

You enter an absolute reference by typing the dollar sign in front of the row or column that you want to remain the same or by pressing the F4 key when the flashing insertion point in the formula bar has been placed at where the cell reference is to be made absolute. Each time F4 is pressed, the type of reference changes, from eg. A10 to $A$10 → A$10 → $A10 → A10.

Mixed References **-** On some occasions you want only the row to stay fixed or only the column to stay fixed when copied. In this case we use mixed referencing. Mixed addressing combines relative and absolute addressing, that is either the column or the row number is preceded by a dollar sign. Thus, $G5 or G$5 is a mixed addressing. The former implies column is linked permanently to Column G whiles the row is relative to row 5 and the latter also implies that the row is linked permanently to row 5 while the column is relative to column G. Therefore, when a formula containing a mixed address is copied from one cell to another all the absolute addresses would remain the same while the relative part would be updated.

For example the formula = $A4 * B$3 has two mixed references. $A4 has an absolute column and a relative row while B$3 has a relative column and an absolute row. Mixed cell references allow you to fill in column and row data using only one formula.

Circular references – Circular addressing involves the use of the current cell's address in the formula for the current cell either directly or indirectly. That is defining a formula for the current cell by including the address of the current cell in the formula or simply put defining a cell in terms of itself. An example is =(+B4-B3)/B2 when the current cell is either B2, B3 or B4. For example if the content of cell D3 is (D1+D2-D3)/3, then the result of the formula in D3 will keep on changing whenever data is stored in a cell. This situation may be useful at times but unless it is intended, try and avoid circular referencing. With higher versions of Excel such as Excel 2003, Excel will display the figure 2 when circular reference is used. If you click on cancel, excel will store zero (0) in the current cell and the value will not be changing. However, if you click on OK, Excel allows you to define the maximum number of iterations together with some information and once done a number is displayed in the current and will continue to change by a certain factor whenever data is entered into any of the cells.

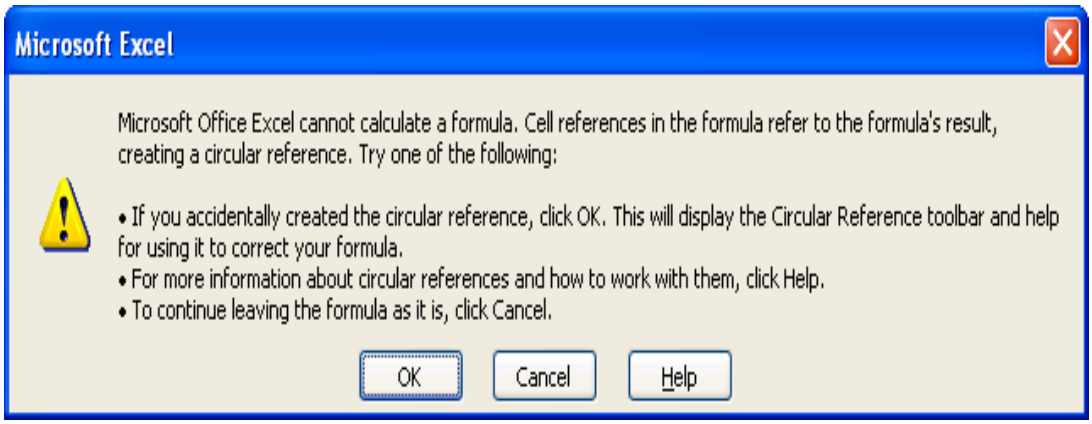


Figure 2: Circular reference message generated by Excel 2003

Referring To Other Sheets In A Workbook

By including a sheet reference as well as a cell reference, you can refer to other sheets in a workbook. For example, to refer to cell A10 on sheet 5, you need to enter Sheet5!A10

in the formula. If the sheet is named, e.g. as CompSc1, simply use CompSc1! A10. If the sheet name includes spaces, you must surround the sheet reference with single quotation marks. For example if the sheet is named Comp Sc1, then the correct reference is 'Comp Sc1'!A10.

3-D References

You can use 3-D references to refer to a cell range that includes two or more sheets in a workbook. A 3-D reference consists of a sheet range specifying the beginning and ending referred to.

For example, =SUM(Sheet1:Sheet4!$D$1:$D$10)

SUMS up the values in the range of cells $D$1:$D$10 in each of the sheets from sheet1 to sheet4 and adds the SUMS together resulting in a grand total.

OPERATORS IN FORMULA

Operators tell formula what operations to perform. Excel uses **four different types of calculation operators: arithmetic, comparison, text concatenation, and reference**. These are as follows:

Arithmetic operators

These are operators used in performing basic mathematical operations such as addition, subtraction, or multiplication, division, etc to produce numeric results. The following are the operators that can be used in a mathematical expressions.

Arithmetic operator	Meaning	Example
+ (plus sign)	Addition	A2+3
– (minus sign)	Subtraction Negation	C3–A3 –B4
* (asterisk)	Multiplication	A4*8

/ (forward slash)	Division	B4/B3
% (percent sign)	Percent	95%
^ (caret)	Exponentiation)	4^3 (which gives 64)

Comparison operators

These are operators that make it possible for you to compare two values. When two values are compared, the result is a logical value and that can be either True or False. The comparison operators are as follows

Comparison operator	Meaning	Example
= (equal sign)	Equal to	A3=C4
> (greater than sign)	Greater than	A4>C5
< (less than sign)	Less than	A4<B8
>= (greater than or equal to sign)	Greater than or equal to	A3>=B4
<= (less than or equal to sign)	Less than or equal to	A4<=C1
<> (not equal to sign)	Not equal to	A4<>

Text concatenation operator

There is only one text concatenation operators and this is the ampersand (&) sign which is used to join, or concatenate, one or more text strings to produce a single piece of text.

Text operator	Meaning	Example
& (ampersand)	concatenates, two texts to produce one single text result	"CSM"&"183"

Reference operators

These operators make it possible to combine, cells or range of cells for calculations. The three reference operators are as follows

Reference operator	Meaning	Example
: (colon)	Range operator, which literally means "TO" is used to produce one reference to all the cells between two cell addresses references, including the two references	A10:G40
, (comma)	Union operator, which literally means "and" is used to combine multiple references into one reference.	Max(B15,B19:G15)
(space)	Intersection operator, produces one reference to cells that are common to two references. If no cells are common to both references, then #NULL is returned as result.	C10:D17 C6:C18

Order Of Evaluation

If there are two or more operators in a formula, Excel uses the same order of operation used in algebra. From left to right in a formula, this order, called the order of operation or order of precedence is negation (-) first, then percent (%), then exponential (^), followed by multiplications (*), division (/), addition (+), and finally subtraction (-). To change the order of operation (or evaluation), use parenthesis around the part of the formula you want calculated first.

	Formula	Result
E.g.	= 6 + 27/3	15
	=(6 + 27)/3	11

The table below shows the order in which Excel evaluates operators.

Operator precedence

If you use a number of operators in a single formula, Excel performs the operations in the order shown in the following table. As such, in a single formula where the exponentiation

and multiplication are used, the exponentiation will be evaluated first. If a formula contains operators with the same precedence such as multiplication and division, Excel evaluates the operators from left to right.

Operator	Description
: (colon) (single space) , (comma)	Reference operators
–	Negation (as in –1)
%	Percent
^	Exponentiation
* and /	Multiplication and division
+ and –	Addition and subtraction
&	Connects two strings of text (concatenation)
= < > <= >= <>	Comparison

RULES GOVERNING THE EVALUATION OF THE OPERATORS

There are basically three rules concerning the evaluation of the arithmetic operators in any mathematical expression or formula. These rules are as follows:

1. For any two operators with different precedence in the same formula, the operator with the higher precedence would be evaluated first. Take for example the expression =**8 / 2 ^ 3**. The operator, ^ would be evaluated first, that is 2^3 and hence the above expression would give the result 1 instead of 64 as you may have thought.

2. For any two operators of the same precedence, the order of evaluation of the operators is from left to right. For instance, in this expression **10 / 5 * 2,** the 10/5 would be evaluated first and the result multiplied by 2. The result of this expression would therefore be 4 instead of 1.

3. Parenthesis can be used to enforce a change in the order of evaluation of the operators. An operator in a bracket for example would be evaluated before another operator of the same precedence but not in a bracket. For example, for **10 / (5 * 2).** The expression in the bracket (5*2) would be evaluated before the result is used as the divisor in dividing the 10. Hence with the use of bracket in the same example as in rule 2, the result of the expression has changed from 4 to 1.

NAMING CELLS AND RANGES

A selected group of cell is referred to as a range. A range of cells can be formatted, moved, copied, or deleted. A cell or range of cell can also be named. A range name may be used anywhere you can use a cell reference. It is easier to understand an expression such as ***Price * Quantity*** rather than ***A1*B1***, and that explains why it is sometimes better to name your ranges.

Rules For Creating Names

- Names must start with a letter or an underscore but any character may be used after the initial letter except a space or a hyphen
- Space is not allowed in a name.
- A maximum of 255 characters are allowed for range name but is advisable to make them as short as possible.
- Names may be typed in either upper – or lowercase letters.

Defining Range Names

Using the Name Box – The name box appears at the left end of the formula bar. The reference area displays the cell reference for the active cell or the name of the currently

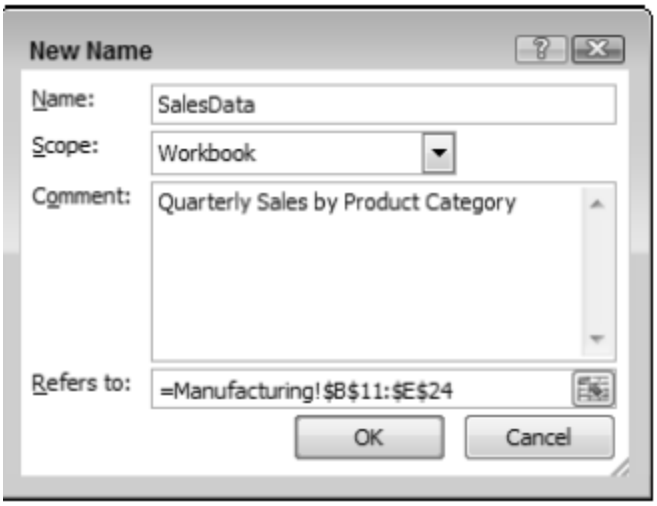
selected cell or cells, if they are named. If you click the arrow to the right of the named box, you display an alphabetical list of all defined names in the workbook. You can select a named cell or range by clicking the arrow and selecting the name from the list.

To define a name using the name box, follow these steps;

1. Select the cell or range of cells to be named.
2. Click the arrow to the right of the named box. The active cell appears in the name box and is highlighted.
3. Type the name for the selected cell or cells.
4. Press Enter.

OR

1. Select the cell or range that you want to name.
2. Click the Formulas tab on the Ribbon and then click the Define Name button (or right-click the range and choose Name a Range from the contextual menu). Excel displays the New Name dialog box, as shown in the Figure below.
3. In the Name text box, type a name (or use the name that Excel proposes, if any).
4. If needed, enter a comment in the Comment box. You can enter a comment, for example, to provide a description and other details of the name for future worksheet auditing purposes.
5. Verify that the address Excel displays in the Refers To text box is correct. To refer to a different address, delete the address and then either type the new cell or range address (with a leading equal sign) or use the mouse pointer to select the cell or range on the worksheet.
6. Click OK.



If you want to create several names in one go, use the Name Manager instead of the Define Name method. Click the Name Manager button in the Formulas tab. In the Name Manager dialog box, click New to add a name. After you finish adding a name, you're returned to the Name Manager dialog box, where you can repeat the process to create additional names.

CHAPTER THREE

FUNCTIONS

Functions and Arguments.

In Excel, the developers included in the package a lot of mathematical and other useful functions that Excel users can use without writing their own definitions. Since these functions have been built into the Excel package, they are referred to as built-in or predefined functions. These functions make the data processing and analysis very easy. Without the use of built-in functions, there wouldn't have been much difference between the use of a calculator and Excel in terms of computations and other processing. A built-in function may be defined as a function that has already been defined by the Excel software developers for their users to use without the need to redefine. For example, to sum the content of the entries in cells A1 to A1000 a user would have to enter the formula

+A1+A2+A3+A4+A5+A6+...+A999+A1000

but the use of the built-in function SUM makes this quite easier by simply entering the formula =SUM(A1:A1000) at the cell where the result is to be placed.

If you want to write an equation to determine a mortgage or loan payment for example, you need the following information;

Argument	Description
rate	interest rate per period
nper	number of periods
pv	present value (starting value of loan)
fv	Future value (ending value of loan)

Because the equation for an amortized loan payment requires many complex terms,

1. You are likely to make typographical errors if you write your own equation.
2. Excel solves a formula you enter more slowly than it solves a built-in function for the same operation.
3. Entering functions take less keystrokes and saves time.

So instead of manually entering a long formula to calculate the loan payment, you can use Excel PMT ( ) worksheet function. You can either type the function into a cell or insert it into a cell with the guidance of the **Insert** Function.

A function operates on what are referred to as arguments. These are values or references for the information needed to do the calculation. Arguments are placed within brackets after the function name separated by commas. An argument may consist of a constant such as 100, a cell reference such as B10:B20 or another function (referred to as a nested function). The PMT function for example, is entered in the form

PMT (***rate, nper, pv***, fv, type)

- Arguments in bold and italic, such as rate, nper, and pv, above are required. Those arguments in italic only are optional.

Functions include two parts. The first part is the name of the function, which always immediately follows the equal sign. The equal sign preceding the function is required for only the first function entered in the cell.

The second part of the function is the argument. The argument contains the data needed by the function to perform the necessary calculations or data manipulation. Most functions contain one or more arguments in parenthesis. If the function contains more than one argument, separate the arguments with commas. Never include a space unless it is included in quotation marks. Some functions can have up to 30 arguments. An ellipsis (**…**) is used to indicate that more arguments are possible.

<u>There are three main classes of functions</u>. This classification is based on the number of arguments required by a function. The three classes are:

1. Those that require no argument or parameter because they need no external information. The information that such functions return is fixed. Examples of such

functions include RAND(), PI() and NOW() that return a random number between 0 and 1, the value of Pi, the current date and time respectively.

2. Functions that require a fixed number of arguments. For example, the following functions accept only one argument hence would signal an error when the number of arguments is more than one, INT(), LOG(). There are also some function that two or more arguments. For example ROUNDDOWN() requires two arguments,

3. Functions that accept variable number of arguments. That is the number of arguments can be one, two or more depending on what one intends to do. For example the following are all valid. =SUM(A1:A10), =SUM(A1:A5,A8), =SUM(A1:A3,A5,B6:B8), etc. Here the =SUM has taken on variable parameters, that is one, two, three, etc respectively.

Note that functions that tend to take variable number of arguments have some of the arguments as optional. In such a case, if you leave out the optional arguments, you do not need to enter commas if there are no additional arguments. If there are additional arguments, then commas should be inserted to act as pace holders. For example, if the fv optional argument of the PMT function is omitted, but the type argument is used, you should enter the function as

PMT(rate, nper, pv,,type)

Note that the position of each argument in the function is very important.

It must be noted that if the argument of a function is defined by a range, then the range can be contiguous or non-contiguous. For example, the AVERAGE function has as argument a range, hence stating the function as =AVERAGE(A1:A25,B10:E15) is a valid expression.

While some functions such as PMT, require values, other functions such as LEFT, require text. Such text should be enclosed in quotation marks (“ “). Quotation marks in any text should be enclosed in extra quotation marks.

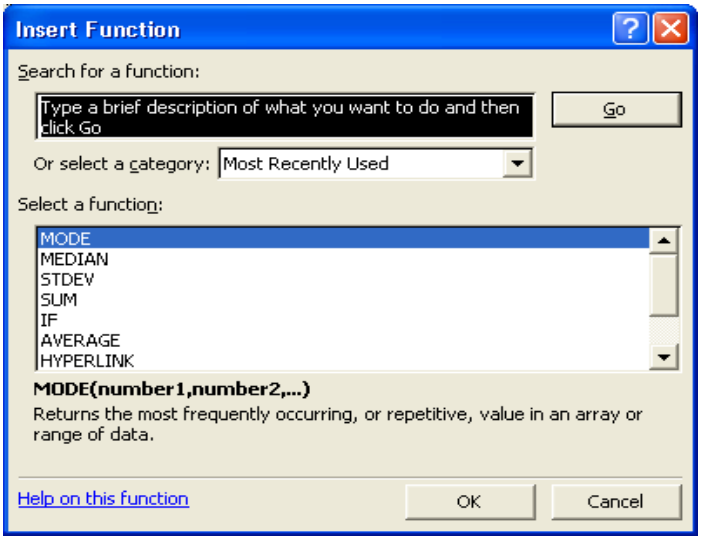
Entering a Function

Functions can be keyed directly into a cell or entered using the Insert Function button.

Insert Function – Creating functions can seem difficult, especially with the potentially different ways to spell a function name (AVG, AVE, AVERAGE) and the number of arguments available. The Insert Function can be used to make entering a function much easier. It guides you through the process and explains each function as well as each argument within a function.

To insert a function and its arguments into the worksheet, follow these steps;

1. Select the cell where you want to enter the function. If you are entering a formula in the formula bar, move the insertion point to where you want the function inserted.
2. Choose **Insert, Function** or click the Insert Function button to display the Insert Function dialog box.



3. Select type of function you want from the Function category List. All the functions for that particular category are then listed below.

4 Choose the specific function that you want and read the description in the lower part of the dialog box.

5 Verify that this is the function you want and choose OK.

6. The Function Arguments dialog box appears. It guides you through the entry of the data to be used in the formula. Next to each argument name is a box where the arguments are entered. You can either key the data into the argument box or select the appropriate cells from the worksheet to enter them into the argument box.
7. Choose OK to complete the function and insert it in a cell. You may choose cancel if you decide not to insert the function.

Note that once data is entered into the argument boxes, the result of the formula is displayed at the bottom of the formula palette.

Auto Sum Button

The most frequently used function is SUM ( ). This function totals the numeric value of all cells in the ranges it references. For example = SUM (B10:B20) will total all the cells starting from cell B10 right up to cell B20, with both B10 and B20 included. Because SUM ( ) is frequently used, an AutoSum button which you can use to total adjacent columns or rows automatically, appears on the standard toolbar. In addition to entering the SUM ( ) function, the AutoSum button when clicked, selects the cells in the column above the SUM ( ). If the suggested range is not correct, you may drag through the desired ranged with the mouse and then press enter. Notice that the status bar displays the sum of the selected range.

As an example;

To enter the sum of cells A1 to A12 in cell A13, lace the cell pointer in cell A13 and click the Auto Sum button. The formula = SUM (A1:12) appears in the formula bar. To select the range of cells to total, highlight the range to sum including blank cell(s) to the right or below the range. When you select the AutoSum button, Excel fills in totals. Sum totals appear in blank cells below and to the right of a range of numbers.

Clicking on the arrow to the right of the Auto Sum button gives you the option of choosing other functions such as Average, Count of entries in the selected range, minimum entries, etc.

CATEGORIES OF FUNCTIONS

Excel 2007 includes over **300 functions** that are divided into the following **twelve** alphabetical categories by Microsoft Company:

1. Add-in Automation Functions
2. Cube Functions
3. Database Functions
4. Date and time Functions
5. Engineering Functions
6. Financial Functions
7. Information Functions
8. Logical Functions
9. Lookup and Reference Functions
10. Math and Trigonometry Functions
11. Statistical Functions
12. Text Functions

Some of the most commonly used Excel functions are explained below.

Date and Time Functions

Excel's date and time functions manipulate or calculate dates and times. Excel can make calculations using dates and time because the dates and times are represented as serial numbers. The number starts with January 1, 1900. Thus, January 1, 1900 has the serial number 1, January 2, 1900 has serial number 2, February 1, 1900 has serial number 32, etc. Note that if a cell s formatted as date, then a date will be displayed in one of the date formats but internally this date will be a serial number.

The Now Function.

The NOW function calculates the serial number of the date and time in the computer's clock. Excel updates the date and time only when the worksheet is opened or

recalculated. The NOW function does not take in any argument and has the format

= NOW()

The NOW function is different from other functions in that it takes no arguments. For example if NOW() was entered in a worksheet cell which was opened at 6.30 pm. on January 1, 1997, it will display 35431.77083 in the cell. The 35431 represents the number of days beginning from 1st January 1900 to January 1, 1997 and 0.77083 represents the decimal fraction of 6.30 p.m. (18.30) in a 24 hour day, i.e. 18.5 /24.

The TODAY Function

The TODAY function calculates the date serial number for the current date, which is the current date from the system clock on the computer. It acts in the same way as the NOW function but does return the time portion of the serial number. The format for the TODAY function is

= TODAY ().

Here too, the TODAY function takes no arguments. For example if TODAY was entered in a worksheet cell that is recalculated at 6.30 pm on January 1, 1997, it will display 35431 in the cell.

The DATE function

The DATE function calculates the date serial number for a specific date. If the cell format was General before the function was entered, the result is formatted as a date. The format of the DATE function is.

= DATE (year, month, day)

Year represents the year and is a number from 1900 to 9999. *Month* represents the month and is a number from 1 to 12. *Day* represents the day and is a number from 1 to 31 depending on the month. The serial number of September 28, 2010 can be obtained using the formula.

= DATE (2010, 9, 28)

The result of this formula is 40450, which is the date serial number of September 28, 2010.

The table below gives the full list of date and time functions

Function	Description
DATE	Returns the serial number of a particular date. . Example DATE(2010/1/6) returns 40184.
DATEVALUE	Converts a date in the form of text to a serial number. Example DATEVALUE("1/1/2000") returns 36526.
DAY	Converts a serial number to a day of the month. Example DAY(1/1/2000) returns 1.
DAYS360	Calculates the number of days between two dates based on a 360-day year. A 360-day year assumes that each of the twelve months has 30 days.
EDATE	Returns the serial number of the date that is the indicated number of months before or after the start date
EOMONTH	Returns the serial number of the last day of the month before or after a specified number of months
HOUR	Converts a serial number to an hour
MINUTE	Converts a serial number to a minute
MONTH	Converts a serial number to a month
NETWORKDAYS	Returns the number of whole workdays between two dates
NOW	Returns the serial number of the current date and time
SECOND	Converts a serial number to a second
TIME	Returns the serial number of a particular time
TIMEVALUE	Converts a time in the form of text to a serial number
TODAY	Returns the serial number of today's date
WEEKDAY	Converts a serial number to a day of the week

WEEKNUM	Converts a serial number to a number representing where the week falls numerically with a year
WORKDAY	Returns the serial number of the date before or after a specified number of workdays
YEAR	Converts a serial number to a year
YEARFRAC	Returns the year fraction representing the number of whole days between start_date and end_date

Math and Trig functions.

Mathematical functions provide the foundation for the majority of worksheet calculations. Most scientific and engineering functions are found under mathematical functions.

Since trigonometric functions use angles measured in radians, use these equations to convert between radians and degrees for the functions that follow.

Radians = Degrees * P/180

Degrees = Radians * 180/P where P = 22/7

The most commonly used mathematical and trig functions are as given below:

Function	Description	EXAMPLE
ABS	Returns the absolute value of a number	ABS(-4.50
ACOS	Returns the arccosine of a number	ACOS(0.005)
ACOSH	Returns the inverse hyperbolic cosine of a number	ACOSH(5)
ASIN	Returns the arcsine of a number	ASIN(0.005)
ASINH	Returns the inverse hyperbolic sine of a number	ASINH(5)
ATAN	Returns the arctangent of a number	ATAN(0.005)

ATAN2	Returns the arctangent from x- and y-coordinates	ATAN(10,5)
ATANH	Returns the inverse hyperbolic tangent of a number	ATANH(5)
CEILING	Rounds a number to the nearest integer or to the nearest multiple of significance	CEILING(3.02,1)
COMBIN	Returns the number of combinations for a given number of objects. For example, the example to the right shows how many groups of 2 can be obtained from 5 objects and the answer 10	COMB(5,2)
COS	Returns the cosine of a number	COS(3.1412)
COSH	Returns the hyperbolic cosine of a number	COSH(0.05)
DEGREES	Converts radians to degrees	DEGREES(3.1414)
EVEN	Rounds a number up to the nearest even integer	EVEN(121)
EXP	Returns *e* raised to the power of a given number	EXP(4)
FACT	Returns the factorial of a number	FACT(6)
FACTDOUBLE	Returns the double factorial of a number	FACTDOUBLE(6)
FLOOR	Rounds a number down, toward zero	FLOOR(12.1234,2)
GCD	Returns the greatest common divisor	GCD(12,15,24,36)
INT	Rounds a number down to the nearest integer	INT(34.45)

LCM	Returns the least common multiple	LCM(2,4,7)
LN	Returns the natural logarithm of a number	LN(23)
LOG	Returns the logarithm of a number to a specified base	LOG(23)
LOG10	Returns the base-10 logarithm of a number	LOG10(34)
MDETERM	Returns the matrix determinant of an array	
MINVERSE	Returns the matrix inverse of an array	
MMULT	Returns the matrix product of two arrays	
MOD	Returns the remainder from division	MOD(7,3)
MROUND	Returns a number rounded to the desired multiple	MROUND(13,4)
MULTINOMIAL	Returns the multinomial of a set of numbers	MULTINOMIAL(3,4)
ODD	Rounds a number up to the nearest odd integer	ODD(46)
PI	Returns the value of pi	
POWER	Returns the result of a number raised to a power	POWER(3,4)
PRODUCT	Multiplies its arguments	PRODUCT(3,4,5)
QUOTIENT	Returns the integer portion of a division	QUOTIET(47,9)
RADIANS	Converts degrees to radians	RADIANS(60)
RAND	Returns a random number between 0	

	and 1	
RANDBETWEEN	Returns a random number between the numbers you specify	
ROMAN	Converts an arabic numeral to roman, as text	ROMAN(23,3)
ROUND	Rounds a number to a specified number of digits	ROUND(1.2345,2)
ROUNDDOWN	Rounds a number down, toward zero	ROUNDDOWN(1.234,2)
ROUNDUP	Rounds a number up, away from zero	
SERIESSUM	Returns the sum of a power series based on the formula	
SIGN	Returns the sign of a number	
SIN	Returns the sine of the given angle	
SINH	Returns the hyperbolic sine of a number	
SQRT	Returns a positive square root	
SQRTPI	Returns the square root of (number * pi)	
SUBTOTAL	Returns a subtotal in a list or database	
SUM	Adds its arguments	
SUMIF	Adds the cells specified by a given criteria	
SUMIFS	Adds the cells in a range that meet multiple criteria	
SUMPRODUCT	Returns the sum of the products of corresponding array components	

SUMSQ	Returns the sum of the squares of the arguments	
SUMX2MY2	Returns the sum of the difference of squares of corresponding values in two arrays	
SUMX2PY2	Returns the sum of the sum of squares of corresponding values in two arrays	
SUMXMY2	Returns the sum of squares of differences of corresponding values in two arrays	
TAN	Returns the tangent of a number	TAN(45)
TANH	Returns the hyperbolic tangent of a number	TANH(1.667)
TRUNC	Truncates a number to an integer	TRUNC(12.2345,2)

Statistical functions

Excel's statistical functions are used on lists of data. Some of the simple statistical functions are AVERAGE, MAX, and MIN. Excel also includes very complex statistical functions that can calculate deviations, distributions, correlations, and slopes. Below is the alphabetical listing of important statistical functions.

Function	Description
AVEDEV	Returns the average of the absolute deviations of data points from their mean
AVERAGE	Returns the average of its arguments
AVERAGEA	Returns the average of its arguments, including numbers, text, and logical values

AVERAGEIF	Returns the average (arithmetic mean) of all the cells in a range that meet a given criteria
AVERAGEIFS	Returns the average (arithmetic mean) of all cells that meet multiple criteria.
BETADIST	Returns the beta cumulative distribution function
BETAINV	Returns the inverse of the cumulative distribution function for a specified beta distribution
BINOMDIST	Returns the individual term binomial distribution probability
CHIDIST	Returns the one-tailed probability of the chi-squared distribution
CHIINV	Returns the inverse of the one-tailed probability of the chi-squared distribution
CHITEST	Returns the test for independence
CONFIDENCE	Returns the confidence interval for a population mean
CORREL	Returns the correlation coefficient between two data sets
COUNT	Counts how many numbers are in the list of arguments
COUNTA	Counts how many values are in the list of arguments
COUNTBLANK	Counts the number of blank cells within a range
COUNTIF	Counts the number of cells within a range that meet the given criteria
COUNTIFS	Counts the number of cells within a range that meet multiple criteria
COVAR	Returns covariance, the average of the products of paired deviations
CRITBINOM	Returns the smallest value for which the cumulative binomial distribution is less than or equal to a criterion value

DEVSQ	Returns the sum of squares of deviations
EXPONDIST	Returns the exponential distribution
FDIST	Returns the F probability distribution
FINV	Returns the inverse of the F probability distribution
FISHER	Returns the Fisher transformation
FISHERINV	Returns the inverse of the Fisher transformation
FORECAST	Returns a value along a linear trend
FREQUENCY	Returns a frequency distribution as a vertical array
FTEST	Returns the result of an F-test
GAMMADIST	Returns the gamma distribution
GAMMAINV	Returns the inverse of the gamma cumulative distribution
GAMMALN	Returns the natural logarithm of the gamma function, Γ(x)
GEOMEAN	Returns the geometric mean
GROWTH	Returns values along an exponential trend
HARMEAN	Returns the harmonic mean
HYPGEOMDIST	Returns the hypergeometric distribution
INTERCEPT	Returns the intercept of the linear regression line
KURT	Returns the kurtosis of a data set
LARGE	Returns the k-th largest value in a data set
LINEST	Returns the parameters of a linear trend
LOGEST	Returns the parameters of an exponential trend
LOGINV	Returns the inverse of the lognormal distribution

LOGNORMDIST	Returns the cumulative lognormal distribution
MAX	Returns the maximum value in a list of arguments
MAXA	Returns the maximum value in a list of arguments, including numbers, text, and logical values
MEDIAN	Returns the median of the given numbers
MIN	Returns the minimum value in a list of arguments
MINA	Returns the smallest value in a list of arguments, including numbers, text, and logical values
MODE	Returns the most common value in a data set
NEGBINOMDIST	Returns the negative binomial distribution
NORMDIST	Returns the normal cumulative distribution
NORMINV	Returns the inverse of the normal cumulative distribution
NORMSDIST	Returns the standard normal cumulative distribution
NORMSINV	Returns the inverse of the standard normal cumulative distribution
PEARSON	Returns the Pearson product moment correlation coefficient
PERCENTILE	Returns the k-th percentile of values in a range
PERCENTRANK	Returns the percentage rank of a value in a data set
PERMUT	Returns the number of permutations for a given number of objects
POISSON	Returns the Poisson distribution
PROB	Returns the probability that values in a range are between two limits
QUARTILE	Returns the quartile of a data set

RANK	Returns the rank of a number in a list of numbers
RSQ	Returns the square of the Pearson product moment correlation coefficient
SKEW	Returns the skewness of a distribution
SLOPE	Returns the slope of the linear regression line
SMALL	Returns the k-th smallest value in a data set
STANDARDIZE	Returns a normalized value
STDEV	Estimates standard deviation based on a sample
STDEVA	Estimates standard deviation based on a sample, including numbers, text, and logical values
STDEVP	Calculates standard deviation based on the entire population
STDEVPA	Calculates standard deviation based on the entire population, including numbers, text, and logical values
STEYX	Returns the standard error of the predicted y-value for each x in the regression
TDIST	Returns the Student's t-distribution
TINV	Returns the inverse of the Student's t-distribution
TREND	Returns values along a linear trend
TRIMMEAN	Returns the mean of the interior of a data set
TTEST	Returns the probability associated with a Student's t-test
VAR	Estimates variance based on a sample
VARA	Estimates variance based on a sample, including numbers, text, and logical values
VARP	Calculates variance based on the entire population

VARPA	Calculates variance based on the entire population, including numbers, text, and logical values
WEIBULL	Returns the Weibull distribution
ZTEST	Returns the one-tailed probability-value of a z-test

Text Functions

Text functions enable you to manipulate text. You can abbreviate text to pull-out portions you need from long strings of text, or you can change numbers and dates to text so that they can exceed a cells width without producing a cell filled with #####. These numbers or dates converted to text can be joined (or concatenated) to form titles, labels, etc.

Function	Description
CHAR	Returns the character specified by the code number
CLEAN	Removes all nonprintable characters from text
CODE	Returns a numeric code for the first character in a text string
CONCATENATE	Joins several text items into one text item
DOLLAR	Converts a number to text, using the $ (dollar) currency format
EXACT	Checks to see if two text values are identical
FIND, FINDB	Finds one text value within another (case-sensitive)
FIXED	Formats a number as text with a fixed number of decimals
LEFT, LEFTB	Returns the leftmost characters from a text value
LEN, LENB	Returns the number of characters in a text string

LOWER	Converts text to lowercase
MID, MIDB	Returns a specific number of characters from a text string starting at the position you specify
PROPER	Capitalizes the first letter in each word of a text value
REPLACE, REPLACEB	Replaces characters within text
REPT	Repeats text a given number of times
RIGHT, RIGHTB	Returns the rightmost characters from a text value
SEARCH, SEARCHB	Finds one text value within another (not case-sensitive)
SUBSTITUTE	Substitutes new text for old text in a text string
TEXT	Formats a number and converts it to text
TRIM	Removes spaces from text
UPPER	Converts text to uppercase
VALUE	Converts a text argument to a number

Financial Functions

Excel provides many financial functions that are used for calculating loan details, investment analyses, annuities, etc. An annuity is a periodic series of equal payments. Examples of annuities are mortgage payment on a house, payment of a car loan, or payment that you make to a retirement fund.

The common arguments used in Excel's financial function are as follows.

Argument	**Argument name**	**Description**
Present value	Pv	The current value of amounts to be received or paid

		in the future discounted at some interest rate; the amount that must be invested today at some interest rate to accumulate to some specific future value.
Number of periods	nper	The number of payments that will be made to an investment or loan. For example, a five-year loan with monthly payments would have 60 periods.
Payment	pmt	The amount paid or collected for each period.
Future value	fv	The value of a loan or investment at the end of all the periods.
Rate	rate	The interest rate being charged or paid.
Type	type	Payments can either be made in arrears (at the end of each period) or in advance (at the beginning of each period). The type argument determines whether the calculation will be based on payments made in arrears or in advance. Type is the number O (payments in arrears) or 1 (payments in advance). If type is omitted, it is assumed to be O.

Function	Description
ACCRINT	Returns the accrued interest for a security that pays periodic interest
ACCRINTM	Returns the accrued interest for a security that pays interest at maturity
AMORDEGRC	Returns the depreciation for each accounting period by using a depreciation coefficient
AMORLINC	Returns the depreciation for each accounting period
CUMIPMT	Returns the cumulative interest paid between two periods
CUMPRINC	Returns the cumulative principal paid on a loan between two

	periods
DB	Returns the depreciation of an asset for a specified period by using the fixed-declining balance method
DDB	Returns the depreciation of an asset for a specified period by using the double-declining balance method or some other method that you specify
DISC	Returns the discount rate for a security
DURATION	Returns the annual duration of a security with periodic interest payments
FV	Returns the future value of an investment
INTRATE	Returns the interest rate for a fully invested security
IPMT	Returns the interest payment for an investment for a given period
IRR	Returns the internal rate of return for a series of cash flows
ISPMT	Calculates the interest paid during a specific period of an investment
MIRR	Returns the internal rate of return where positive and negative cash flows are financed at different rates
NOMINAL	Returns the annual nominal interest rate
NPER	Returns the number of periods for an investment
NPV	Returns the net present value of an investment based on a series of periodic cash flows and a discount rate
PMT	Returns the periodic payment for an annuity
PPMT	Returns the payment on the principal for an investment for a given period
PV	Returns the present value of an investment

RATE	Returns the interest rate per period of an annuity
RECEIVED	Returns the amount received at maturity for a fully invested security
SLN	Returns the straight-line depreciation of an asset for one period
SYD	Returns the sum-of-years' digits depreciation of an asset for a specified period
TBILLEQ	Returns the bond-equivalent yield for a Treasury bill
TBILLYIELD	Returns the yield for a Treasury bill
XIRR	Returns the internal rate of return for a schedule of cash flows that is not necessarily periodic
XNPV	Returns the net present value for a schedule of cash flows that is not necessarily periodic
YIELD	Returns the yield on a security that pays periodic interest
YIELDDISC	Returns the annual yield for a discounted security; for example, a Treasury bill
YIELDMAT	Returns the annual yield of a security that pays interest at maturity

Examples

(i) If one borrows ¢1,000,000.00 at an interest rate of 12% per annum, and you are to repay the loan in 5 years (60 monthly instalments), then the PMT function would return a value equal to the amount of money that should be paid every month. Because the payments are made monthly, the interest rate must also be monthly; therefore the annual rate of interest must be divided by 12 to obtain the rate per one period (i.e. one month). The payment value of the amount borrowed is -1,000,000.00, because no payments have yet to be made. For all arguments, negative number represents cash you pay out, while cash you receive is represented by a positive number. The following PMT function will return the required monthly payment.

= PMT (12% /12, 60, - 1000000.00)

(ii) To calculate how much money you will have in 15 years if you deposit ¢200,000 a month into an annuity that earns 10% annually, use the following function.

=FV (10% /12, 15*12, -200,000).

(iii) To calculate the present value of 60 payments of ¢150,000 with a 5% annual percentage rate, use the following function

=PV (5% /12, 60, 150000)

i.e. if one pays ¢150,000 monthly, for a five year period when the interest rate during the period is 5% per annum, then the present value of their total investment is calculated by the function

=PV (5% /12, 60, 150000).

Logical Functions

Excels logical functions allow you to build conditional features into your spreadsheet models. They test whether or not a statement is True or False and return a result. A question that can be answered with true or false is considered a logical test. A value of 0 means false, and a value of 1 means True.

The FALSE function.

This function always returns a logical FALSE , permitting you to use it to avoid ambiguity in formulas. It has no arguments.

Format is FALSE() or FALSE

E.g. = IF (A3 = 10,"A3 is equal to 10",FALSE())

The above formula means if A3 is equal to 10, the string "A3 is equal to 10" will be stored in the cell. If A3 is not equal to 10, a "0" will be stored there. It may seem a lot quicker to type "0" than to type FALSE (), but the function is self-documenting.

The TRUE function.

The function is similar to the FALSE function but does the opposite. It always returns a logical TURE.

Format is TRUE () or TURE.

The NOT function.

This function reverses the result of the logical argument from TRUE to FALSE or from FALSE to TRUE.

Format is NOT(logical)

E.g. If C1 = 5, and D1 = 10

Then CI > D1 is false but NOT (C1 > D1) is true.

The AND function.

This joins test conditions. It returns TRUE if all logical argument are TRUE, and FALSE if any logical argument is FALSE. Logical arguments include statements such as C10> 20 or A4 + A10 = 16

Format is AND (logical1 , logical2 …)

e.g. if C1 = 10, D1 = 16 and E1= 20

Then AND (C1 >D1, E1>10) will return FALSE since the first logical argument (C1>D1) is false. Both logical arguments (or conditions) must be true for the statement to be TRUE.

The OR function

The function joins test conditions like the AND function but returns TRUE if one or more logical arguments is TRUE, and FALSE only if all logical arguments are FALSE.

Format is OR (logical 1, logical 2, ..)

E.g. If C1 =10, D1 = 16 and E1 =20

Then OR (C1>D1, E1>10) will return TRUE since at least one logical argument is TRUE.

The IF function

This function permits you to test a logical condition to determine the appropriate value for a cell.

Format is: IF (logical test**,** value-if-true**,** value if false)

Arguments

Logical test – this is any logical expression that can be evaluated as true or false, e.g. A1=B10, A1= " PASS", A1> =4, B10-C5<B12, etc.

The conditions can also be joined by compound operators such as OR, AND, and NOT E.g. T1=1 AND S1>1000000, or NOT(T1 <40 OR T1> 60).

Value-if-true - This is the value the cell containing the IF function will assume if the condition is true. This can be a cell reference, a value or text (which should be enclosed in double quotation marks) e.g. A5, "GHANA", 200.00.

Value-if-false - This is the value the cell containing the 1F function will assume if the condition is false. All conditions listed under value if true also apply here.

EXAMPLE

Suppose cell B10 contain the logical function below

= IF (F1 > 40, (F1-40)*1.5,0)

And assuming cell F1 contains the hours worked by an employee for the week, then the above means "if the hours worked for the week is greater than 40, subtract 40 from the hours worked and multiply the result by 1.5, putting the result in cell B10. If the hours worked for the week is not greater then (i.e. less than or equal to) 40 then cell B10 should contain 0.

One can also have nested conditions such as

= IF (TYPE = 1, IF (SALE> 1000000, 0.08, 0.05), IF SALE>2500000,0.06,0.03))

Assume the above logical condition is in cell A1 and represents **Discount**. The above means that:

If Type is 1

And If SALE is greater than 1,000,000

Then Discount = 0.08

Else Discount = 0.05

Else (i.e. if Type is not 1)

And If SALE is greater than 2,500,000

Then Discount = 0.06

Else Discount = 0.03

Exercise 1

Employees of KNUST Computer Company are paid on hourly basis at the end of every month. If an employee works for not more than 40 hours a month, it is considered regular and Overtime for hours worked in excess of 40. Regular hours are paid at 50 cedis per hour while the overtime rate is one and half times the regular rate per hour. All employees are to pay 15% of their gross pay as Income Tax, 2.5% as National Health Insurance Levy, 1% as District Tax. Employees who have more than three children are to pay 1 cedi per child in excess of three towards GetFUND. Assume you have just been employed by the above company and that you have been given the spreadsheet below to complete.

C23

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2			JB PABBI AND SONS CONSULTANTS LIMITED					Income Tax Rate (%)	0.15			
3								District Tax Rate (%)	0.03			
4			STAFF SALARIES FOR MARCH 2008					NHIL rate (%)	0.01			
5												
6		Staff	Hours Worked	No. of Children	Gross Pay	Income Tax	NHIL	District Tax	GetFUND	Net Pay		
7		John	65	3								
8		Rose	48	0								
9		Ekua	22	6								
10		Peter	32	5								
11		Ibrahim	80	10								
12		Isaac	12	1								
13		Cynthia	45	2								
14		James	25	2								
15		Kwaku	33	3								
16		Geroge	67	2								
17		Michael	23	6								
18		Emmanuel	45	8								
19		Stephen	56	5								
20		Alfred	34	3								
21		Charles	81	6								
22												
23		Total										
24												
25												
26												

What formulas will be needed in the following cells such that they can later be copied into other cells to complete the worksheet. The percentage tax rate for income, district and NHIL are to be picked from the spreadsheet. Note, your formulas should be such that whenever the income tax rate, the district tax rate and the NHIL rate change, only their corresponding new values have to be entered to replace the exiting ones in cells I2, I3 and I4 respectively, and that there will be no need to re-copy any formula from one cell to another for subsequent changes in the rates.

(i)	E7	(ii)	F7	(iii)	G7	(iv)	H7
(v)	I7	(vi)	J7	(vii)	C23 through to J23		

Exercise 2

A Social Science lecturer marked her mid semester and end of semester examination scripts each over 100 instead of 30 and 70 respectively. After marking she decided to use Excel to compute the final marks of the students and also indicate the appropriate letter grade of every student to determine how many students scored each of the letter grade. The following is the spreadsheet that she has managed to create. Her problem now is to put in formulas to complete her work.

	A	B	C	D	E	F	G	I	J
3		COMPUTER SCIENCE DEPARTMENT, KNUST							
4		CSM 184 INTRODUCTION TO COMPUTER II							
5	S/N	INDEX NO.	mid sem	Exams	Final	Grade			
6	1	10021007	65	78					
7	2	10021107	48	54					
8	3	10021207	22	90					
9	4	10021307	32	32					
10	5	10021407	80	66					
11	6	10021507	12	60					
12	7	10021607	45	48					
13	8	10021707	25	65					
14	9	10021807	33	45					
15	10	10021907	67	56					
16	11	10022007	23	33					
17	12	10022107	45	45					
18	13	10022207	56	67					
19	14	10022307	34	90					
20	15	10022407	81	67					
21									
22		GRADE	NUMBER						
23		A							
24		B							
25		C							
26		D							
27		F							
28		MAXIMUM							
29		MINIMUM							
30		AVERAGE							

Assume this lecturer wants you to help, what formulas will be required into the following cells:

(i) E6 (ii) F6 (iii) C23 (iv) C24

(v) C25 (vi) C26 (vii) C27 (viii) C28

(ix) C29 (x) C30

Lookup and reference functions

Function	Description
ADDRESS	Returns a reference as text to a single cell in a worksheet

CHOOSE	Chooses a value from a list of values
COLUMN	Returns the column number of a reference
COLUMNS	Returns the number of columns in a reference
HLOOKUP	Looks in the top row of an array and returns the value of the indicated cell
INDEX	Uses an index to choose a value from a reference or array
INDIRECT	Returns a reference indicated by a text value
LOOKUP	Looks up values in a vector or array
MATCH	Looks up values in a reference or array
OFFSET	Returns a reference offset from a given reference
ROW	Returns the row number of a reference
ROWS	Returns the number of rows in a reference
TRANSPOSE	Returns the transpose of an array
VLOOKUP	Looks in the first column of an array and moves across the row to return the value of a cell

CHAPTER FOUR

FORMATING WORKSHEETS

Formatting a Table Automatically

Autoformating is designed to apply to tables of information in which labels run down the left column and across the top row. SUM() functions or totals are expected in the bottom row or right column. These preset formats include formatting for numbers, borders, font, pattern, alignment, column width, and row height. You have the option of selecting which of these formatting elements is used when you format with **Format, AutoFormat** Command

To apply an AutoFormat to a table follow these steps:

1. Select the range you will like to format as a table
2. Click at the **home** tab, select **format as tables** from the **style** group
3. Choose any of the format. This is because as you move over the different formats you will not get a preview of the format so just choose any of the formats. You will then see the following dialog box asking for the range of cells to format.

4. Just click OK since the range you selected in step (1) will used to create the table. You may check the **My table has headers** if indeed your table has headers and are to be treated different from the other cells.
5. To specify exactly how your table should like, click the home button, select **format as tables** from the **style** group just like you did in step 2 above.
6. As you now move the mouse pointer over the different formats, you will get a preview of exactly how your table is going to look like. When you find a format of your choice, simply clicking at that format.

Choose **Edit, Undo** to return to the previous format:

Choosing and Pasting Formats.

With the Format Painter button you can copy formats from one cell to another.

All formats that apply to the selected cells are copied including number, text, background, and border formats.

To copy formatting from a range of cells to another range of cells of the same size, follow these steps;

1. Select the source range.
2. Click the Format Painter button by first clicking the home button.
3. Select the first cell in the destination range and release the mouse button.

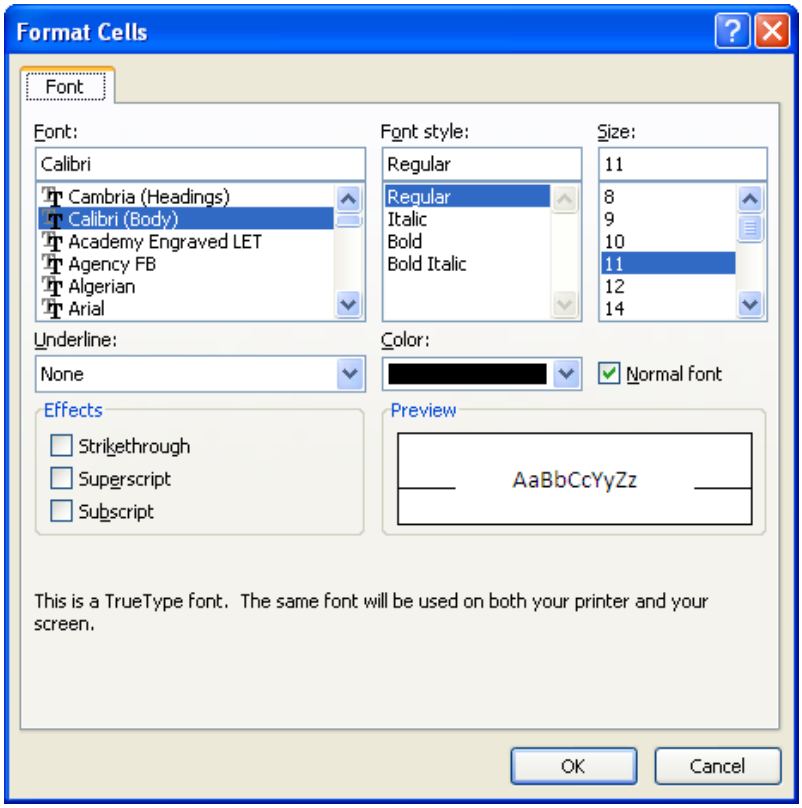
To copy to more than one cell or range,

Double click the Format Painter button in step 2 above. Select the first destination cell or range and release the mouse button. Then select subsequent destination cells or ranges.

4. When you have finished, click the Format Painter Button again or press Esc.

Formatting Selected Characters in a Cell

1. Select the cell containing the text you want to change.
2. Select the text in the formula bar that you want to change by dragging across it with the mouse or by pressing shift + arrow key.
3. Click the appropriate buttons such as bold, underline, italic etc. You can also use the format cell dialog box by first clicking at the **home** button, the **format** from the cells group and then **format cells** to get the format cell dialog box as follows:



4. Make the necessary changes according to how you will want the characters to appear
5. Choose OK

Formatting Cells or Characters with Toolbars

Most of the cell formats are found on the formatting toolbar when the **ribbon** is maximized. Use them to format characters in cells. The following shortcut keys may be used for formatting instead of the toolbar.

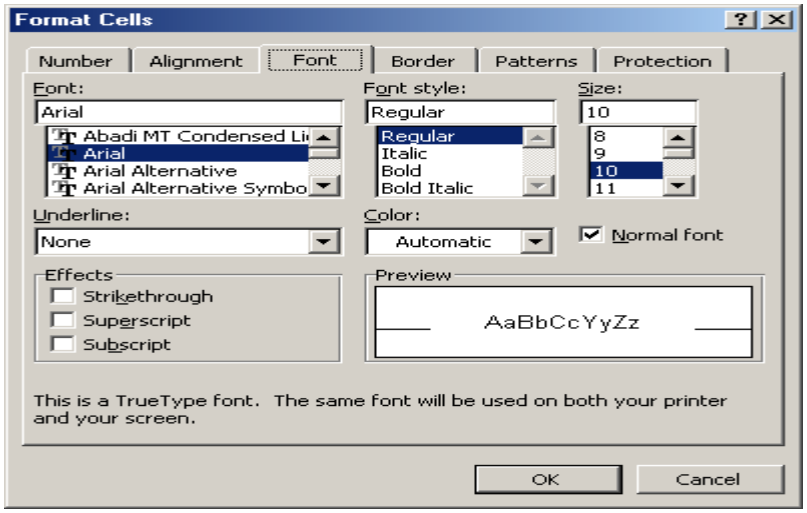
Format	**Shortcut key**
Bold	Ctrl+2 or Ctrl+B
Italic	Ctrl+3 or Ctrl+I
Underline	Ctrl+4 or Ctrl+U
Strikethrough	Ctrl+5

Changing Character Fonts, Sizes, Styles, and Colours

Fonts are the various typefaces used in printed materials. Fonts heights are measure in points. One inch = 72pts. By styles we mean plain, bold, italic, underline and strikethrough. You can also change colors. Excels can use up to 256 different font in a worksheet.

To change character fonts, sizes, styles, and colors, follow these steps;

1. Select the cell, range or multiple ranges.
2. From **Home** and under the **cell** group select **format** and then **format cells** to display the format Cells dialog box below.
3. Select the Font Tab if not already on.
4. Select Font, Style, Size, etc.
5. Choose OK.



Centring Text Across Cells

To center a title using the merge and center button from the Formatting toolbar, follow these steps.

1. Type and format the title in the left cell of the range in which you want the title centered.
2. Select the range.
3. Click the **Merge and Center** button from the **Alignment** group under the **Home**.

Using the Center Across Selection option:

After steps 1 and 2 above,

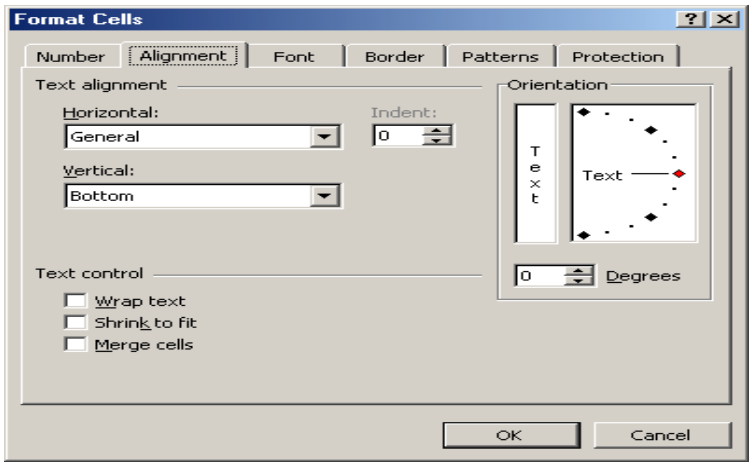
3. Choose Home, Format (from **cell** group), Format Cells and then Select Alignment tab.
4. Select the Center Across Selection Option in the Horizontal drop down list.
5. Choose OK.

The text centers between the cell where the text is entered and the final cell you selected.

Wrapping Text to Fit a Cell

If you make a lengthy text entry in a cell, you can have Excel wrap the text so that it forms a paragraph that fits the cell. The cell's height increases to contain multiple lines. To wrap text to fit a cell, follow these steps;

1. Select the cell or range.
2. Click at the **Wrap text** button from the **alignment** group of **Home** or Choose Home, Format**,** Format cells and then continue with the next step.
3. Select the Alignment tab.



4. Select the Wrap Text Check box.
5. Choose OK.

Aligning and Rotating Text and Numbers.

In unformatted cells, texts align left while numbers aligns right in a column. You can align values or formula results so that they align left, center or right in a cell.

Aligning Cell Entries

Using Formatting toolbar,

1. Select cell or range
2. Click the left, Center or Right Align button in toolbar.

Using Format Menu,

1. Select Cell or range.
2. Choose Home, **Format, Format Cells.**
3. Select the Alignment Tab.
4. Select one of the alignment options in the Horizontal drop-down list. . The options are;
   * General, Left, Center, Right, Fill, Justify, and Center Across Selection.
5. Select one of the options from vertical drop-down list. The options are;
   * Top, Center, Bottom, and Justify.
6. Choose OK.

Rotating Numbers and Text

The default Text orientation is horizontal, reading left to right. To rotate text or numbers,

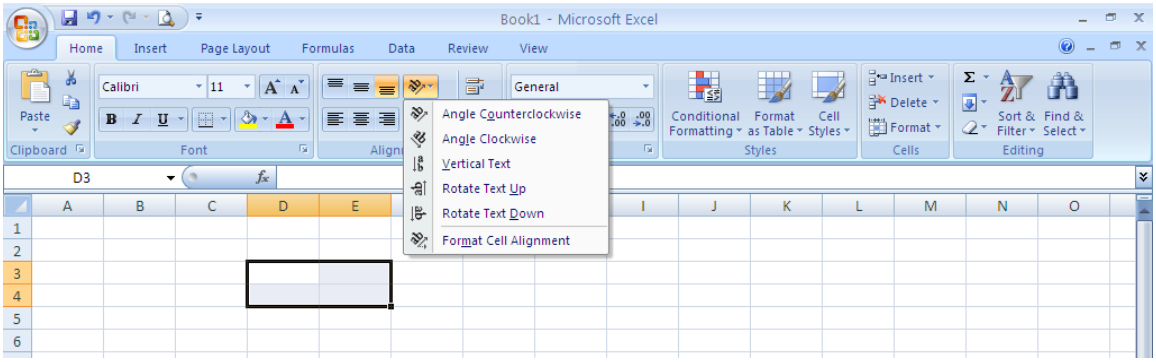
1. Select the cell containing the title or label to be rotated.
2. Choose **Home**, **Format, Format Cells.**
3. Select the Alignment tab.
4. Drag the pointer in the orientation box up or down to change the orientation of the text, OR specify a value in the Degrees box between 90 and –90 degrees. Using the keyboard, press Alt+D and use arrow keys to change orientation.
5. Choose OK.

Using the toolbar to Rotate Numbers and Texts

You can use the toolbar to rotate texts and numbers quickly by the following steps:

1. Select the cells to rotate the content

2. From the **Home** menu, click at the **orientation** button from the **alignment** group to obtain the following:



3. Select the appropriate option and complete the steps.

Formatting Numbers

In addition to Excel's, many already made formats for numbers and date/times, you can design your own custom formats. Unused cells, cut or cleared cells have the General format and displays numbers to the greatest precision possible. If a number is too large, it displays it in scientific format e.g. 5.36E+08. If the number or date is still too large after applying a specific numeric or date format, the cell fills with # symbols.

Shrinking Text to fit a Cell / Merging cells

When you apply the Shrink To Fit option to a cell, the text in the cell is reduced in size so that it fits within the cell.

Follow these steps to shrink text to fit a cell.

1. Select the cell or range containing the text you want to shrink to fit.
2. Choose **Home**, **Format, Format Cells.**
3. Select the Alignment tab.
4. Select the Shrink To Fit check box.
5. Choose OK.

To select a range of cells and merge them into one cell,

1. Select the Merge Cells check box at step 4 above and choose OK.

Joining Together Text or Text and numbers (concatenation).

The & symbol is a concatenation operator that join text, numbers, and dates into one long text string.

For example if B12 contains "Final sales for"

C12 contains 1999

Then = B12 &TEXT(C12, "####")

Final Sales for 1999.

Excels Automatic Number Formatting

Excel examines the format of the number you enter to determine whether the application can format the cell for you. In general format (the default format setting), entering $12.95 will display $12.95 (currency format), entering 15% will display 15% although it appears as .15 in the formula bar.

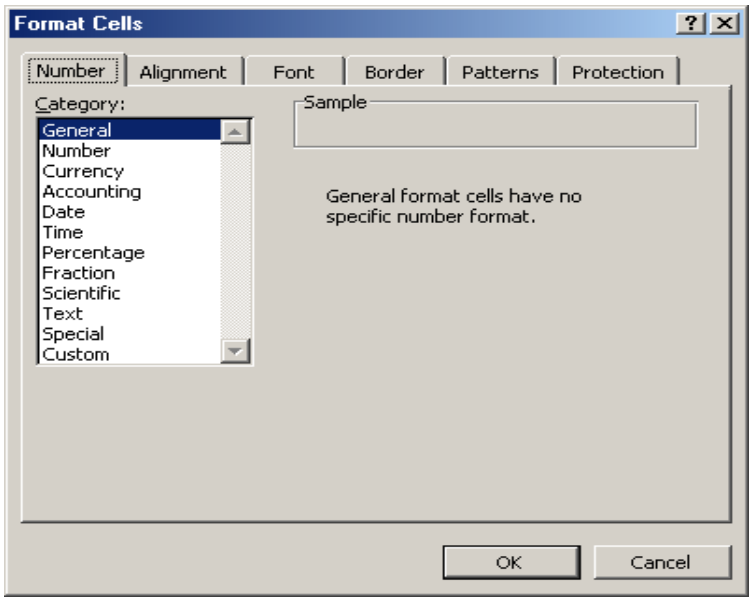
Note: The formatted values that appear on screen may not be the same values used in calculation. (The number of decimal places in the formatted cells may be less and therefore may have been rounded).

Using The Toolbar to format numbers

1. Select the cell or range you want to format.
2. Pull down the Number format from the Home for currency, percentage, comma on the toolbar.

Using Menu Bar to format numbers

1. Select Cell or range.
2. Choose **Home Format, Format Cells.**
3. Select Number Tab.



4. Select the type of number you want to format from the category list.
5. If you select Number, Currency, Accounting, Percentage or Scientific, you may choose the number of decimal paces, choose to use 1000seperators(,), how to show negative numbers or what currency symbol to use.

If you select a Date, Time, Fraction, or Special category, selecte the format you want from the list that appears.

6. Select OK.

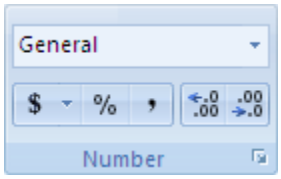
Using Short Cut Keys

1. Select cell or range.
2. Press one of the following keystroke combinations.

Format	Shortcut key
General	Shift + Ctrl + ~
Number (2dp)	Shift + Ctrl + !
Currency	Shift + Ctrl + $
Percent (no dp)	Shift + Ctrl + %
Scientific	Shift + Ctrl + ^

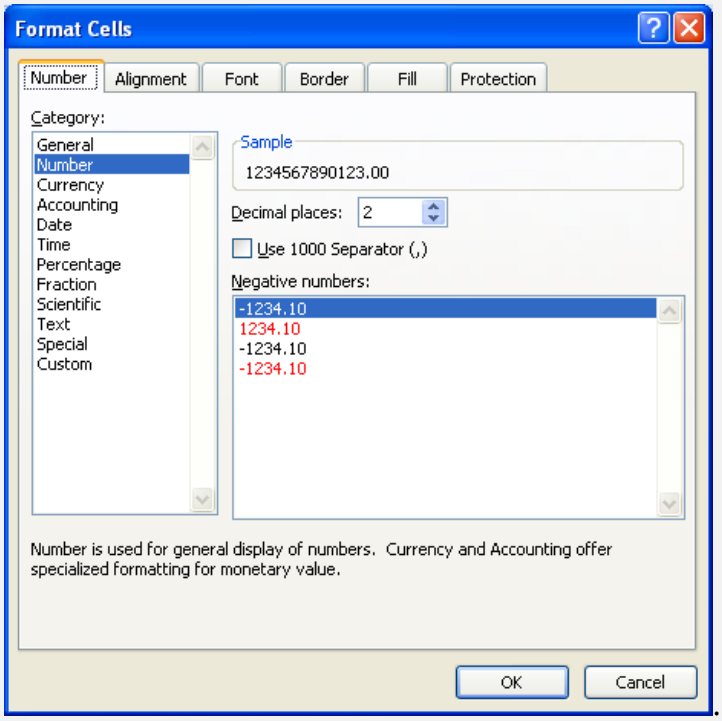
Available number formats

Generally, by applying different number formats, you can change the appearance of numbers without changing the magnitude of the number. A number format does not affect the actual cell value that uses to perform calculations. The actual value is displayed in the formular bar.



Below is a summary of the number formats that are available on the **Home** tab in the **Number** group. It is possible to see all available number formats by clicking the **Dialog Box Launcher** next to **Number**.

Format	Description
General	This is the default number format that Excel applies to numbers when entered. Generally, numbers that are formatted with the **General** format are displayed just the way they are typed. However, if the cell is not wide enough to show the entire number, the **General** format rounds the numbers with decimals. The **General** number format also uses scientific (exponential) notation for very large numbers with at least 12 digits.
Number	This format is used for the general display of numbers. One can specify the number of decimal places to use. In addition, you can specify if you will want to use a thousands separator, and how you want negative numbers to be to displayed.

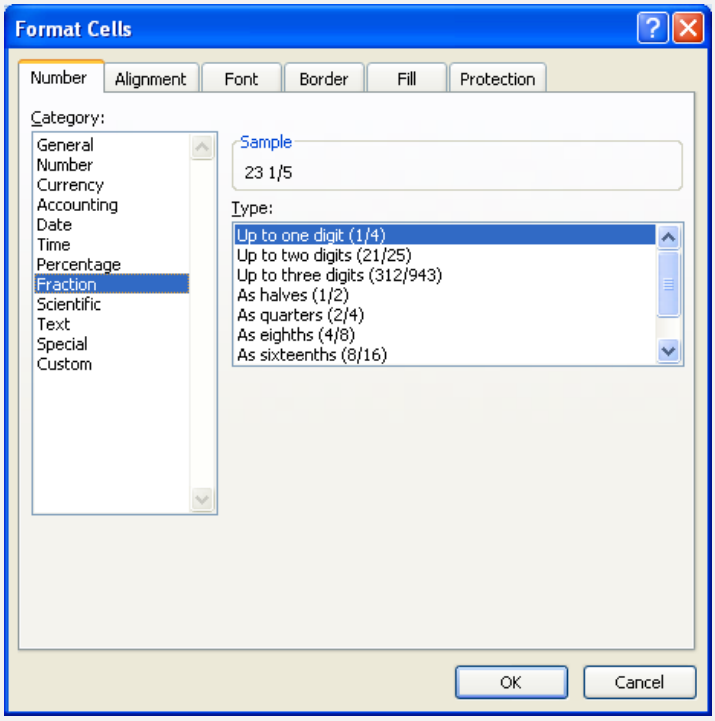


Currency This format is used for general monetary values numbers with the default currency symbol. It is possible specify the number of decimal places that you want to use (by default this is 2), whether you want to use a thousands separator, and how you want to display negative numbers. Note that this format aligns the decimal point of numbers in a column. For example, if the default currency symbol is the pound (£) sign and if the thousand separator is active and cells A1 and A2 contains the numbers 12345.67 and 234.50, the two numbers will be displayed as follows:

£12,345.67
£234.50

Accounting This format is also used for monetary values, but it aligns the currency symbols and decimal points of numbers in a column. For example, if the default currency symbol is the pound (£) sign and if the thousand separator is active and cells A1 and A2 contains the numbers 12345.67 and 234.50, the two numbers will be displayed as follows:

	£12,345.67 £ 234.50
Date	The Date format displays date and time using serial numbers as date values according to the type and locale (location) that you specify. Date formats may begin with an asterisk (*) to respond to changes in regional date and time settings that are specified in Windows Control Panel. Formats without an asterisk are not affected by Control Panel settings.
Time	This format displays date and time using serial numbers as time values according to the type and locale (location) that you specify. Time formats may begin with an asterisk (*) to respond to changes in regional date and time settings that are specified in Windows Control Panel. Formats without an asterisk are not affected by Control Panel settings.
Percentage	This format multiplies the cell value by 100 and displays the result with a percent symbol. It is possible to specify the number of decimal places to use. For example the number 23.2 will be displayed as 2320.00% if the number of decimal places is set to 2.
Fraction	This format displays a number as a fraction according to the type of fraction that you specify. You will normally obtain the following dialog box to specify the type of the fraction:



Scientific	This format displays a number in exponential notation by replacing part of the number with E+*n*, where E is the Exponent and multiplies the preceding number by 10 to the *n*th power. For example, a 2-decimal **Scientific** format displays 123456789 as 1.23E+08, which is 1.23 times 10 to the 8th power. You can specify the number of decimal places to use.
Text	This format treats the content of a cell as text and displays the content exactly as you type irrespective of the type such as number, date or time.
Special	This format displays a number as a postal code (ZIP Code), phone number, or Social Security number.
Custom	This format allows you to modify or customize a copy of an existing number format code to a preferred choice. The custom number format is then added to the list of number format codes. You can add between 200 and 250 custom number formats, depending on the version of Excel installed.

Formatting Rows and Columns

The appearance of worksheets can be improved by adjusting column widths and row heights. Confidential data can even be hidden within the worksheet.

Adjusting Column Width

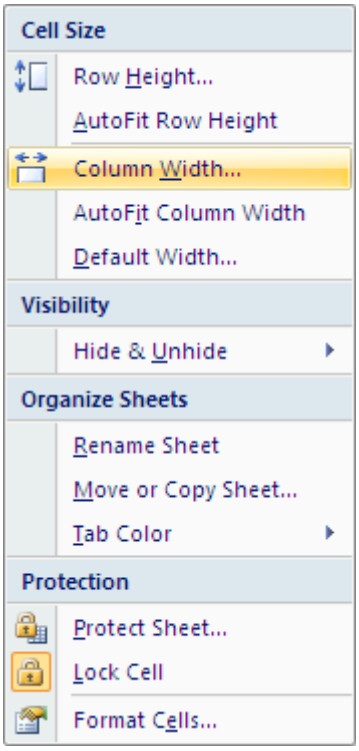
If a column is not wide enough, to display a number, date, or time, Excel displays # characters in the cell. To change one or more column widths with the mouse, follow these steps;

1. Select the columns.
2. Move pointer to column separator directly to the right of the column heading. The pointer changes to a two-headed, horizontal arrow.
3. Drag the column left or right until the shadow is where you want it; then release the mouse button. The width box shows width of column as you drag.

To fit the column to its widest entry using the mouse, double-click the column-heading separator.

To change one or more column width using the menu, follow these steps;

1. Select cells in columns you want to change.
2. Choose **Home**, **Format** You will get the following:



3. Use one of the following techniques to adjust column width.

   * Choose **Column Width** to adjust columns to a specific width. Type the width into the Column Width dialog box that appears

   and Choose OK.

   * Choose **AutoFit Column Width** to fit the column width to the widest cell contents in the selection.

   * Choose **Default Width** and choose OK to accept the default standard column width for the selected column.

4. Choose OK.

Hiding Columns

Columns can be hidden so that they do not print or appear on-screen. To hide a column (e.g. column B),

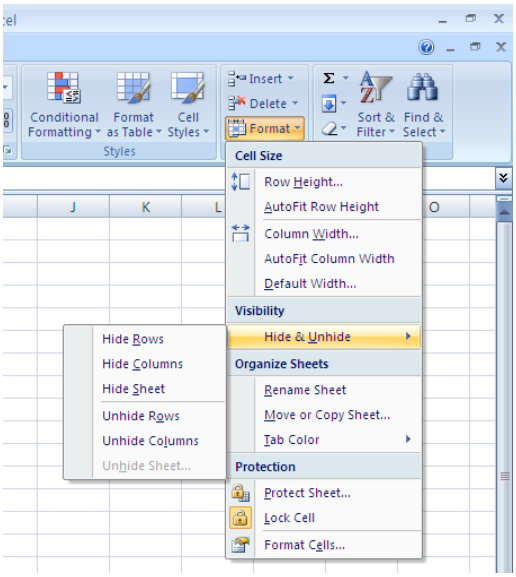
1. Move the pointer over the column separator line that is directly to the right of the column header where the hidden column should be (i.e. between column headers B and C).
2. Drag the column separator left until it is past the separator on its left.

To unhide a column using the mouse, follow these steps;

1. Move the pointer so that it's left edge touches the column separator on the right of a hidden column. The pointer changes to a two-headed pointer with space between the two heads.
2. Move the pointer so that its left tip touches the column separator.
3. Drag the column separator to the right, and then release.

To hide selected columns using the keyboard, follow these steps:

1. Select cells in the column you want to hide.
2. Choose **Home Format, Hide and Unhide** to obtain the following:



To reveal or unhide hidden columns, select cells (or columns) that span the hidden column; then choose **Home**, **Format, Hide and Unhide,** and then **Unhide Columns**.

Adjusting row height.

The procedure for changing the height of rows is similar to that for changing column widths. Remember that it is the line directly under the row header of the row you want to

change that is dragged. Also, row heights change automatically to accommodate the tallest font in the row.

Formatting a group of sheets in a workbook.

You can save time by formatting a group of sheets in a workbook. As you format the active sheet in the group, the formatting passes through to the same cells in the other sheets in the group. If you name range in the active sheet, the same name is applied to all the sheets in the group.

Before you can do group formatting you must select all the sheets in a workbook that will belong to the same group. To group sheets that are adjacent in a workbook, click the first sheet tab, and then scroll to display the last sheet tab and shift-click the last sheet tab. To group sheets that are not adjacent, click the first sheet tab, and then Ctrl-click all other sheets tabs you want selected. The title bar will now contain [Group]. All formatting you do on the active worksheet also applies to other sheets in the group. When you want to separate the group into individual sheets, click just one sheet's tab.

CHAPTER FIVE

PRINTING WORKSHEETS

Excel enables one to use the full capabilities of ones printer. Before you print a worksheet you must preview the document for a quick visual check on how the worksheet might look when printed on paper.

Printing a worksheet usually consist of the following steps.

1. Select the area to be printed.
2. Preview page breaks with **View, Page Break Preview** command, and set manual page breaks, if necessary, with the **Insert, Page Break** Command.
3. Choose **Microsoft Office button, Print, Print**.
4. Display the Printer drop-down list and select your printers. You only need to do this once unless you change printers.
5. Choose **File, Page Setup** to set margins, page orientation, print quality, headers and footers, page titles, and other option.
6. Choose, the Page Print Preview button to see how the printed document will appear.
7. While in the preview mode, print by choosing Print or at a later time, by using the **File, Print** command.

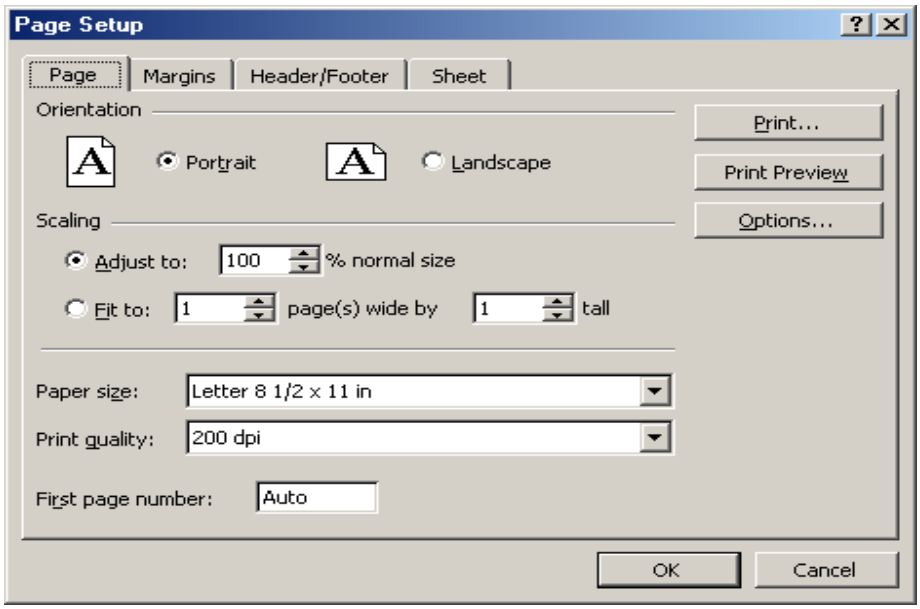
Defining the Page Setup.

All the settings one needs in order to print are usually found under the **Page Layout** menu. These include the position of print on the page, paper orientation (portrait or landscape), headers and footers, gridlines, colour or black and white, and rows and column headings.

Do the following to change the Page Set up for a page.

1. Choose **Page Setup**.

2. Change the page options as needed by clicking the appropriate tab in the Page Setup group or to obtain the page setup dialog box by



3. Choose the OK button after you have set the options.

The Page Setup dialog box has a number of tabs. These are the Page, Margins, Header/footer, and sheet tabs

The Page tabs – it enables you to select the paper size, the print quality, and the page orientation. It also enables you to reduce or enlarge the size of the report or sheet that you wish to print.

The margins tab – it enables you to set the top, bottom, left, and right margins for the page you wish to print. It also enables you to select how far from the top or bottom edge of the page. The default left and right margins are 0.75 of an inch while the default top and bottom margins are 1.0 of an inch. Headers and footers automatically print ½ inch from the top or bottom of the paper, unless you change the settings. The margins tab also enables you to select whether the printed page should be centred vertically or horizontally or both.

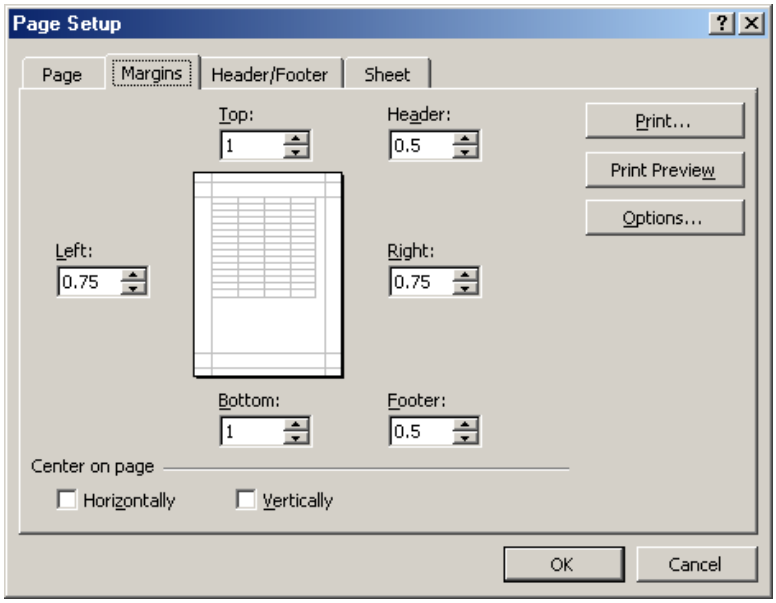
The Header / Footer tab – This tab enables you to choose the content of the headers and footers that are printed on each page. You may create custom headers and footers too.

T*he Sheet tab* – The print area, print titles, and the order in which pages are printed may be set under the sheet tab. Here you have the option to choose whether to print gridlines, comments, change colours to black and white, or print row and column headings. You can also choose to print in draft quality mode.

Setting Page margins

To set or change margins,

1. Select the margins tab in the Page Setup dialog box.



2. Set the margins options in any combination
3. Click the check box labelled Horizontally to centre the spreadsheet horizontally on the printed page if you wish.
4. Click the check box labelled vertically to centre the spreadsheet vertically on the Printed page if you wish. The preview area shows how the changes you make in the margins affect the printed page.
5. Finally, choose OK when you finish making the changes to the Page Setup options.

Setting Page Orientation and Paper Size.

If the spreadsheet document is wider than tall, you may want to use a landscape orientation when you print rather than a portrait orientation, which is taller than it is wide.

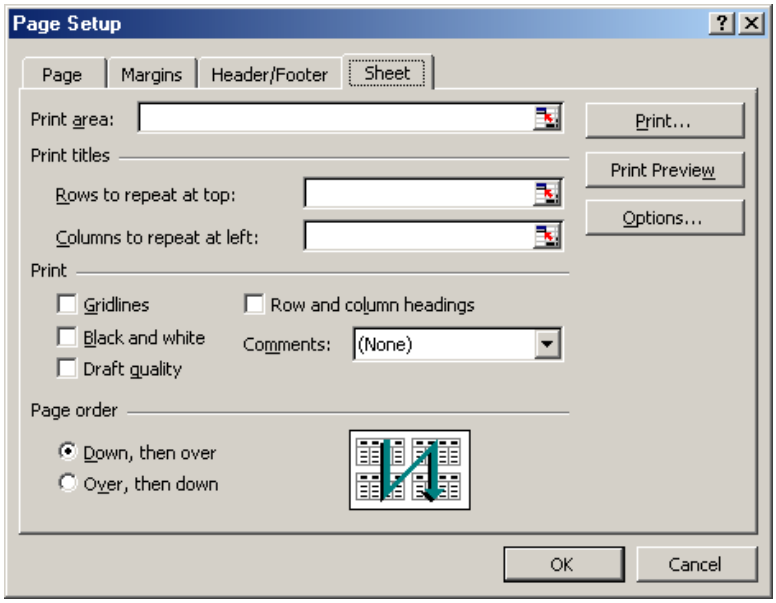
Also if your printer can handle different paper sizes, you may print on legal-sized paper (or some other size paper).

By selecting the Page tab in the Page Setup dialog box and selecting the desired paper size from the paper size drop-down list, you are able to change the paper size. The choice of paper sizes available to you depending on the printer you have selected.

Turning Gridlines and Rows or Columns Headings On or Off

Gridlines in the worksheet may be turned off by using the **Tools, Options,** command and clicking the View tab, and then clicking on the check box to show Gridlines. You also can turn on or off the printing of gridlines in the Page Setup dialog box. To turn on or off printing gridlines or row and columns headings, follow these steps;

1. Select the sheet tabs in the Page Setup dialog box.



2. Set or clears the Gridlines check box in the print area to turn on or off gridline Printing.
3. Set or clear the Rows and columns Headings printing to display or clear the row and column heading.

4 When you have finished making changes to the Page Setup options end the process by choosing OK.

Page Layout Order.

When Excel print a range that is too large to fit on one sheet of paper, it prints down the range, and then goes to the columns to the right of the first page and prints down those. In some cases – wide landscape reports, for example - you may want Excel to print across the wide range first and then move to the next lower area and then across it.

To select how you want Excel to print pages, select the Sheet tab in the Page Setup dialog box. From the Page order group, select either the Down, Then Over option or the Over, Then Down option.

Reducing and Enlarging Prints

If your printer supports scalable type or if you use True Type fonts, you can print a document proportionally reduced or enlarged. By making a proportional reduction, you can fit a document to a page without losing or redoing the formatting. To scale a document, select the Page tab in the Page Setup dialog box and select the Adjust To option or the Fit To option.

Use the Adjust To option to print the document at full size or to scale the document to a specified percentage of full size. Enter the desired size in the Adjust To text box. If you enter a number smaller than 100, the page is reduced to that percentage of the original. If you enter a number larger than 100, the page is enlarged. If the printer is incapable of scaling the print job to fit the page, the Adjust To and Fit To boxes are grey.

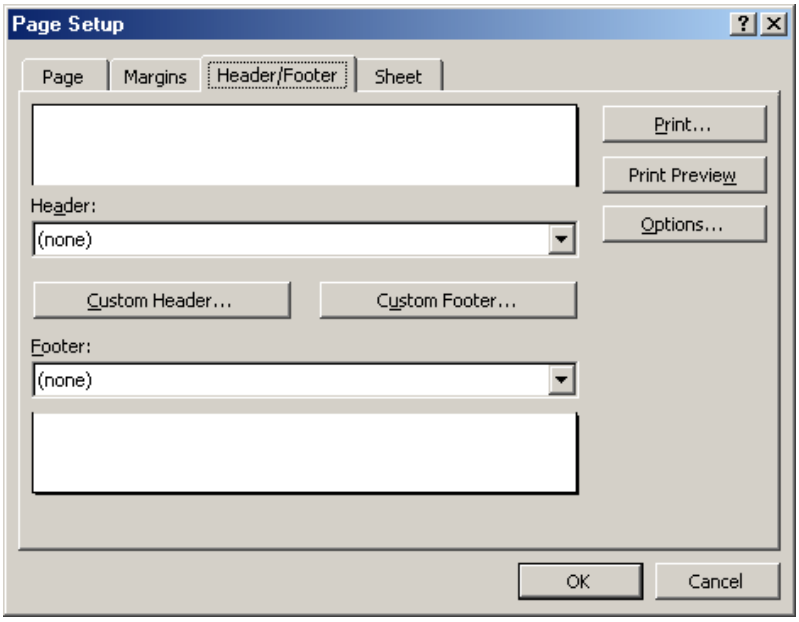
Use the Fit To option to tell Excel to scale the document to fit a specified number of pages. In the first text box in the Fit To option, inter the number of page widths you want the document fit to. In the second text box, enter the number of pages tall that you want the document fit to.

Creating Headers and Footers

You can create headers and/or footers that place a title, date, page numbers or text you want to print at the top or bottom of each printed page of your worksheet. You also can format them with different fonts, styles and sizes.

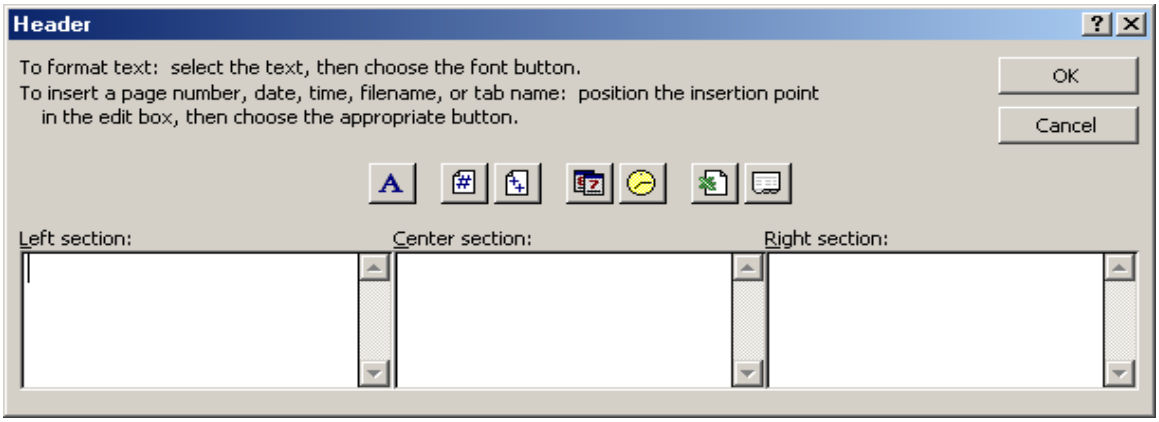
By defaults, Excel uses no header or footer. To create or change a header or footer, then follow these steps;

1. Open the Page Setup dialog box by choosing the **Home, Page Setup** command.
2. Select the Header/footer tab. A sample of the currently selected header and footer if any, is displayed.
3. Excel provides several predefined formats for the headers and footers. To selected one of the predefined header or footer format, use the Header or footer drop-down lists, and choose the desired format.



To create a custom header or footer, follow these steps;

1. Select the Header /Footer tab in the Page Setup dialog box to display the header and footer options.
2. Choose either Custom Header button or Custom Footer button to display the Footer or Header dialog boxes respectively, which are identical, except for their titles. The Header dialog box contains three sections for left-, centre-, or right- aligned data. You enter text or codes, such as the date code, into the three sections.



3. You can now enter text and code you want for each section of the header or footer. To enter information into a section with the mouse, click a section and type. You may also click a code button to enter a code at the insertion point. The code buttons appears above the three sections.

To enter information from the keyboard, press ALT + letter (the L,C, or R key) to move the insertion point into the corresponding section (left, centre, or Right). You may then type the text and/or codes or select code buttons by pressing Tab until the button is selected and then pressing Enter. You can create multiple-line header or footer by pressing ALT+Enter to break a line.

4. Finally, choose OK.

Setting the Print Range

By default, Excel prints the entire worksheet unless you specify otherwise. When you need to print only a portion of the worksheet, you must define that area by using either the **File, Page Setup** command or **File, Print Area** command. The print area can include more than one range.

To define print areas, follow these steps;

1. Choose File, Page Setup, and then select the sheet tab to display the sheet option in the Page Setup dialog box
2. Place the insertion point in the Print Area text box.

3. Select the range of cells you want to print. Click the Collapse Dialog box button to collapse the dialog box and make your selection, and then click the Expand Dialog button again to redisplay the dialog box. Excel enters the cell coordinates for the selected area in the print Area text box of the Sheet tab.
4. If there are any other Print areas to set up type a comma (,) in the Print Area text box, and select the next area you want to print. Select areas in the order that you want them to print.
5. When you have selected all the areas you want to print, choose OK.

After you set the print area, Excel marks the edges of the print area with dashed lines. Dashed lines also indicate manual and automatic page breaks. A page break indicates the bottom or right edge of the sheet of paper that the document prints on, and show you where a new printed page begins. Setting the print area creates a named range called the print Area.
To remove a print area, choose **File, Page Setup**, and select the Sheet tab to display the Sheet options. Delete all the text in the Print Area text box to print the entire document, or delete only the cell coordinates or the print area you want to remove. You can also choose **File, Print Area, Clear Print Area**.

Setting Manual Page Breaks

When you set manual page breaks, they override automatic page breaks and the automatic page breaks reposition automatically.

To insert manual page breaks, if you want to set vertical page breaks (that affects only the sides) make sure the active cell is in row 1 before you choose the **Insert, Page Break** command. If you want to set horizontal page breaks (the breaks for only the top and bottom of pages) move the active cell to the correct row in column A**.**

Place the active cell below the row you want the manual page break to appear or to the right of the column you want the manual page break to appear, and choose **Insert, Page Break.**

A manual page break stays at the location that you set until you remove it. To remove manual page breaks.
Move the active cell directly below or immediately to the right of the manual page break., (if the active cell appears), and then choose **Insert, Remove Page Break**.

To remove all manual page break at a go,
Select the entire document and choose the **Insert, Remove Page Break**.

Previewing the Document.

Instead of printing out your worksheet to check its appearance, you can view a display of the printout with miniature pages. When you want to examine a preview page closely, you can zoom into the area you want to see.
To preview pages, choose **File, Print Preview** or click the Print Preview button. The preview screen shows you how the pages will look when printed.

To zoom into a portion of the page, choose the zoom button or click the mouse pointer – magnifying glass over the portion that you want magnified. To zoom out, choose zoom a second time, or click a second time.

To change pages in the preview mode, use the Next or Previous buttons. These buttons appear greyed if there is no next or previous page. After you preview the worksheet, you can print it from the preview screen by choosing the print button.

If you want to change or see the Page Setup settings, choose the Setup button. To return to the worksheet, choose the Close button.

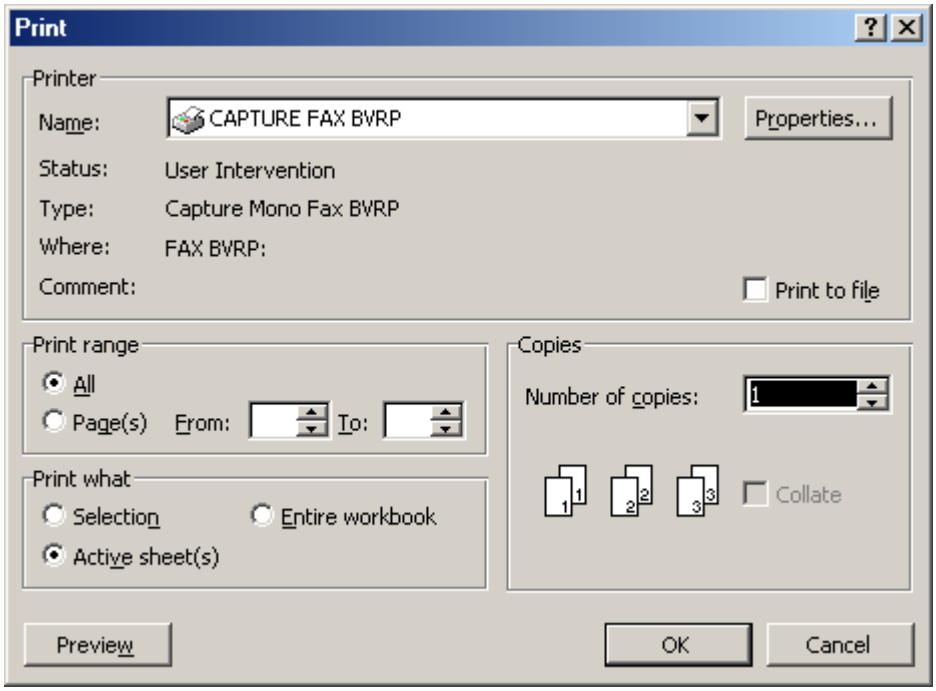
To adjust margins or column widths, follow these steps;

1. Choose the margins button. Column and margin markers appear on the preview page.
2. Drag the margin handles (black squares) or the dotted line to a better position.

3. Drag column handles (black Ts) or the column gridline to adjust column width.
4. Choose close to return to the document with these new settings, or choose Print to print the document with these settings.

Printing Worksheet Data

To print an Excel workbook, open the workbook you want printed, and then click the print button on the standard toolbar. This prints the active worksheets in the workbook. If you want more control over printing, click **File**, and then **Print** to display the print dialog box.



At the Print dialog box, the currently selected printer name displays in the Name text box. If other printers are installed, click the down – pointing triangle at the right side of the Name text box to display a list of printers to select from.

The Active sheet(s) option in the Print What section is selected by default. At this setting, the currently active worksheet will print. If you want to print an entire worksheet that contains several worksheets, click Entire workbook in the Print What section. Click the selection option in the Print what section to print the currently selected cells. If you

want more than one copy of a worksheet or workbook printed, change to the number of copies with the Number of copies option in the Copies section.
If you want to print specific pages of a worksheet within a workbook, click pages in the print range section, and then specify the desired page numbers in the From and To text boxes.

To print, choose the OK button. Make sure your printer is turned on or is on-line.

CHAPTER SIX

EXCEL FILES

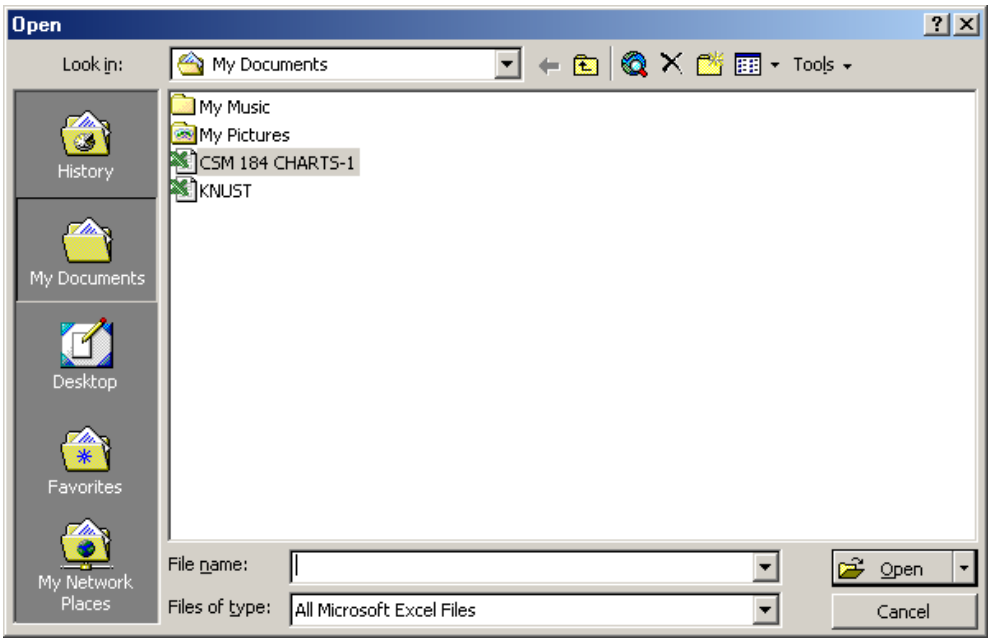
When you start Excel, the program opens with a blank workbook titled BooK1. Workbooks can contain one or more sheets of varying types. You can have, for example, worksheets, chart sheets, Macro sheets, etc, combined into a single workbook. The default workbook contains three worksheets. This number of sheets can however be changed.

In Excel, a file is the same as a workbook, so when you save or open a file in Excel, you are saving or opening a single workbook that may contain many sheets.

Opening an existing workbook

To open an existing workbook in order to continue working on a previously saved workbook, follow these steps;

1. Choose **Microsoft Office button and Open**, press Ctrl+O, or click the open button from the Quick Access toolbar. The Open dialog box appears.



When you choose **Office button, Open**, you may not be in the folder that contains the file you want. Change to the right folder by doing the following.

2. Open the drive and, if necessary change to the required drive by displaying the look In drop down list and select the drive you want from the list of drives that appears.

You may also open another folder and display files in that folder by double-clicking the folder icon. If the folder name isn't listed, use the up one level button to move up through the folder hierarchy level button to move up through the folder hierarchy until you display the folder icon you want.

3. You may then select the file you want to open and click open. As a shortcut, you can double-click the file name.

At the bottom of the File menu, Excel displays the names of the four most recently opening workbooks so that you can open these files quickly by clicking the file name without displaying the dialog box. Note that this action opens the file, but does not change the folder in which Excel is currently working.

Selecting Multiple Workbooks Simultaneously

To select files whose names are adjust, select the first file name, and then hold down the shift key as you click the last. Using the keyboard, press the up- or down – arrow to move to key boars, press the selected, them hold down the shift key as you move to the last file name. To select file whose names are not listed together, hold down the Ctrl key as you click each name.

Opening a Protected Workbook

Workbooks can have two types of protection. The password can protect the workbook against unauthorized opening, and another can protect against changes saved back to the original file. If the file you want to open is protected, you are prompted for the password. If it is protected against modification you will also be prompted for that password. Type

the password when prompted, using the exact upper- and lower case letters as the original passwords, and then choose OK.

Importing Files

By default, Excel files are listed in the open dialog box. You can limit the type of files that are displayed, and you can open several different types of files without having to go through a special conversion. Opening files created by other software other than Excel so that they can be worked on using Excel is known as importing files to Excel. The following types of files can be imported to Excel: Text, Lotus 1-2-3, Quattro Pro/DOS, Quattro Pro 1.0/5.0 (Win) micros, Works 2.0, Dbase, Excel 4 charts, Excel 4 macros, Excel 4 workbooks, Worksheets, Workspaces, Templates, HTML documents, etc.

To display and open other types of files in Excel, follow these steps;

1. Choose **Office button, Open**, press Ctrl+O or click the open button on the quick access toolbar.
2. In the Open dialog box change to the drive and folder that contains the files(s) you want to open.
3. Display the Type of Files drop-down list and select the type of file you want displayed. Excel lists only that type of file.
4. When you see the workbook listed, select it then choose the open button. Or as a Shortcut, you can double-click the name.

Also you can limit the types of files that are displayed by typing the file extension in the File Name text box. Some of the more frequently used file types that Excel read and their extensions are as follows.

File type	**Extension**
Excel workbook	XLS
Excel chart	XLC
Excel macro sheet	XLM
Text files (tab separated values)	TXT
Lotus 1-2-3 files	WK*

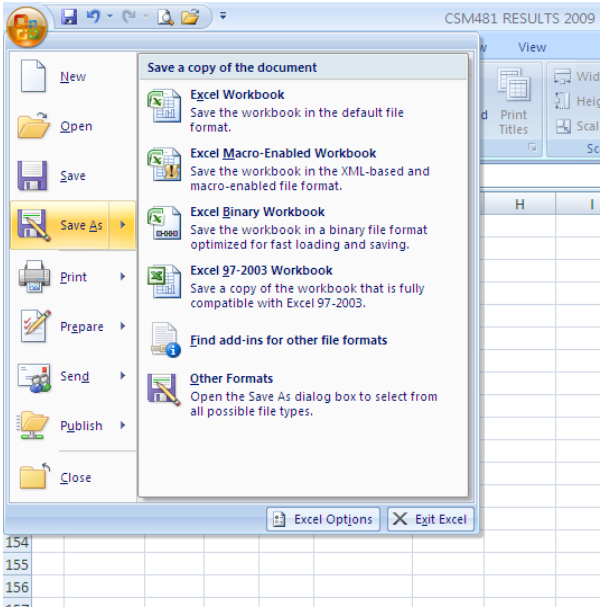
Dbase files DB*

Saving workbooks

You should get into the habit of saving your workbook every 10 to 15 minutes so that if your computer crashes or the power fails, (which is a common occurrence in Ghana), you lose a minimum amount of work. The previous work is replaced by the latest version if you save with the same filename. The file may be saved with a new file name using the **Save As** command. To save with the same file name as it already has, use the **Save** command. The steps for saving a worksheet are as follows:

Saving for the first time

1. Make the worksheet to be saved the active worksheet
2. Click **Office button** and then select **save as** or press F12 key to obtain the following:



3. Select the required option. Each option has a small narration telling you the use of the option.
4. Whichever of the first four options you select, you will obtain the save as dialog box to specify the name of the file, the path and other relevant information that you might to change. Complete the dialog box and click ok.

Saving an already Saved file

A worksheet that has been saved before need not necessary be saved again unless the content is modified and changes are necessary. To save such a file, you can either

- Click the **Office button** and select **Save**

Or - Click at the Save icon on the Quick Access toolbar

Or – Press Ctrl + S keys

File names

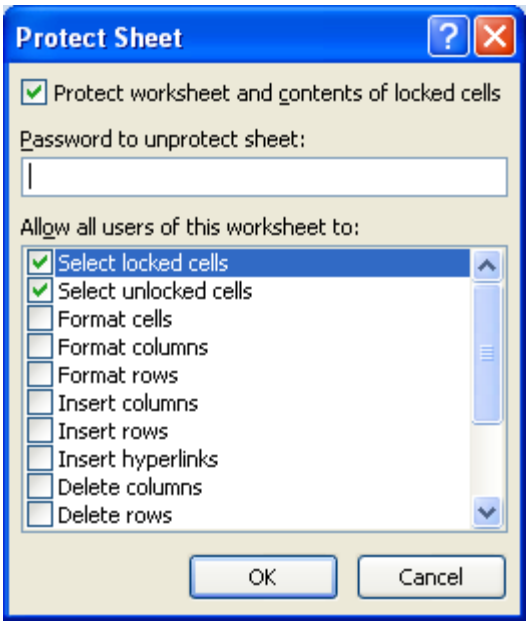
You need to give a name to a file (or workbook) the first time you save it. Windows 95 and newer Windows versions allow you to type up to 255 characters including spaces. However, you cannot use any of the following characters / ? : * ‘ < > !. You are not limited to old DOS rules for file names (8 characters, plus a three-character extension). Names that are longer than eight characters are converted to eight-character names when transferred to MS-DOS or earlier versions of windows.

Protecting Your Workbooks with a Password.

By saving workbooks with passwords, you can protect your workbook against unauthorized opening or changes to your workbook. To add protection to a file,

1. Choose **Review, Protect Workbook** or **Review, Protect sheet** to protect your workbook or to protect a sheet within a workbook respectively. To protect worksheet you can also use **Home, Format, Protect Sheet.**

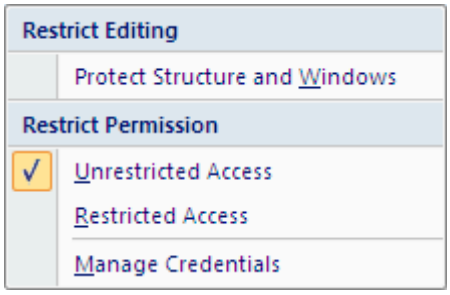
2. (i) If you choose to protect a **sheet** in step 1, you will obtain the following dialog box:



Type in your password (usually a good password is a combination of letters, special characters and digit of at least 6 characters long). Under the **allow all users of this worksheet to:** simply check or uncheck all that you will want to apply and click ok. You will then obtain the confirm password dialog box as follows:

Type in the same password you entered earlier and click ok.

(ii) If you selected **Protect Workbook** from step 1, you will be given the options to either Restrict Editing or to Restrict Permission as follows:



Choose the required option.

3. Save the document as explained above.

Note: When a worksheet is protected a user can only view the worksheet but cannot make any changes to the document unless one is able to provide the password placed on the document. If a workbook is protected, then you will need the required password to open the document each time the document is to be opened. Note also that to remove the password restriction on a worksheet, one will be required to enter the current password first.

Closing workbooks

To close the active workbook window,

. Choose **Office button, Close** or Click the document close button at the far right of the title bar. Using the keyboard, press Ctrl+F4 to close the workbook.

If you made changes since the last time you saved the workbook, an alert box appears. Choose **Yes** to save the workbook before closing.

The Open Dialog Box

Printing files from the Open dialog box

To print workbooks from the Open dialog box, follow these steps;

1. Select one or more files you want to print.

2. Choose the Command and Setting button and then the **Print** command from the submenu. Or right-click the selected files and choose Print. Excel opens the files, prints them, and then closes them.

Coping and Moving files using the Open dialog box

To copy or move files, follow these steps

1. In the Open dialog box, select one or more files you want to copy
2. Right-click the files and then choose Copy or Cut.
3. Display the drive or folder where you want to place the copy or move the file.
4. Right-click the drive or folder, and then choose Paste.

Files are copied to a new location with their original name and extension.

If you want to copy files to a floppy disk, select the files to copy and then right-click one of the files. From the submenu that appears choose Send To. Then choose the floppy disk drive.

Deleting files using the Open dialog box

To delete files, follow these steps.

1. In the open dialog box select the files you want to delete.
2. Right-click the selected files(s) and choose **Delete**. A dialog box asks you to confirm the move to the Recycle Bin.
3. Choose **Yes** to delete the files, or choose **No** If you don't want to erase them.

Changing the Default Number of Sheets in New Workbooks

The default number of sheets in a new workbook is three. To change the number of sheets in a new workbook, follow these steps;

1. Choose **Tools, Options** to display the options dialog box.
2. Select the General tab.
3. Select the Sheets In New Workbook option
4. Choose OK.

Inserting and Deleting Worksheets

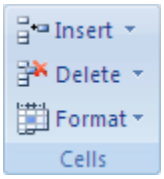
By default, Microsoft Excel provides three worksheets. A worksheet consists of cells that are organized into columns and rows; a worksheet is always stored in a workbook. The name of a worksheet appears on its sheet tab at the bottom of the screen. By default, the name is Sheet1, Sheet2 and Sheet3. The next sheet to be added will be Sheet4 and so on, but you can give any worksheet a more appropriate name.

Insert a new worksheet

To insert a new worksheet, do one of the following:

To quickly insert a new worksheet at the end of the existing worksheets, click the **Insert Worksheet** tab at the bottom of the screen.

To insert a new worksheet before an existing worksheet, select that worksheet, and then on the **Home** tab, in the **Cells** group, click **Insert**, and then click **Insert Sheet**.

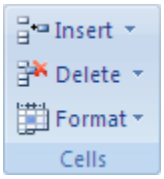


You can also right-click the tab of an existing worksheet, and then click **Insert**. On the **General** tab, click **Worksheet**, and then click **OK**.

Insert multiple worksheets at once

If it is necessary to insert more than one sheet, the rather than inserting them one at a time, you can insert the number of sheets required at the same time by following the steps below:

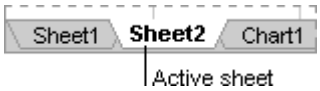
1. Hold down SHIFT, and then select the same number of existing sheet tabs of the worksheets that you want to insert in the open workbook.
   For example, if you want to add three new worksheets, select three sheet tabs of existing worksheets.
2. On the **Home** tab, in the **Cells** group, click **Insert**, and then click **Insert Sheet**.



You can also right-click the selected sheet tabs, and then click **Insert**. On the **General** tab, click **Worksheet**, and then click **OK**.

Rename a worksheet

1. On the **Sheet tab** bar, right-click the sheet tab that you want to rename, and then click **Rename**.



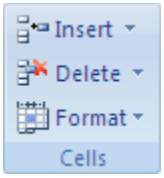
2. Select the current name, and then type the new name.

When printing a worksheet, you can ask Excel to print the names of the sheets after going through the following steps:

1. On the **Insert** tab, in the **Text** group, click **Header & Footer**.
2. In the **Page Layout View**, click the location where you want the sheet name to appear.
3. In the **Header & Footer elements** group, click **Sheet Name** .

Delete a worksheet

- On the **Home** tab, in the **Cells** group, click the arrow next to **Delete**, and then click **Delete Sheet**.



You can also right-click the sheet tab of the worksheet that you want to delete, and then click **Delete**.

Consolidating (or combining) Data from Several Worksheets

Data from several worksheets in one workbook or from different workbooks can be consolidated on a separate master worksheet. When one consolidates worksheets, one is simply assembling data so that it can easily be updated on a regular basis.

Suppose you have the sales figures for 5 salespersons for each of the months January, February and March. Each Salesperson sells three different products-Batik, Kente, and Dumas as illustrated below for January.

January.

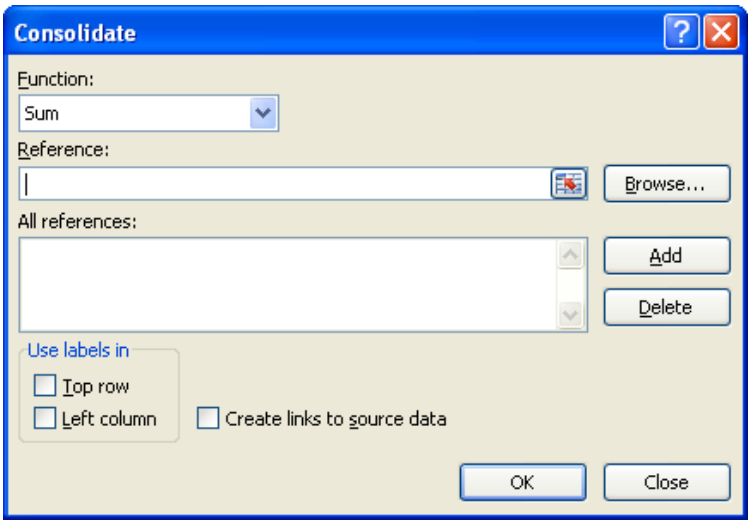
	Batik	Kente	Dumas
Kofi	560000	900000	1600000
Ama	450000	2500000	1200000
Osei	600000	1800000	950000
Afua	920000	320000	500000
Kwabena	70000	950000	590000

Data from January, February and March can be consolidated to produce a new worksheet that shows the sales figures for the first quarter of the year.

To consolidate the data, follow these steps;

1. Select a destination range. You may just click and select cell A1 in your destination worksheet.
2. Choose **Data, Consolidate** from the **Data Tools**.

   The consolidate dialog box appears as follows:



1. Select the Reference text box and type a source area or select by clicking the collapse Dialog button at the end of the Reference text box to collapse the dialog box and select a source area. Click the Expand dialog box button to redisplay the dialog box.

2. Choose the Add button to add the source entry to the All References list.
3. Repeat steps 3 and 4 to add all the source areas to the All Reference List.
4. From the function drop down menu pick the function you want to perform on the consolidated data e.g. Sum.
5. If the physical layouts of the source worksheets are identical, Excel can consolidate by position. In this case, clear the Top Row and Left Column options in the consolidate dialog box.

   OR

   If the physical layouts are different, Excel can use row and column headings to consolidate the data. In this case select the Top Row and Left Column options.
6. Select what you want the destination area to contain: fixed values that do not change or links that update when the source change.

CHAPTER SEVEN

CREATING CHARTS (GRAPHS)

The graphics feature of Excel allows you to display your workbook information in a format that is easy to interpret. While a worksheet does an adequate job of representing data, you can present some data more visually by charting the data. Charts summarize the essence of your data, so that you can focus on general patterns and trends. A chart is sometimes referred to as a graph and is a picture of numeric data.

Excel creates charts from data you select. You can use the Chart Wizard to guide you through the process of creating a chart step-by-step or you can customize your chart by using the many chart commands.

In many cases, Excel can draw a chart for you from data you select. To draw the chart, Excel uses certain rules based on how the data is configured. The orientation of the data determines which cells are used for the category axis, (the labels along the bottom of x-axis) and which cells are used for the legend labels. In most cases, the rules fit standard data layout, so Excel charts come out correctly without intervention from you. However if not, then you can change the chart by specifying your own parameters to override Excel's choices.

Charts may be embedded in a worksheet or in its own chart sheet. In either case the chart is linked to the data from which it was created; if the data changes, the chart is automatically updated.

CHART TERMS AND/OR OBJECTS

Excel charts contain many objects that you can select and modify individually.
When you move your mouse over an object in a chart, a tip appears that identifies the chart object or displays the series and value if the object is a data point. The diagram below shows some of these objects.

Axis - Form the boundaries of chart and contains the scale against which data plots.

Chart Wizard button - Starts the Chart Wizard, which guides you through the creation of a chart step-by-step.

Data Point - A single piece of data, such as sales for one year.

Data Series - A collection of data points.

Legend - A guide that explains the symbols, patterns, or colors used to differentiate data series. The name of each data series is used as a legend title.

Marker - An object that represents a data point in a chart. Bars, symbols, colors, etc are examples of markers.

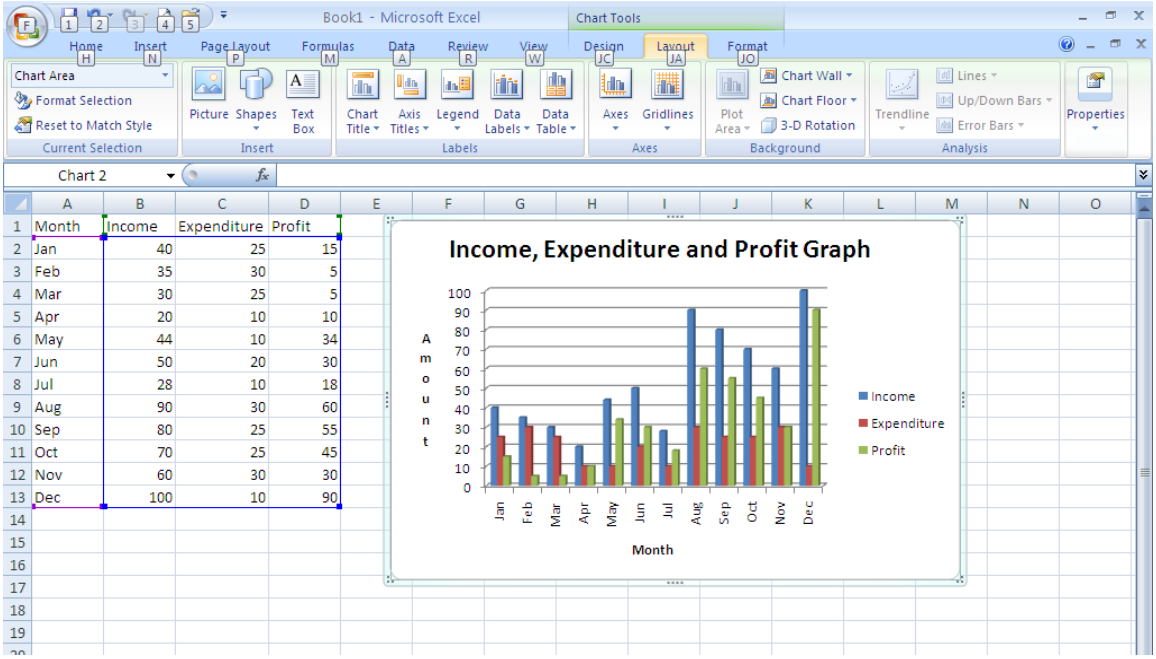
Plot Area - The rectangular area bounded by the two axes.

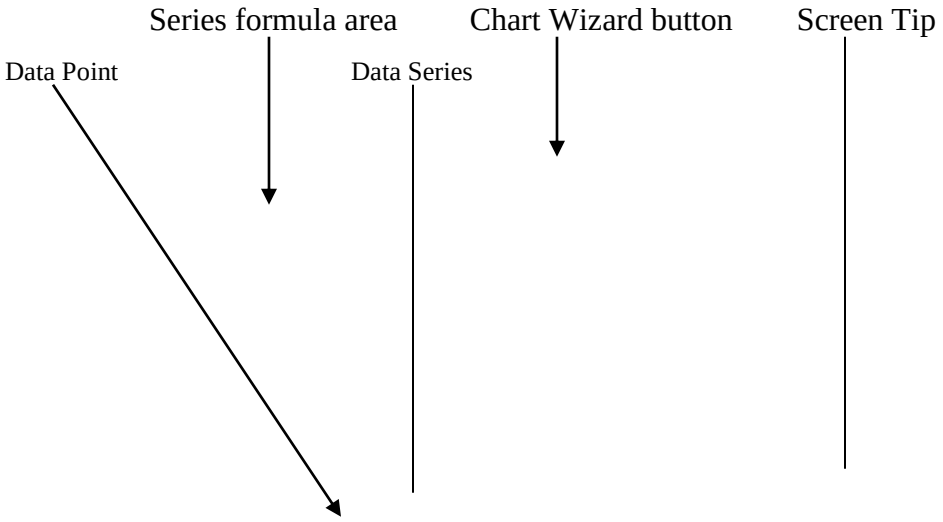
Series formula - An external formula that tells Excel where to look on a specific worksheet to find the data for a chart. You can link a chart to multiple worksheets.

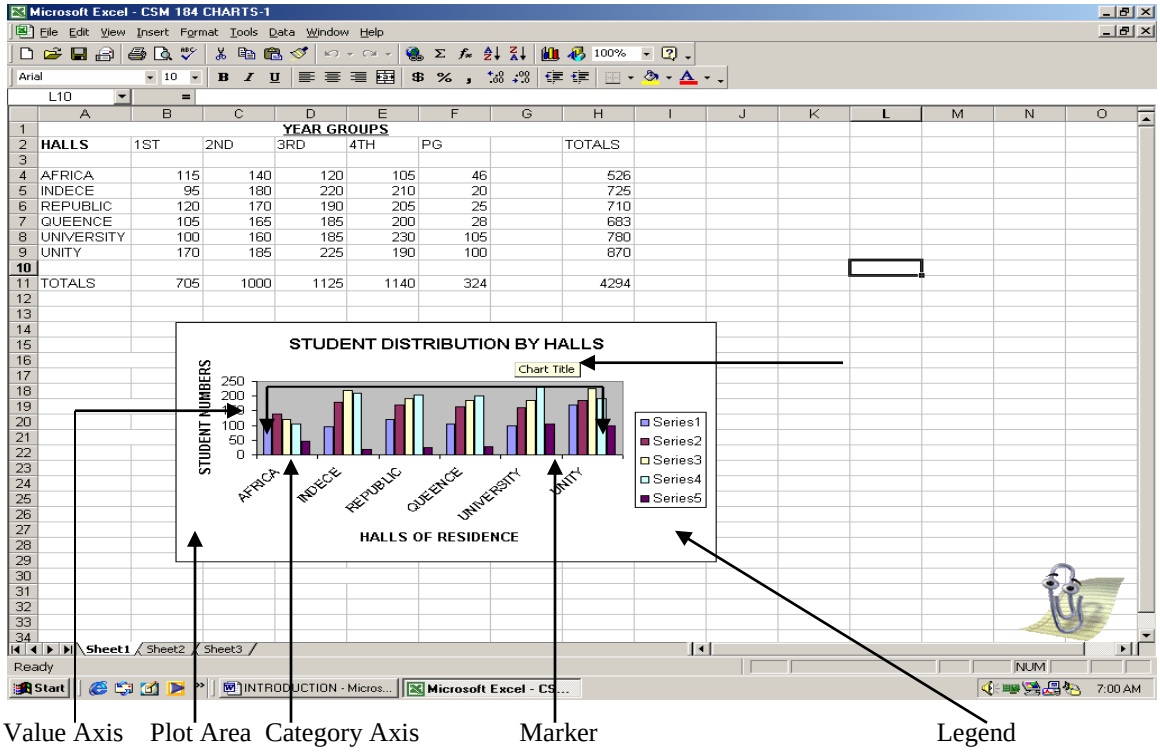
Tick mark - A division mark along the category(x) and value (Y and Z) axes.

Toolbar - A special toolbar is available with charting tools.

Tip - A box that identifies the object that the mouse pointer is pointing to.


Book1 - Microsoft Excel
Chart Tools
Home
Insert
Page Layout
Formulas
Data
Review
View
Design
Layout
Format
Chart Area
Format Selection
Reset to Match Style
Current Selection
Picture
Shapes
Text Box
Insert
Chart Title
Axis Titles
Legend
Data Labels
Data Table
Labels
Axes
Gridlines
Axes
Plot Area
Chart Wall
Chart Floor
3-D Rotation
Background
Trendline
Lines
Up/Down Bars
Error Bars
Analysis
Properties
Chart 2
Month
Income
Expenditure
Profit
Jan 40 25 15
Feb 35 30 5
Mar 30 25 5
Apr 20 10 10
May 44 10 34
Jun 50 20 30
Jul 28 10 18
Aug 90 30 60
Sep 80 25 55
Oct 70 25 45
Nov 60 30 30
Dec 100 10 90
Income, Expenditure and Profit Graph
Amount
Month
Income
Expenditure
Profit


Series formula area
Chart Wizard button
Screen Tip
Data Point
Data Series



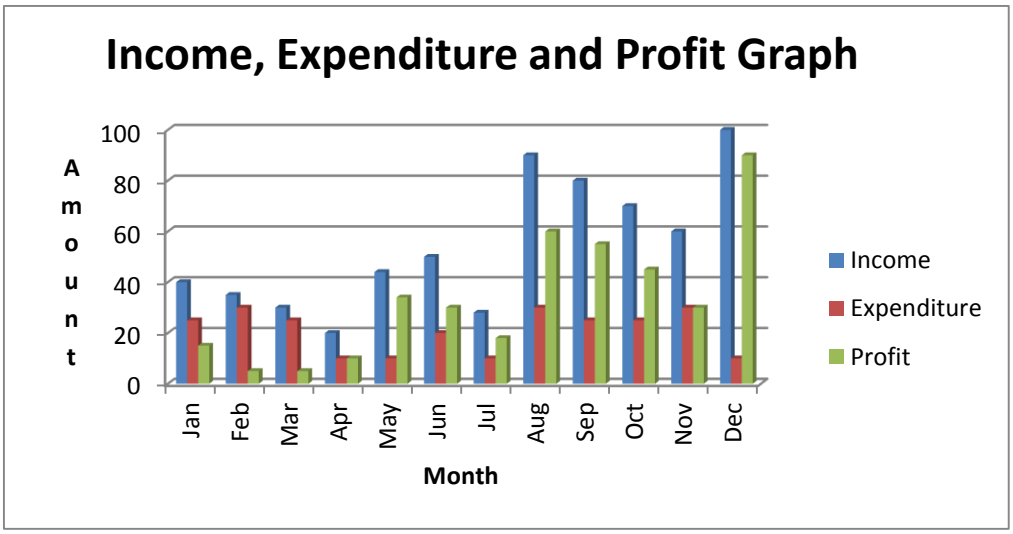
STANDARD CHART TYPES

Excel has **14 chart types**. Each of these chart types has several sub-types. Many of the chart types have 3-D sub-types. They are used to add visual depth and impact to the presentation of your data.

Column charts

When you have data that is arranged in columns or rows on a worksheet they can be plotted in a column chart. Column charts are useful for showing data changes over a period of time for illustrating comparisons among items.

In column charts, categories are typically organized along the horizontal axis and values along the vertical axis.



Column charts have the following chart subtypes:

Clustered column and clustered column in 3-D. Clustered column charts compare values across categories and the chart displays values in 2-D vertical rectangles. A clustered column in 3-D chart displays just the vertical rectangles in 3-D format and does not display the data in 3-D format.

Stacked column and stacked column in 3-D: Stacked column charts show the relationship of individual items to the whole by comparing the contribution of each value to a total across categories. A stacked column chart displays values in 2-D vertical stacked rectangles. A 3-D stacked column chart displays the vertical stacked rectangles in 3-D format but does not display the data in 3-D format. This type of chart is more useful when you have multiple data series and when you want to emphasize the total.

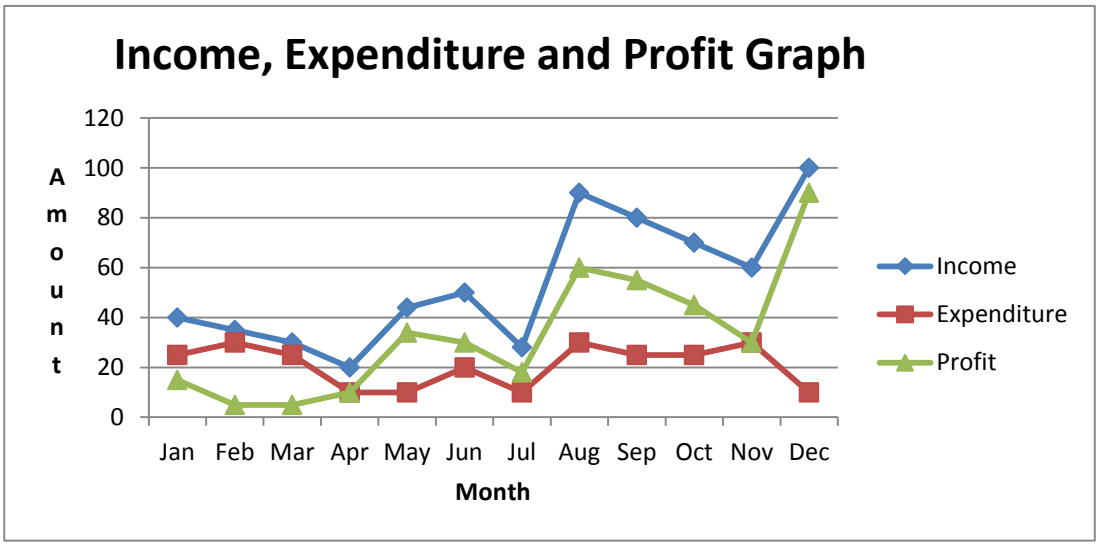
100% stacked column and 100% stacked column in 3-D: These types of column charts compare the percentage each value contributes to a total across categories. You can use a 100% stacked column chart when you have three or more data series and you want to emphasize the contributions to the whole.

3-D column: 3-D column charts use the three axes that you can modify to compare data points along the horizontal and the depth axes.

Cylinder, cone, and pyramid: Cylinder, cone, and pyramid charts are used to show and compare data exactly the same way. The main difference between these is that they display cylinder, cone, and pyramid shapes instead of rectangles.

Line charts

Data arranged in columns or rows on a worksheet can be plotted in a line chart. Line charts can display continuous data over time and are therefore best for showing trends in data at equal intervals. In a line chart, category data and the value data are distributed evenly along the horizontal and the vertical axes respectively.



Use a line chart if your category labels are texts that represent evenly spaced values such as days, months, quarters, or years. Line chart is also best used when you have a few evenly spaced numerical labels, especially years. If you have more than ten numerical labels then a scatter chart is preferred.

Line charts have the following chart subtypes:

Line and line with markers: Line charts can be displayed with or without markers to indicate individual data values. If there are many data points and the order in which they are presented is important then line charts are more useful as they show trends over time or ordered categories. If there are many categories or the values are approximate, then markers should not be used.

Stacked line and stacked line with markers: Stacked line charts are useful to show the trend of the contribution of each value over time. If there are many

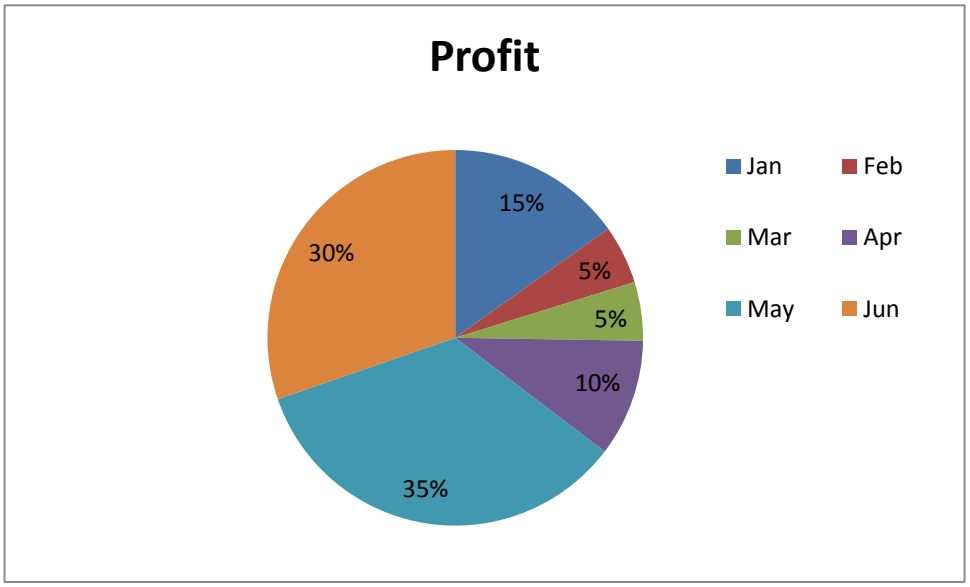
categories or the values are approximate then use a stacked line chart without markers.

100% stacked line and 100% stacked line with markers: The 100% stacked line charts are useful to show the trend of the percentage each value contributes over time. If there are many categories or the values are approximate then use a 100% stacked line chart without markers.

3-D line: The 3-D line charts show each row or column of data as a 3-D ribbon.

Pie charts

Data arranged in only one column or row on a worksheet can be plotted in a pie chart. Pie charts show the size of items in one data series. The data points in a pie chart are displayed as a percentage of the whole pie.



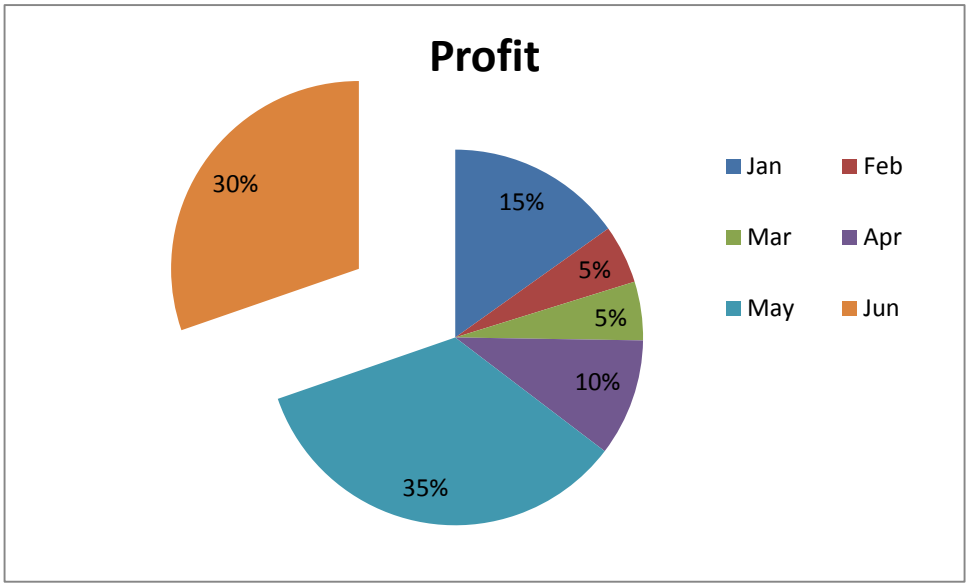
Pie charts have the following chart subtypes:

Pie and pie in 3-D: Pie charts display the contribution of each value to a total in either 2-D or 3-D format.

Pie of pie and bar of pie: Pie of pie or bar of pie charts display pie charts with user-defined values extracted from the main pie chart and combined into a second pie or into a stacked bar. These chart types are useful when you want to make small slices in the main pie easier to see.

Exploded pie and exploded pie in 3-D: Wedges in pie charts can be pulled out or "exploded" from the pie to emphasize the data point they represent. To "explode" or pull

out a slice, click the slice once to select the whole chart, and then click a second time to select the individual slice. Drag the slice away from the pie and release the button when slice is positioned. In the figure below, the June slice (30%) has been exploded from the rest.



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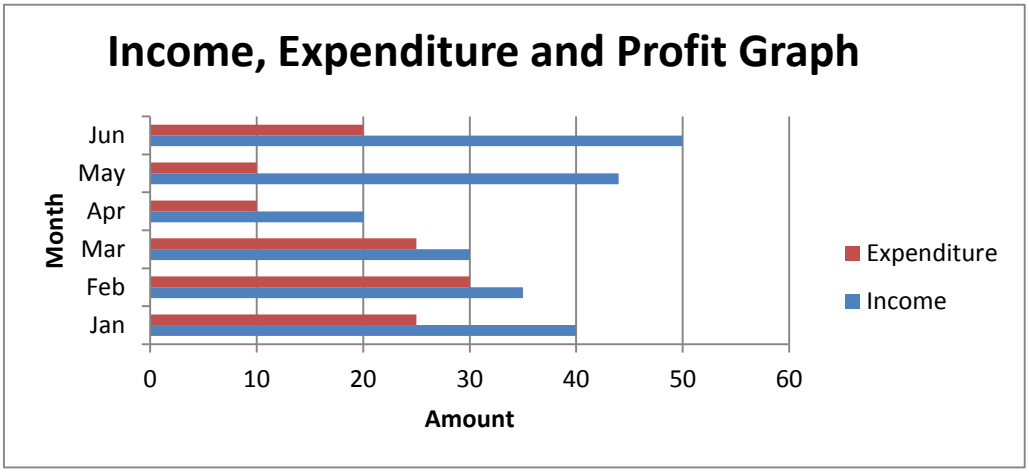
Bar charts

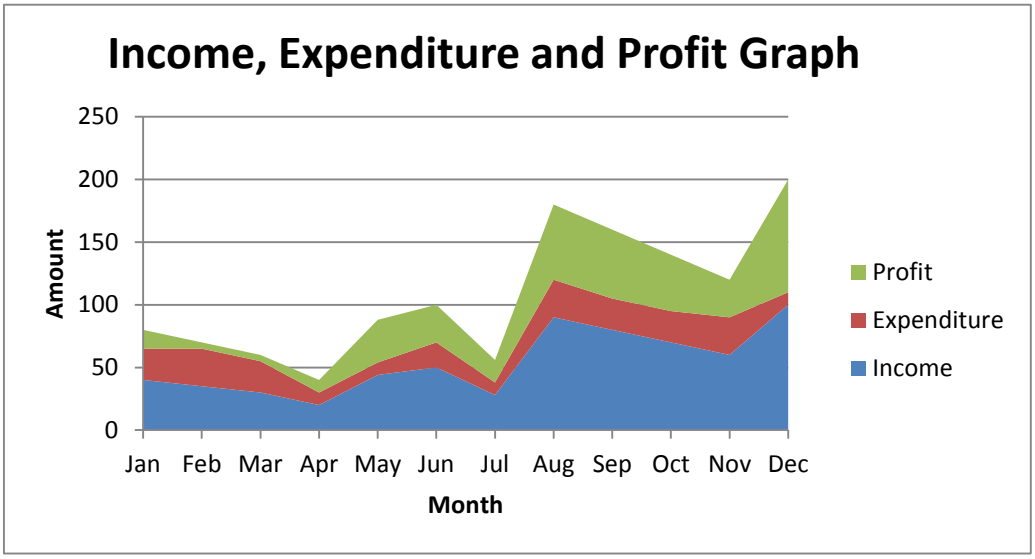
Data arranged in columns or rows on a worksheet can be plotted in a bar chart. Bar charts show comparisons among individual items.



Bar charts have the following chart subtypes: **Clustered bar and clustered bar in 3-D, Stacked bar and stacked bar in 3-D, 100% stacked bar and 100% stacked bar in 3-D, Horizontal cylinder, cone, and pyramid.**

Area charts

Data arranged in columns or rows on a worksheet can be plotted in an area chart. Area charts highlight the magnitude of change over time to draw attention to the total value across a trend.



Area charts have the following chart subtypes: **Area and area in 3-D, Stacked area and stacked area in 3-D, 100% stacked area and 100% stacked area in 3-D,** and **3-D area.**

XY (scatter) charts

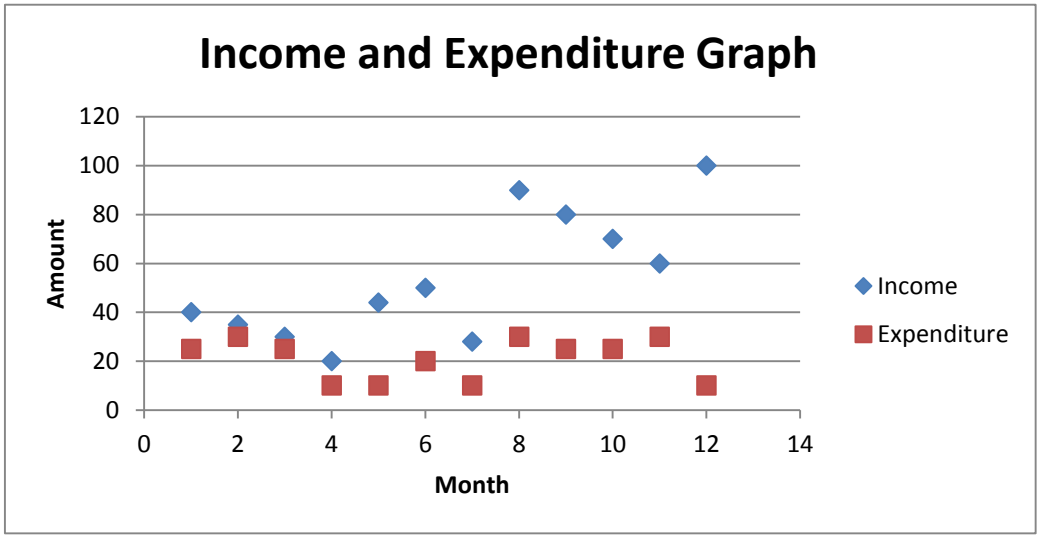
Data arranged in columns and rows on a worksheet can be plotted in an xy or scatter chart. Scatter charts show the relationships among the numeric values in several data series, or plots two groups of numbers as one series of xy coordinates.

Generally, a scatter chart has two value axes, one shows numerical data along the horizontal axis (x-axis) and the other along the vertical axis (y-axis). Scatter charts are commonly used for displaying and comparing numeric values, such as scientific, statistical, and engineering data.

Consider using a scatter chart when:

- Values for horizontal axis are not evenly spaced.
- There are many data points on the horizontal axis.
- You want to show similarities between large sets of data instead of differences between data points.
- You want to compare large numbers of data points without regard to time—

To arrange data on a worksheet for a scatter chart, you should place the x values in one row or column, and then enter the corresponding y values in the adjacent rows or columns.



Scatter with only markers: This type of chart compares pairs of values. Use a scatter chart without lines only when you have data in a specific order.

Scatter with smooth lines and scatter with smooth lines and markers: This type of chart can be displayed with or without a smooth curve connecting the data points. These lines can be displayed with or without markers. Use the scatter chart without markers if there are many data points.

Scatter with straight lines and scatter with straight lines and markers: This type of chart can be displayed with or without straight connecting lines between data points. These lines can be displayed with or without markers.

Doughnut Charts

This is similar to pie charts. It enables you to show more than one data series.

Other chart types are Radar, Surface, Bubble, and Stock charts. They can be of Cylinder, Cone or Pyramid sub-types in order to add visual impact to your charts.

CREATING A CHART USING

To create a chart follow these steps:

1. Select the data you want to chart. Include the row and column headings if you want them to appear in the chart as category and legend labels.
2. Choose **Insert**
3. From the Chart group, decide on the type of chart you want and pull that chart type down.
4. Select from the different formats of the chart type selected in step 3 by clicking your choice of format.
5. To add labels such as chart title, axes, etc, click to select the graph you just created. Click at the **layout button** to get the various labels that can be added or changed.
6. Select the type of label to add from the **labels** group of **layout**.
7. Select appropriate options and add the required labels.

CREATING A CHART AUTOMATICALLY

If data is in a layout that Excel can interpret, you need only select the data and press F11 (or Alt+F1 if you don't have F11 key) to create a chart. Excel plots the data in the preferred chart type; the default is the 2-D column chart.

Rules that Excel follows

1. Excel assumes that the category (X) axis runs along the longest side of the selection. If the selection is square or wider than it is tall, then Excel assumes that the category (X) label run across the top row of the selection.
   If the selection is taller than wider, it assumes that the category (X) labels run down the left column of the selection.
2. Excel also assumes that labels in cells along the short side of the selection should be used as titles in the legend for each data series. If only one data series exists, Excel uses this label to title the chart. If more than one data series is selected, Excel uses the labels in these cells to title the legend.

3. If the contents of the cells that Excel wants to use as category labels are numbers (not text or dates), Excel assumes that these cells contain a data series and plots the graph without category (X) labels, numbering each category instead.
4. If the contents of the cells that Excel wants to use as series labels are numbers (not text or dates), then Excel assumes that these cells are the first data points in each of the data series and assigns the names Series 1, Series 2, and so on to each of the data series.

WHAT HAPPENS TO GRAPHS WHEN WORKSHEET VALUES CHANGE

You may probably be wondering what will happen to your graph should you decide to change some of the data values from which the graph was produced. Will you have to redefine your graph again? The answer is NO. When a worksheet value is changed, the corresponding graph is automatically updated. Hence one need not worry about changes in worksheet. This is true when the graph is named and not when it is saved or printed. The only time you may have to change your graph settings (especially the X and Y axes range) is when the X and/or the Y axis data range is either increased or decreased. That is if more data values are added to or removed from a range. The other situations that may call for redefining graph is when columns are either inserted or deleted such that some of the data ranges changes column or rows.

SAVING CHARTS

A chart that you embedded in a worksheet is saved when you save the workbook that contains the worksheet. A chart in its own sheet also is saved when you save the related workbook.

PRINTING CHARTS

Size charts before printing by using **File, Page Setup** or choose the Setup button on the **File, Print Preview** dialog box and select the Margin tab to display the dialog box. You can change margins in the File, Print Preview dialog box by dragging the margin lines to a new setting.

To preview your chart before printing or to use the mouse to visually adjust chart size or margins,

1. Choose **File, Print Preview**.
2. Examine detail and positioning on the chart by zooming in or out on the page. To Zoom in, place pointer (magnifying glass symbol) over area of interest and click. Click the zoomed page to return to the expanded view. Choose the button to zoom and unzoom when using the keyboard.
3. Select Setup button to return to the Page Setup dialog box. To expand by height and width, select chart tab and then select the Use Full Page option from the Page Setup dialog box.
4. Choose OK.
5. Adjust the margins and size of the chart by clicking the Margins button. To change margins and to change the chart size, drag the black handles.
6. To display the Print dialog box, choose Print. To return to the Chart document, choose Close.

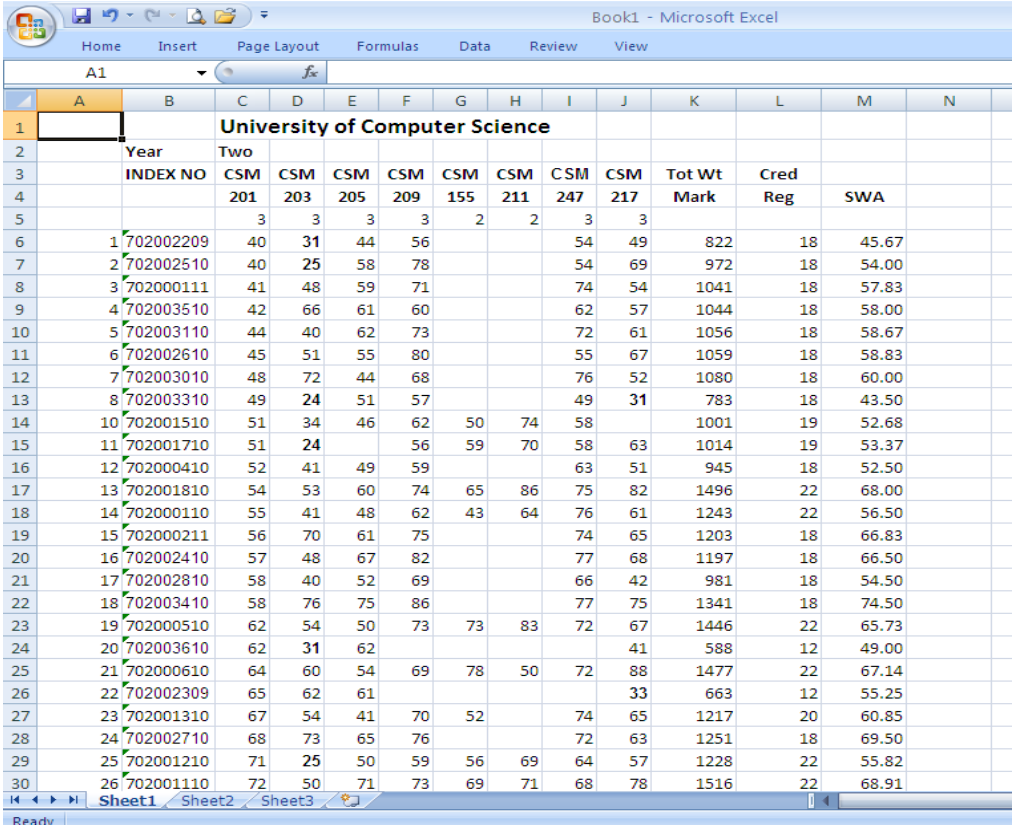
To print the chart from the worksheet choose **File, Print** (or press Ctrl +P) and complete the dialog box. Follow the same procedure as you follow for printing worksheets.

SORTING AND FILTERING DATA

SORTING

One of the common data processing operations that is performed by the Computer is SORTING. Sorting is the process of arranging data in numerical or alphabetical order. The order of the arrangement may be ascending or descending order. To sort, each row of a worksheet form a record (information about a particular person, city, products, etc) and each column forms a field. =

Let us consider the following worksheet:

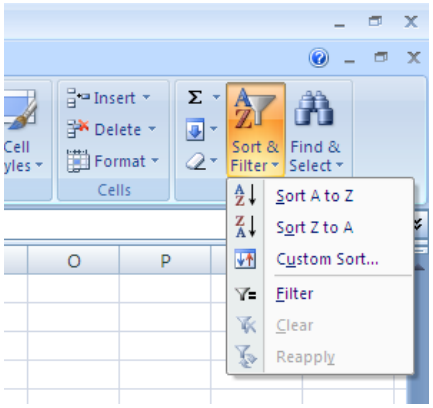


1			University of Computer Science										
2		Year	Two										
3		INDEX NO	CSM	CSM	CSM	CSM	CSM	CSM	CSM	CSM	Tot Wt	Cred	
4			201	203	205	209	155	211	247	217	Mark	Reg	SWA
5			3	3	3	3	2	2	3	3			
6	1	702002209	40	31	44	56			54	49	822	18	45.67
7	2	702002510	40	25	58	78			54	69	972	18	54.00
8	3	702000111	41	48	59	71			74	54	1041	18	57.83
9	4	702003510	42	66	61	60			62	57	1044	18	58.00
10	5	702003110	44	40	62	73			72	61	1056	18	58.67
11	6	702002610	45	51	55	80			55	67	1059	18	58.83
12	7	702003010	48	72	44	68			76	52	1080	18	60.00
13	8	702003310	49	24	51	57			49	31	783	18	43.50
14	10	702001510	51	34	46	62	50	74	58		1001	19	52.68
15	11	702001710	51	24		56	59	70	58	63	1014	19	53.37
16	12	702000410	52	41	49	59			63	51	945	18	52.50
17	13	702001810	54	53	60	74	65	86	75	82	1496	22	68.00
18	14	702000110	55	41	48	62	43	64	76	61	1243	22	56.50
19	15	702000211	56	70	61	75			74	65	1203	18	66.83
20	16	702002410	57	48	67	82			77	68	1197	18	66.50
21	17	702002810	58	40	52	69			66	42	981	18	54.50
22	18	702003410	58	76	75	86			77	75	1341	18	74.50
23	19	702000510	62	54	50	73	73	83	72	67	1446	22	65.73
24	20	702003610	62	31	62					41	588	12	49.00
25	21	702000610	64	60	54	69	78	50	72	88	1477	22	67.14
26	22	702002309	65	62	61					33	663	12	55.25
27	23	702001310	67	54	41	70	52		74	65	1217	20	60.85
28	24	702002710	68	73	65	76			72	63	1251	18	69.50
29	25	702001210	71	25	50	59	56	69	64	57	1228	22	55.82
30	26	702001110	72	50	71	73	69	71	68	78	1516	22	68.91

Let us sort the records into ascending number of index numbers. The needed steps will be as follows:

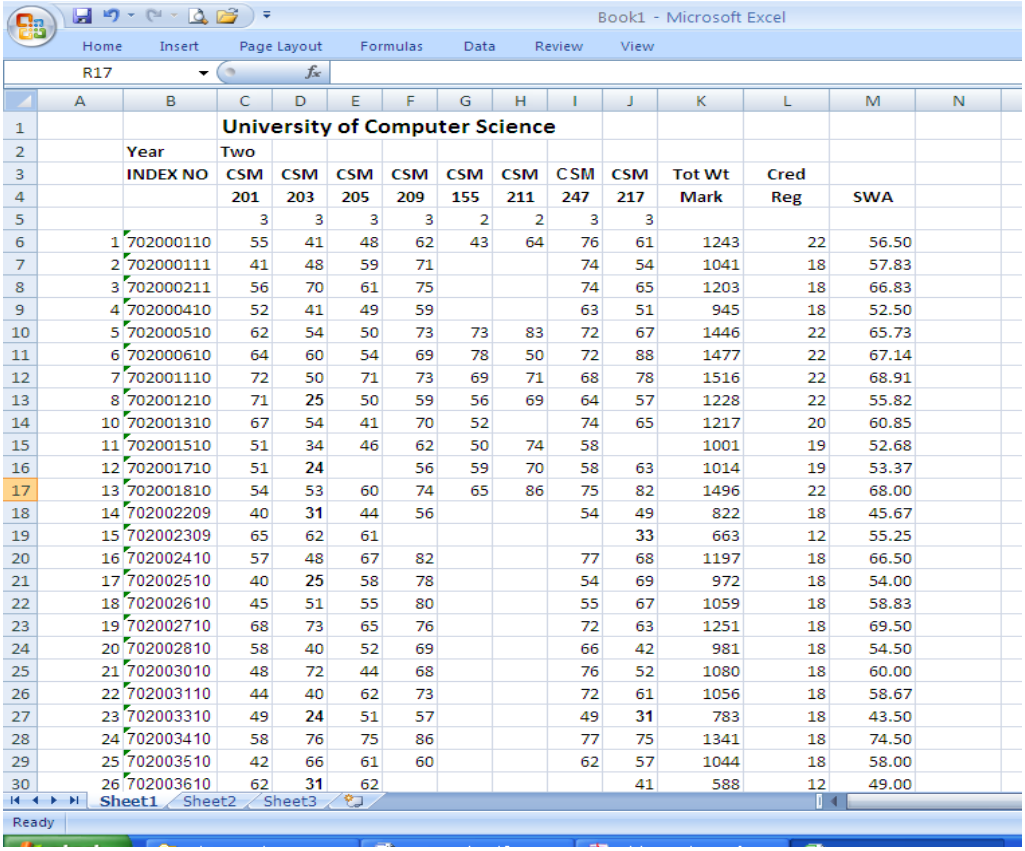
1. Select cells B6 to M30

2. From the **Home** menu, select **Sort & Filter** from the **Editing** group. You will obtain the following figure



3. To sort into ascending order of the index no Select **Sort A to Z** and into descending order you will select **Sort Z to A**.

Assume you selected from step 3 Sort A to Z then your worksheet will appear as follows:

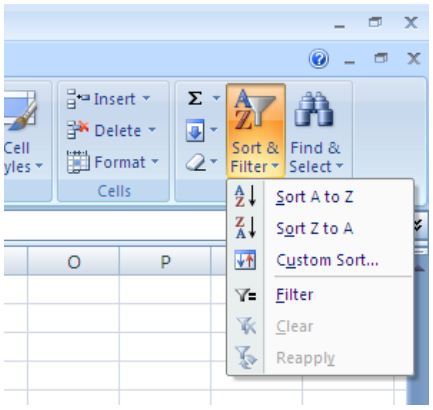


1			University of Computer Science										
2		Year	Two										
3		INDEX NO	CSM	CSM	CSM	CSM	CSM	CSM	CSM	CSM	Tot Wt	Cred	
4			201	203	205	209	155	211	247	217	Mark	Reg	SWA
5			3	3	3	3	2	2	3	3			
6	1	702000110	55	41	48	62	43	64	76	61	1243	22	56.50
7	2	702000111	41	48	59	71			74	54	1041	18	57.83
8	3	702000211	56	70	61	75			74	65	1203	18	66.83
9	4	702000410	52	41	49	59			63	51	945	18	52.50
10	5	702000510	62	54	50	73	73	83	72	67	1446	22	65.73
11	6	702000610	64	60	54	69	78	50	72	88	1477	22	67.14
12	7	702001110	72	50	71	73	69	71	68	78	1516	22	68.91
13	8	702001210	71	25	50	59	56	69	64	57	1228	22	55.82
14	10	702001310	67	54	41	70	52		74	65	1217	20	60.85
15	11	702001510	51	34	46	62	50	74	58		1001	19	52.68
16	12	702001710	51	24		56	59	70	58	63	1014	19	53.37
17	13	702001810	54	53	60	74	65	86	75	82	1496	22	68.00
18	14	702002209	40	31	44	56			54	49	822	18	45.67
19	15	702002309	65	62	61					33	663	12	55.25
20	16	702002410	57	48	67	82			77	68	1197	18	66.50
21	17	702002510	40	25	58	78			54	69	972	18	54.00
22	18	702002610	45	51	55	80			55	67	1059	18	58.83
23	19	702002710	68	73	65	76			72	63	1251	18	69.50
24	20	702002810	58	40	52	69			66	42	981	18	54.50
25	21	702003010	48	72	44	68			76	52	1080	18	60.00
26	22	702003110	44	40	62	73			72	61	1056	18	58.67
27	23	702003310	49	24	51	57			49	31	783	18	43.50
28	24	702003410	58	76	75	86			77	75	1341	18	74.50
29	25	702003510	42	66	61	60			62	57	1044	18	58.00
30	26	702003610	62	31	62					41	588	12	49.00

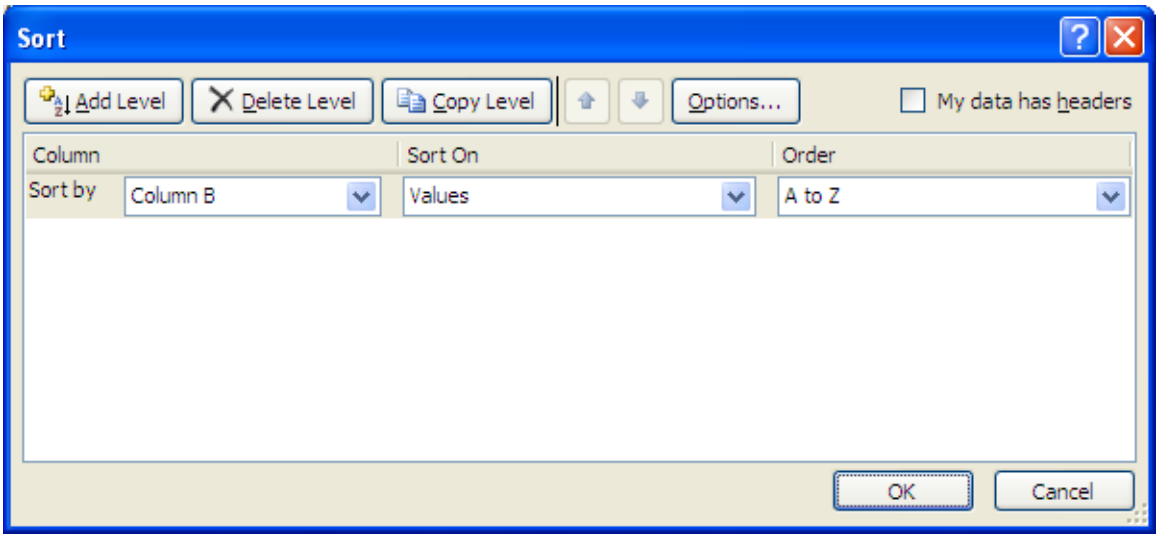
Let us assume we now want the results to be displayed in order of merit, that is into descending order of SWA. The needed steps are as follows:

1. Select cells B6 to M30

2. From the **Home** menu, select **Sort & Filter** from the **Editing** group. You will obtain the following figure



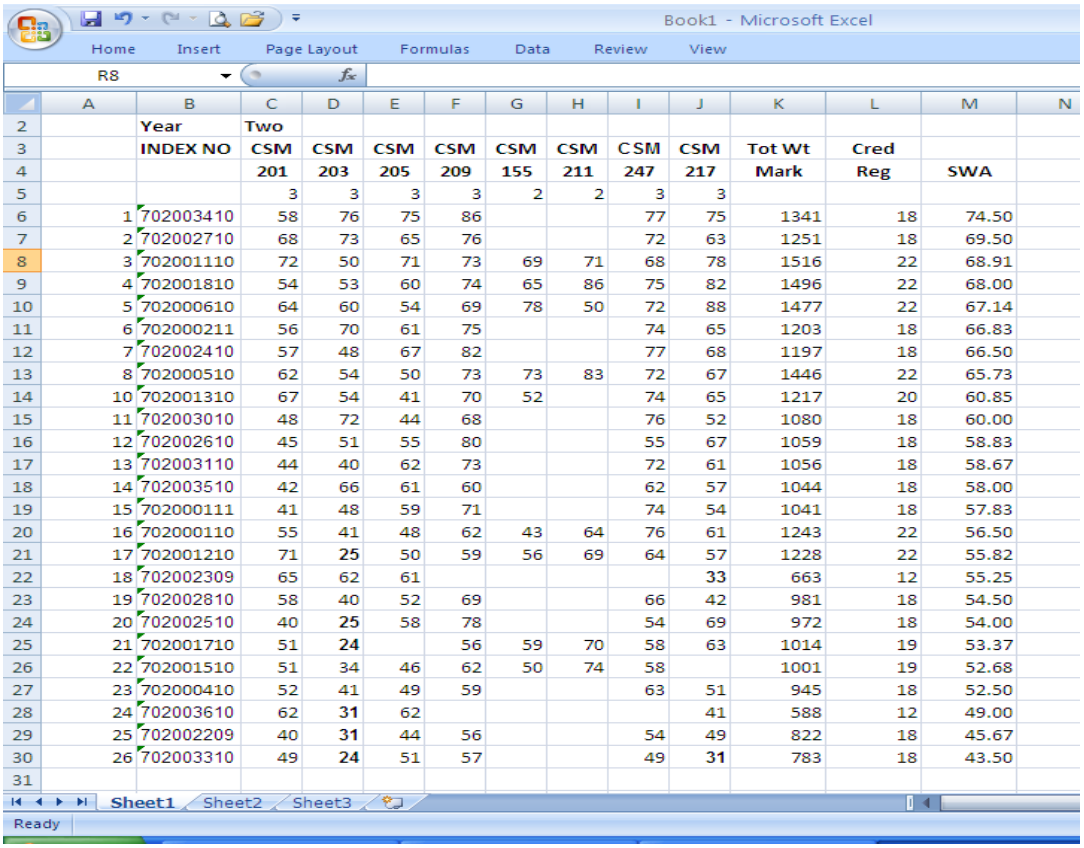
3. Since the column the sorting is based on is not the first column in the range of cells selected, you can neither use **Sort A to Z** nor **Sort Z to A** but rather **Custom Sort**. You will then obtain the sort dialog box as follows:



4. Pull down the **Sort by** and select Column M (the SWA column).

5. Pull down the Order and select **Z to A** (or **Largest to Smallest**. This depends on how Excel treats some of your numeric data) since we want the records to be sorted into descending order of the SWA.

6. Click at the OK button and your worksheet will appear as follows:



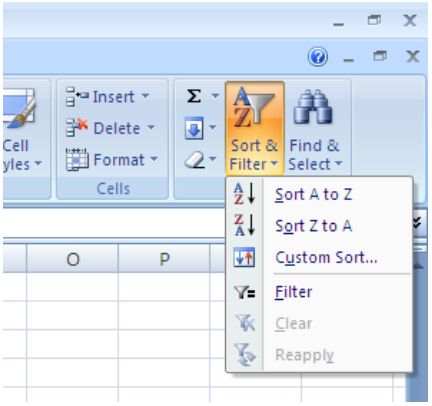
	A	B	C	D	E	F	G	H	I	J	K	L	M
2		Year	Two										
3		INDEX NO	CSM	CSM	CSM	CSM	CSM	CSM	CSM	CSM	Tot Wt	Cred	
4			201	203	205	209	155	211	247	217	Mark	Reg	SWA
5			3	3	3	3	2	2	3	3			
6	1	702003410	58	76	75	86			77	75	1341	18	74.50
7	2	702002710	68	73	65	76			72	63	1251	18	69.50
8	3	702001110	72	50	71	73	69	71	68	78	1516	22	68.91
9	4	702001810	54	53	60	74	65	86	75	82	1496	22	68.00
10	5	702000610	64	60	54	69	78	50	72	88	1477	22	67.14
11	6	702000211	56	70	61	75			74	65	1203	18	66.83
12	7	702002410	57	48	67	82			77	68	1197	18	66.50
13	8	702000510	62	54	50	73	73	83	72	67	1446	22	65.73
14	10	702001310	67	54	41	70	52		74	65	1217	20	60.85
15	11	702003010	48	72	44	68			76	52	1080	18	60.00
16	12	702002610	45	51	55	80			55	67	1059	18	58.83
17	13	702003110	44	40	62	73			72	61	1056	18	58.67
18	14	702003510	42	66	61	60			62	57	1044	18	58.00
19	15	702000111	41	48	59	71			74	54	1041	18	57.83
20	16	702000110	55	41	48	62	43	64	76	61	1243	22	56.50
21	17	702001210	71	25	50	59	56	69	64	57	1228	22	55.82
22	18	702002309	65	62	61					33	663	12	55.25
23	19	702002810	58	40	52	69			66	42	981	18	54.50
24	20	702002510	40	25	58	78			54	69	972	18	54.00
25	21	702001710	51	24		56	59	70	58	63	1014	19	53.37
26	22	702001510	51	34	46	62	50	74	58		1001	19	52.68
27	23	702000410	52	41	49	59			63	51	945	18	52.50
28	24	702003610	62	31	62					41	588	12	49.00
29	25	702002209	40	31	44	56			54	49	822	18	45.67
30	26	702003310	49	24	51	57			49	31	783	18	43.50

Sorting Data based on more than one Column

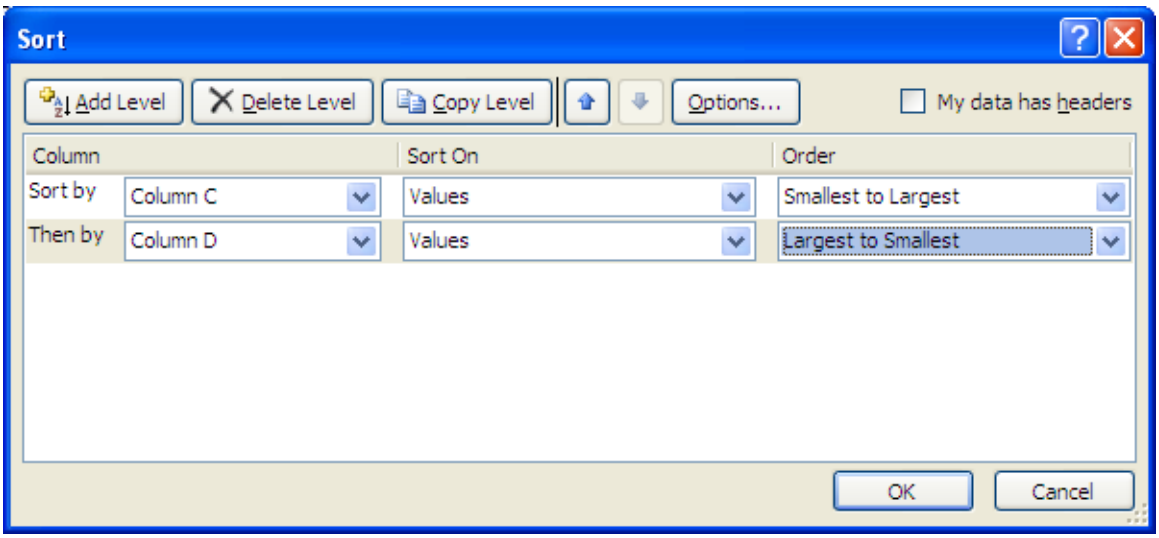
It is possible to sort data based on two or more columns. The steps involved are not much different from sorting based on a single column. Let us assume that we want to sort the above worksheet on descending order of CSM 203 within ascending order of CSM 201. This means we want to first sort the data into ascending order of CSM 201 and when two or more of the CSM 201 marks are the same, those that are the same should be sorted into descending order of CSM 203. In this case the steps needed are as follows:

1. Select cells B6 to M30

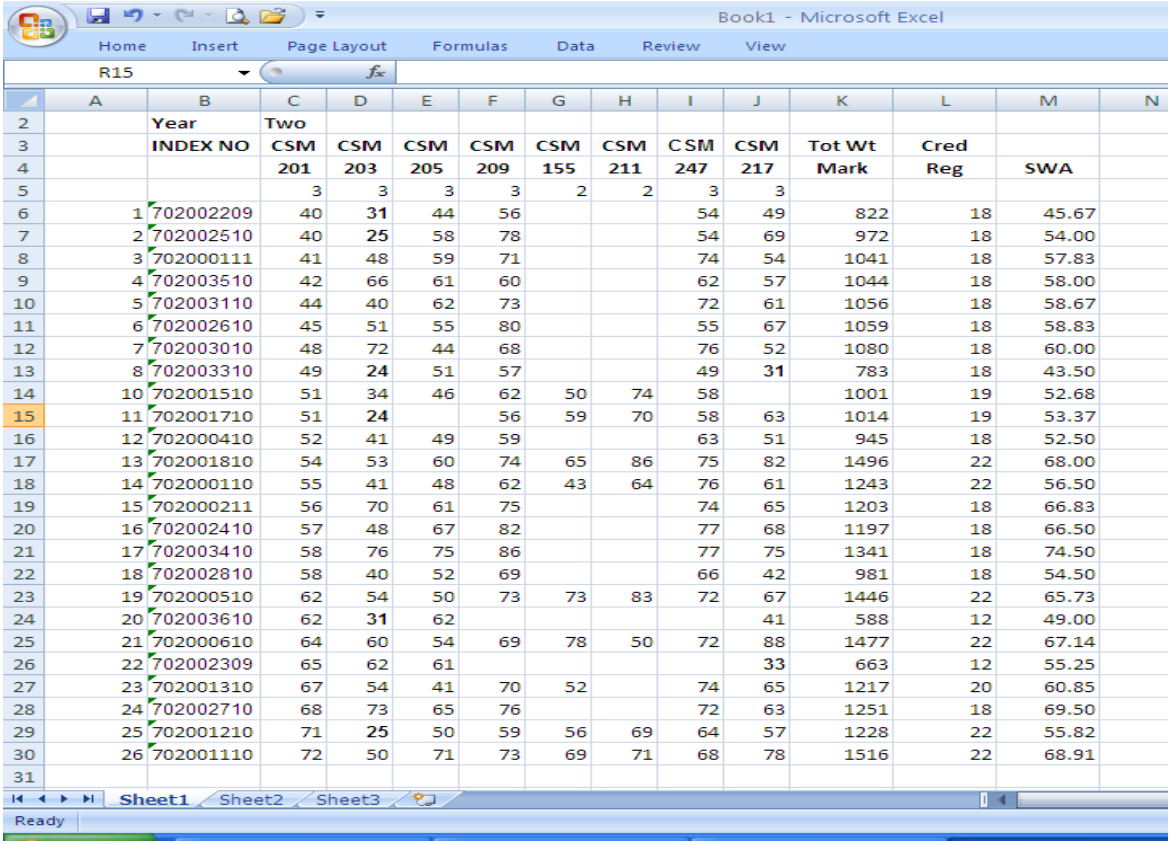
2. From the **Home** menu, select **Sort & Filter** from the **Editing** group. You will obtain the following figure



3. Since the column the sorting is based on is not the first column in the range of cells selected, you can neither use **Sort A to Z** nor **Sort Z to A** but rather **Custom Sort**. Complete the Sort dialog box you will obtain as follows:



Note that the **Then By** line will only show when you click at the **Add Level** button. Your worksheet will now appear as follows:



Book1 - Microsoft Excel

Home Insert Page Layout Formulas Data Review View

R15

	A	B	C	D	E	F	G	H	I	J	K	L	M
2		Year	Two										
3		INDEX NO	CSM	CSM	CSM	CSM	CSM	CSM	CSM	CSM	Tot Wt	Cred	
4			201	203	205	209	155	211	247	217	Mark	Reg	SWA
5			3	3	3	3	2	2	3	3			
6	1	702002209	40	31	44	56			54	49	822	18	45.67
7	2	702002510	40	25	58	78			54	69	972	18	54.00
8	3	702000111	41	48	59	71			74	54	1041	18	57.83
9	4	702003510	42	66	61	60			62	57	1044	18	58.00
10	5	702003110	44	40	62	73			72	61	1056	18	58.67
11	6	702002610	45	51	55	80			55	67	1059	18	58.83
12	7	702003010	48	72	44	68			76	52	1080	18	60.00
13	8	702003310	49	24	51	57			49	31	783	18	43.50
14	10	702001510	51	34	46	62	50	74	58		1001	19	52.68
15	11	702001710	51	24		56	59	70	58	63	1014	19	53.37
16	12	702000410	52	41	49	59			63	51	945	18	52.50
17	13	702001810	54	53	60	74	65	86	75	82	1496	22	68.00
18	14	702000110	55	41	48	62	43	64	76	61	1243	22	56.50
19	15	702000211	56	70	61	75			74	65	1203	18	66.83
20	16	702002410	57	48	67	82			77	68	1197	18	66.50
21	17	702003410	58	76	75	86			77	75	1341	18	74.50
22	18	702002810	58	40	52	69			66	42	981	18	54.50
23	19	702000510	62	54	50	73	73	83	72	67	1446	22	65.73
24	20	702003610	62	31	62					41	588	12	49.00
25	21	702000610	64	60	54	69	78	50	72	88	1477	22	67.14
26	22	702002309	65	62	61					33	663	12	55.25
27	23	702001310	67	54	41	70	52		74	65	1217	20	60.85
28	24	702002710	68	73	65	76			72	63	1251	18	69.50
29	25	702001210	71	25	50	59	56	69	64	57	1228	22	55.82
30	26	702001110	72	50	71	73	69	71	68	78	1516	22	68.91
31													

Sheet1 Sheet2 Sheet3

Ready

As can be seen from the above worksheet the sorting was based on the CSM 201 marks. Looking at where two candidates had the same mark in CSM 201, their records are sorted based on their marks in CSM 203. Those with serial numbers 17 and 18 marks this quite clear as the others appear to have been based on the index numbers and not their marks in CSM 203.

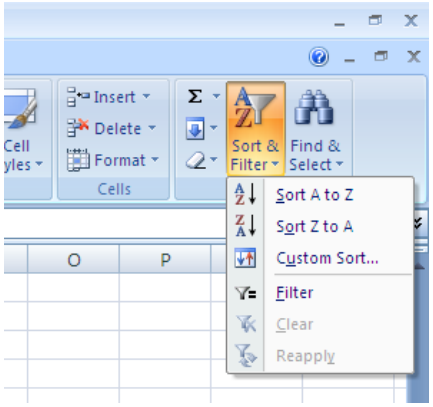
FILTERING

Filtering is a process of displaying only the rows of data that meet a specified criteria or conditions you specify to limit which records are included in the result set of a query or filter that you specify and will hide rows that do not meet the criteria. After you have filtered data, you can copy, find, edit, format, chart, and print only the filtered data without rearranging or moving it. You can also filter by more than one column. **Using the AutoFilter, you can create three types of filters: by a list values, by a format, or by criteria**. For example, it is possible to filter by cell color or by a list of numbers, but not by both; you can filter by icon or by a custom filter, but not by both. Let us consider the worksheet above and do some filtering.

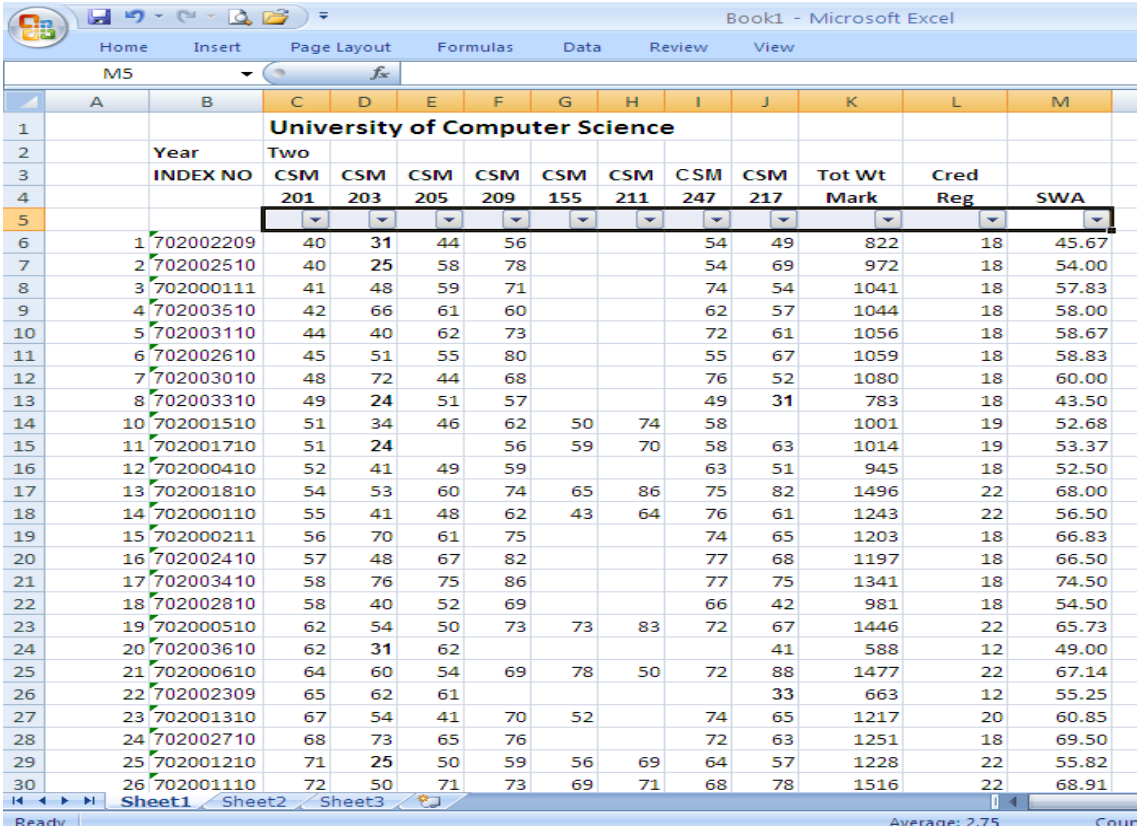
Example 1: Let us assume that we want the records of only students who failed CSM 203 so that they can be advised to work hard by the Examiner. To filter only this group of students the steps needed are as follows:

1. Preferably, select the cells that are just above the first record of the students. If this is not done in our example, you will not be able to filter and hence why it is suggested here to select the cells just above the first record.

2. From the **Home** menu, select **Sort & Filter** from the **Editing** group. You will obtain the following figure



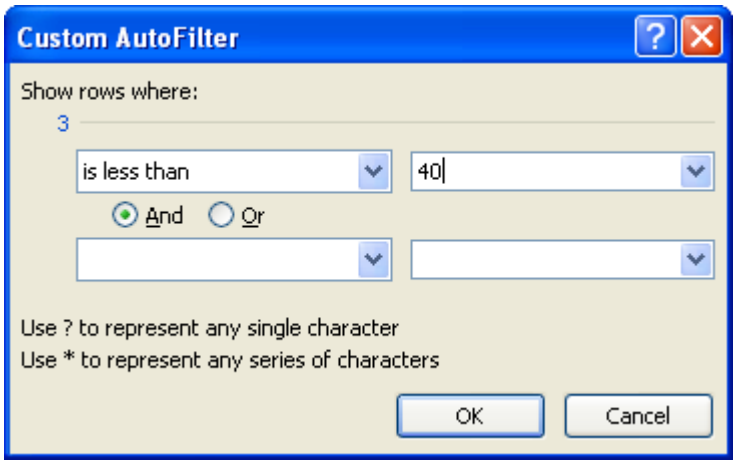
3. Select **filter** to obtain the following screen:



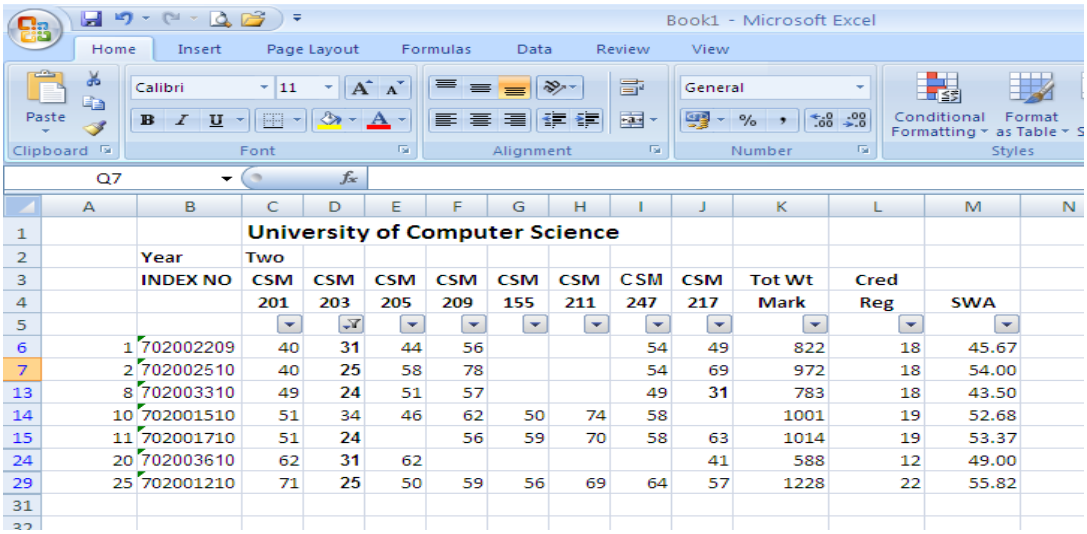
1			University of Computer Science										
2		Year	Two										
3		INDEX NO	CSM	CSM	CSM	CSM	CSM	CSM	CSM	CSM	Tot Wt	Cred	
4			201	203	205	209	155	211	247	217	Mark	Reg	SWA
5													
6	1	702002209	40	31	44	56			54	49	822	18	45.67
7	2	702002510	40	25	58	78			54	69	972	18	54.00
8	3	702000111	41	48	59	71			74	54	1041	18	57.83
9	4	702003510	42	66	61	60			62	57	1044	18	58.00
10	5	702003110	44	40	62	73			72	61	1056	18	58.67
11	6	702002610	45	51	55	80			55	67	1059	18	58.83
12	7	702003010	48	72	44	68			76	52	1080	18	60.00
13	8	702003310	49	24	51	57			49	31	783	18	43.50
14	10	702001510	51	34	46	62	50	74	58		1001	19	52.68
15	11	702001710	51	24		56	59	70	58	63	1014	19	53.37
16	12	702000410	52	41	49	59			63	51	945	18	52.50
17	13	702001810	54	53	60	74	65	86	75	82	1496	22	68.00
18	14	702000110	55	41	48	62	43	64	76	61	1243	22	56.50
19	15	702000211	56	70	61	75			74	65	1203	18	66.83
20	16	702002410	57	48	67	82			77	68	1197	18	66.50
21	17	702003410	58	76	75	86			77	75	1341	18	74.50
22	18	702002810	58	40	52	69			66	42	981	18	54.50
23	19	702000510	62	54	50	73	73	83	72	67	1446	22	65.73
24	20	702003610	62	31	62					41	588	12	49.00
25	21	702000610	64	60	54	69	78	50	72	88	1477	22	67.14
26	22	702002309	65	62	61					33	663	12	55.25
27	23	702001310	67	54	41	70	52		74	65	1217	20	60.85
28	24	702002710	68	73	65	76			72	63	1251	18	69.50
29	25	702001210	71	25	50	59	56	69	64	57	1228	22	55.82
30	26	702001110	72	50	71	73	69	71	68	78	1516	22	68.91

4. Since we want to filter those who failed at least a course, pull down the down arrow key in cell D6 and move the mouse pointer over **Number filter**.

5. Select **Less Than** and you will obtain the following screen:



6. Since a mark of 40 is failed, enter 40 as shown in the above figure and click ok. By that we are asking to show only rows where the mark is less than 40. The screen obtained will be as follows:



	A	B	C	D	E	F	G	H	I	J	K	L	M
1			University of Computer Science										
2		Year	Two										
3		INDEX NO	CSM	CSM	CSM	CSM	CSM	CSM	CSM	CSM	Tot Wt	Cred	
4			201	203	205	209	155	211	247	217	Mark	Reg	SWA
6	1	702002209	40	31	44	56			54	49	822	18	45.67
7	2	702002510	40	25	58	78			54	69	972	18	54.00
13	8	702003310	49	24	51	57			49	31	783	18	43.50
14	10	702001510	51	34	46	62	50	74	58		1001	19	52.68
15	11	702001710	51	24		56	59	70	58	63	1014	19	53.37
24	20	702003610	62	31	62					41	588	12	49.00
29	25	702001210	71	25	50	59	56	69	64	57	1228	22	55.82

Note that we have shown those who failed in CSM 203.

CHAPTER EIGHT

MICROSOFT POWERPOINT

Introduction

PowerPoint is presentation graphics program - software that helps you create a slide show presentation. PowerPoint includes all the features you need to produce professional-looking presentations. When you create a PowerPoint presentation, it is made up of a series of slides. The slides contain the information you want to communicate with your audience. This information can include text, bulleted list, pictures, charts, multimedia video and sound clips, and more.

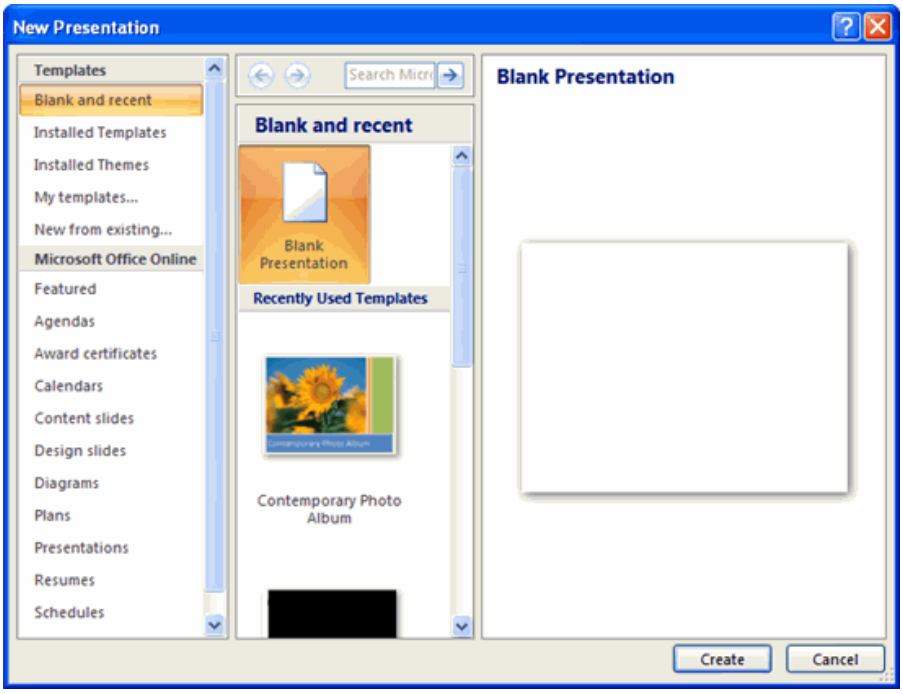
CREATING NEW PRESENTATIONS

When you open PowerPoint from the **Start** menu or from an icon on your desktop, a new presentation with **one slide** appears by default.

You can also create a new presentation while PowerPoint is **already open**.

- Click the **Microsoft Office Button** and choose **New** from the menu.

The **New Presentation** dialog box will appear. **Blank** presentation is selected by default.



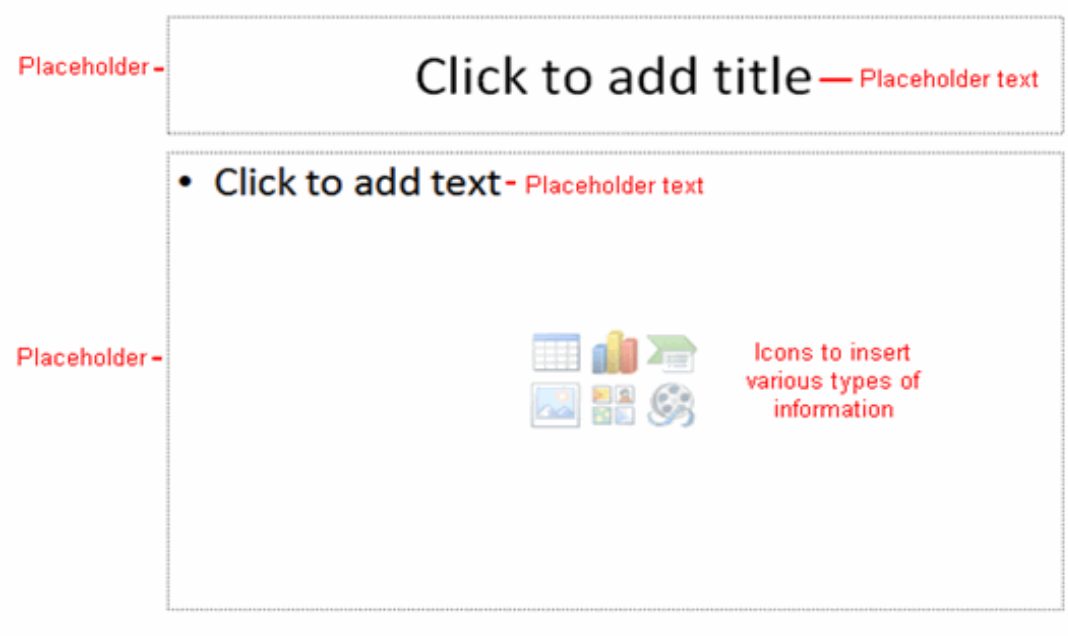
- Click **Create**, and a new presentation will open in the PowerPoint window.

The default slide that appears when you create a new presentation is a **Title Slide** layout.

Slide Basics

Slides contain **placeholders**, or areas on a slide that are enclosed by dotted borders. Placeholders can contain many different items including text, pictures, and charts. Some placeholders have **placeholder text**, or text that you can replace, and **thumbnail-sized icons** that represent specific commands such as Insert Picture, Insert Chart, and Insert

Clip Art.



About Slide Layouts

The placeholders are arranged in different **layouts** that you can select when you **insert a new slide** or that can be **applied to existing slides**. In the example above, the layout is called **Title and Content** and includes title and content placeholders.

A slide layout **arranges** your slide content. Layouts contain different types of placeholders that you can use depending on what information you want to include in your presentation. Each layout has a descriptive name, but the image of the layout shows you how the placeholders are arranged on the slide.

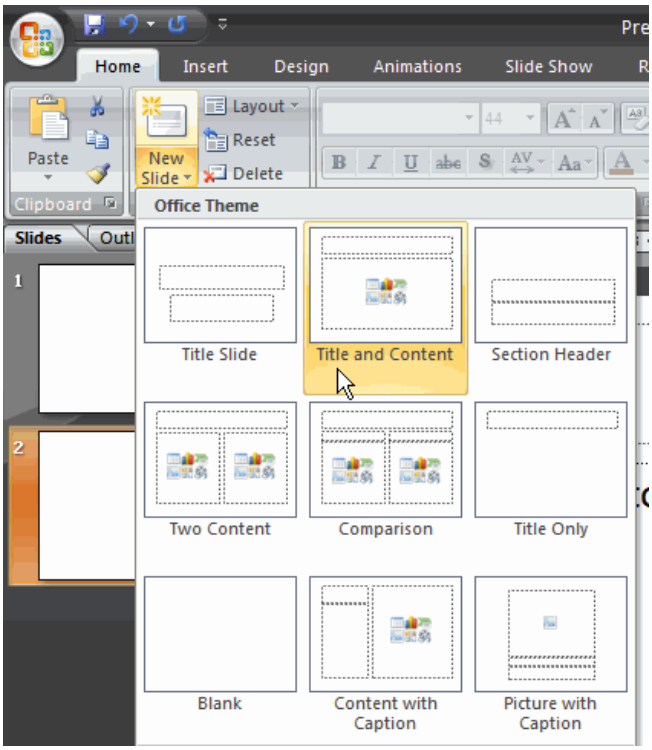
To Insert Text into a Placeholder:

- Click inside the **placeholder**. The placeholder text will disappear and the **insertion point** will appear.
- Type your text once the insertion point is visible.
- Click **outside the placeholder** when you have entered all your text into the placeholder.

When you enter text or use the icons to insert items, the placeholder text and/or icons disappear as soon as you start typing.

To Insert a New Slide:

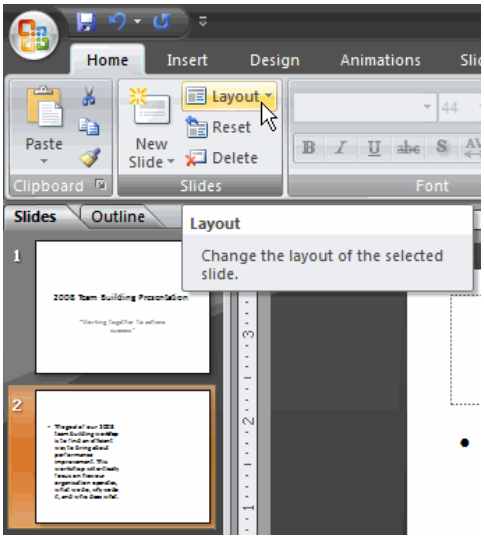
- Click the **New Slide** command in the **Slides** group on the Home tab. A menu will appear with your slide layout options.



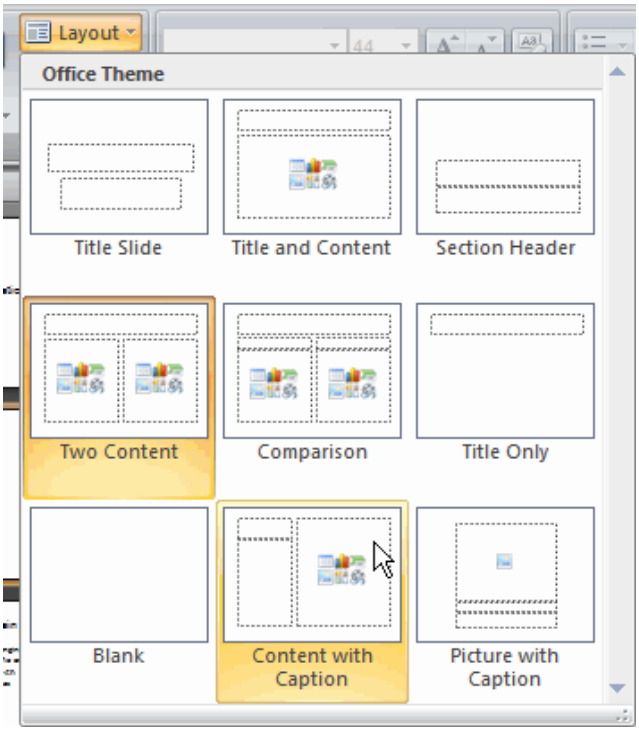
- Click the slide you want to insert. A new slide with the chosen layout will appear in the center of the PowerPoint window and in the pane on the left.

To Change the Layout of an Existing Slide:

- Select the slide you wish to change.
- Click the **Layout** command in the **Slides** group on the Home tab. A menu appears with your options.



- Click an option to select it. The slide will change in the presentation.



Working with Slides

To Copy and Paste a Slide:

- Select the slide you wish to copy.
- Click the **Copy** command on the Home tab.

- Click inside the slides tab on the left task pane. A **horizontal insertion point** will appear.
- Move the insertion point to the location you want the copy of the slide to appear.
- Click the **Paste** command on the Home tab. The copied slide will appear.

You can use the keyboard shortcut **Ctrl** and **C** to copy the slide and **Ctrl** and **V** to paste it.

To Delete a Slide:

- Select the slide you wish to **delete**.
- Click the **Delete** command in the Slides group on the Home tab.

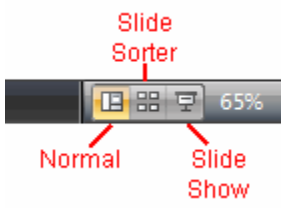
You can also delete a slide by pressing the Delete key on your keyboard.

To Move a Slide:

- Select the slide you wish to **move** on the slides tab in the left task pane.
- Click and drag the slide to a new location. The insertion point will appear.
- Release the mouse button. The slide will appear in the new location.

Using Different Views from the PowerPoint Window

In the bottom, right corner of the PowerPoint window are three **view** commands. From here, you can change the view to Normal, Slide Sorter, or Slide Show view by just clicking a command.



Normal is the **default view** and where you will create and edit your slides in the center slide pane and all the slides will appear on the slides tab in the left task pane.

Slide Sorter is a view of your slides in thumbnail form. The slides are presented horizontally, which allows you to see more slides at a time.

Slide Show view fills the computer screen with your presentation so you can see how the presentation will appear to the audience.

Saving Your Presentation

If you are saving a document for the first time, you will need to use the **Save As** command; however, if you have already saved a presentation, you can use the **Save** command.

To Use the Save As Command:

- Click the **Microsoft Office Button**.
- Select **Save As**. A menu will appear.
- Select the type of file you would like to save the presentation as. The two most commonly used file types are:
    - **PowerPoint Presentation** -- This saves the presentation as a 2007 PowerPoint file. Only users with PowerPoint 2007, or the compatibility pack, can view the file without possibly losing some of the formatting.
    - **PowerPoint 97-2003 Presentation** -- This saves the presentation so that it is compatible with some previous versions of Excel. If you will be sending the presentation to someone that does not have Office 2007, you should use this file type.
- The Save As dialog box will appear. Select the **location** you wish to save the document using the drop-down menu.
- Enter a **name** for the document.
- Click the **Save** button.

To Use the Save Command:

- Click the **Microsoft Office Button**.
- Select **Save** from the menu.

Using the Save command saves the document in its current location using the same file name.

Text Basics

In PowerPoint, you can insert text into placeholders or text boxes. Text in both can be formatted using the same commands.

To Insert Text:

- Click the **placeholder** or **text box** where you wish to insert text. The **insertion point** will appear. If you are working with a placeholder, placeholder text will disappear.
- Type the text you wish to appear.

To Delete Text:

- Place your cursor next to the text you wish to delete.
- Press the **Backspace** key on your keyboard to delete text to the left of the cursor.
- Press the **Delete** key on your keyboard to delete text to the right of the cursor.

To Select Text:

- Place the **insertion point** next to the text you wish to select.
- Click and drag your mouse over the text to select it.
- Release the mouse button. You have selected the text. A **highlighted box** will appear over the selected text.

When you select text or images in PowerPoint, a **hover toolbar** with formatting options appears. This makes formatting commands easily accessible, which may save you time.

To Format Font Size:

- Select the text you wish to modify.
- Click the **drop-down arrow** next to the **font size box** on the Home tab. The font size drop-down menu appears.
- Move your cursor over the various font sizes. A **live preview** of the font size will appear in the document.
- Click the font size you wish to use. The font size will change in the document.

To Format Font Style:

- Select the text you wish to modify.

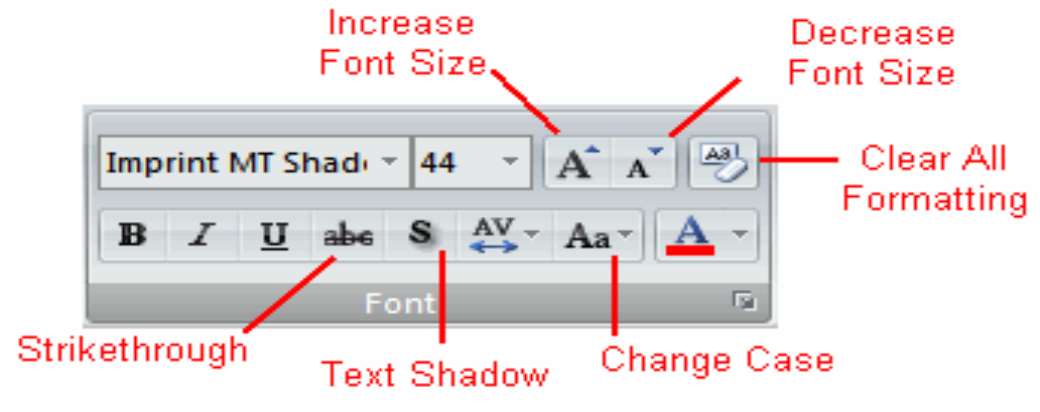
- Click the **drop-down arrow** next to the **font style box** on the Home tab. The font style drop-down menu appears.
- Move your cursor over the various font styles. A **live preview** of the font will appear in the document.
- Click the font style you wish to use. The font style will change in the document.

To Format Font Color:

- Select the text you wish to modify.
- Click the drop-down arrow next to the **font color box** on the Home tab. The font color menu appears.
- Move your cursor over the various font colors. A live preview of the color will appear in the document.
- Click the font color you wish to use. The font color will change in the slide.
- Select **More Colors** at the bottom of the list to access more color choices.

To Use the Bold, Italic, and Underline Commands:

- Select the text you wish to modify.
- Click the Bold, Italic, or Underline command in the **Font group** on the Home tab.



Increase Font Size command increases the font size of the selected text to the next standard font size.

Decrease Font Size command decreases the font size of the selected text to the next standard font size.

Clear All Formatting command removes your recent formatting changes.

Strikethrough command makes a line through the text.

Text Shadow command adds a drop shadow to text.

Change Case commands lets you try different capitalization options without having to delete and retype letters or words.

To Change Text Alignment:

- Select the text you wish to modify.
- Select one of the four **alignment options** from the Paragraph group on the Home tab.
    - **Align Text Left:** Aligns all the selected text to the left margin.
    - **Center:** Aligns text an equal distance from the left and right margins.
    - **Align Text Right:** Aligns all the selected text to the right margin.
    - **Justify:** Justified text is equal on both sides and lines up equally to the right and left margins.

The alignment commands align the text within the placeholder or text box it is in, not across the slide.

Themes and Background Styles

A **theme** is a **predefined combination** of colors, fonts, and effects that can be applied to your presentation. PowerPoint includes built-in themes that allow you to easily create professional-looking presentations without spending a lot of time formatting. Each theme has additional background styles associated with it that can be applied to the slides to modify the theme.

When you create a **new presentation** in PowerPoint there is a theme applied even though the slide background is white. This default theme is called the **Office Theme**. The Office Theme consists of a white background, and Calibri font of various sizes for titles and body text.

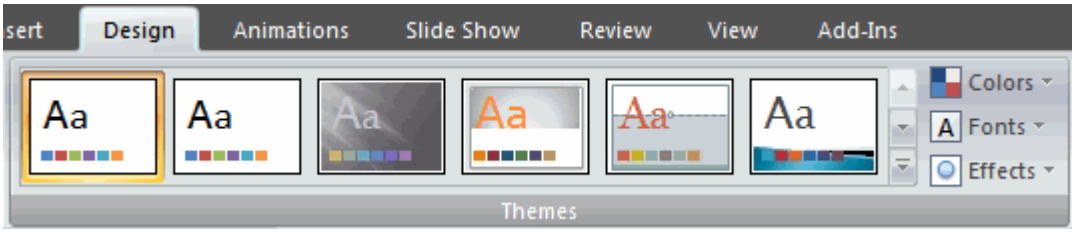
You can apply a **different theme** to your slides **before** you add text or make changes to the default slide. An advantage of doing this is that the location of the text will not move. If you apply the theme after you enter text on the slides, the text boxes and placeholders may move depending on the theme you choose.

An advantage of entering some of your text before applying a new theme is that the **live preview** feature allows you to see how the themes will affect your specific text. The example below is the Aspect theme.

All of the themes that come included in PowerPoint are located in the Themes group on the Design tab.

To Apply a Theme:

- Select the **Design** tab.
- Locate the **Themes** group. Each image represents a theme.



- Click the drop-down arrow to access more themes.
- Hover over a theme to see a **live preview** of it in the presentation. The name of the theme will appear as you hover over it.
- Click a theme to apply it to the slides.

Fonts that are changed with the font size and style menus **will not** change when you apply a new theme.

Modify Themes

You can also **modify** the current theme **colors**, **fonts**, and **effects**. For example, if you like the **Urban** theme, but would prefer to use more of the color red in the presentation, you can change the colors of the theme and create a new, **custom theme**. If you would prefer to use the font style Verdana so that your presentation font will match your company logo and materials, you can modify the font combination and save it.

The PowerPoint themes are powerful because they allow you to create professional-looking slides easily. The option to modify these themes makes it an even more robust and powerful tool because you can customize the themes based on your needs and preferences.

Background Styles

Background styles can be added to your slides after a theme is applied. The styles are fill variations based on theme colors. When you **switch to a different theme**, the background styles are updated based on the new theme colors. The background style options for the Urban theme are different than the background style options for the Apex theme. The colors are different based on the theme colors.

To Apply a Background Style:

- Click the **Background Styles** command in the **Background** group on the Design tab
- Click a style to select it. The new background will appear in the slides.

You can select Format Background from the menu to open a dialog box and make changes to the background color.

Text boxes

In addition to inserting text in placeholders, you can also insert text into text boxes. Text boxes allow you to add to the predefined layouts so that you can place text wherever you want on a slide.

To Insert a Text box:

- Select the **Insert** tab on the Ribbon.
- Click the **Text Box** command in the **Text** group.
- Click and drag the cursor until the text box is the desired width.
- Release the mouse button.

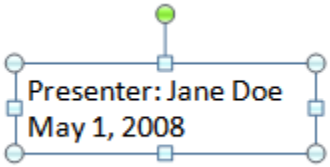
To Move a Text Box:

- Click the text box. Your cursor becomes a **cross with arrows** on each end.
- While holding the mouse button, **drag** the text box to the desired location on the page.
- Release the mouse button.

To Resize a Text Box:

- Select the text box.

- Click one of the **square sizing handles** on the left or right sides, or a circular handle on one of the four corners.
- While holding down the mouse button, **drag the sizing handle** until the text box is the desired width.



Click and drag the green circle to rotate the text box.

Moving Text

To Copy and Paste Text:

- Select the text you wish to copy.
- Click the **Copy** command on the Home tab.
- Place your insertion point where you wish the text to appear.
- Click the **Paste** command on the Home tab. The text will appear

To Drag and Drop Text:

- Select the text you wish to copy.
- Click your mouse and **drag the text** to the location you wish it to appear. The cursor will have a text box beneath it to indicate that you are moving text.
- Release the mouse button and the text will appear.

Working with Lists

Bulleted and numbered lists can be used in your presentation to **arrange and format text** on slides to draw emphasis to specific information. Also, lists can often be **easier** for the audience **to read** than paragraphs of text on a slide.

Working with Lists

Some **slide layouts** include a **content placeholder** where you can **add text**, or use graphical commands to insert tables, charts, SmartArt graphics, pictures, clip art, and media clips. On these slides, a bullet appears to the left of the placeholder text. If you choose to add text, rather than using one of the graphical commands to insert an item, the text is formatted into a **list** by default.

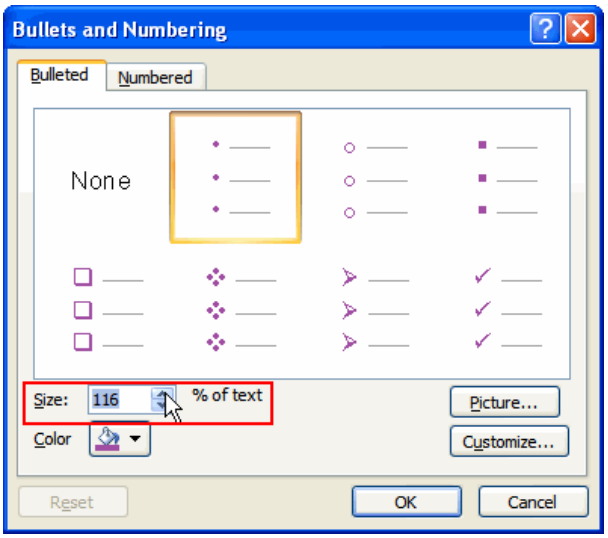
To Insert Text as a List in a Content Placeholder:

- Select the **placeholder**. The placeholder text will disappear and the insertion point will appear to the right of the bullet.
- Enter **text**. If the text requires more than one line, it will automatically wrap to the following line.
- Press the **Enter** key. A new bullet will appear on the following row.
- Repeat the last two steps until all the information is entered in list format on the slide.

Bulleted Lists

To Select an Alternate Bullet Style or Switch to a Bulleted List:

- Select all the text in an existing list (if text has been entered).
- Click the drop-down arrow next to the **Bullets** command in the Paragraph group on the Home tab. A menu of bullet options will appear
- Click a **bullet option** to select it. The bullet will change on the slide.



- Click **OK** to apply the bullet size to the list in the slide.

To Use a Picture as a Bullet:

- Select an existing bulleted list (if text has been entered).

- Click the drop-down arrow next to the **Bullets** command on the Home tab. A menu will appear.
- Select **Bullets and Numbering** from the menu. A dialog box will appear.
- Click **Picture** on the Bulleted tab. The Picture Bullet dialog box will open.
- Click a picture to select it.
- Click **OK** to apply the picture to the list in the slide.

Click Import to import your own picture and use it as a bullet.

To Use a Symbol as a Bullet:

- Select an existing bulleted list (if text has been entered).
- Click the drop-down arrow next to the **Bullets** command on the Home tab. A menu will appear.
- Select **Bullets and Numbering** from the menu. A dialog box will appear.
- Click **Customize** on the Bulleted tab. The Symbol dialog box will appear.
- Click the **Font:** drop-down menu and select a font category
- Click a **symbol** to select it.
- Click OK. The symbol will now appear as the selected bullet option in the Bulleted section of the Bullets and Numbering dialog box.
- Click OK to apply the symbol to the list in the document.

Numbered Lists

To Select an Alternate Numbering Style or Switch to a Numbered List:

- Select all the text in an existing list (if text has been entered).
- Click the drop-down arrow next to the **Numbering** command in the Paragraph group on the Home tab. A menu of numbering options will appear.
- Hover over each **menu option** to display a live preview of the list on the slide.
- Click a numbering option to select it. The list will change on the slide.

To Set the Number to Begin the List:

- Select an existing numbered list (if text has been entered).
- Click the drop-down arrow next to the **Numbering** command on the Home tab. A menu will appear.

- Select **Bullets and Numbering** from the menu. A dialog box will appear.
- Enter the **number** to start the list in the **Start at:** field on the Numbered tab.
- Click OK to apply to the list on the slide.

To Remove Bulleted or Numbered Lists from Text:

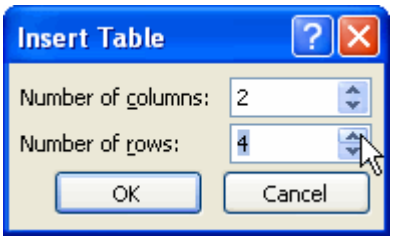
- **Select** an existing bulleted or numbered **list**.
- Click the **Bullets** command or the **Numbering** command, depending on the type of list. Click these commands to **toggle** the feature **on** and **off**.

Working with Tables

The goal of most PowerPoint presentations is to **communicate information** to someone, or to a group of people. The information can be communicated in various ways such as pictures, lists, or paragraphs of text. Another way is to use a **table** to organize the information. A **table** is a grid of cells arranged in **rows** and **columns**.

To Insert a Table Using a Placeholder Command:

- Select the slide where you wish to insert a table.
- Click the **Insert Table** command in the placeholder. The Insert Table dialog box will appear
- Enter the number of table **columns** and **rows** in the dialog box.



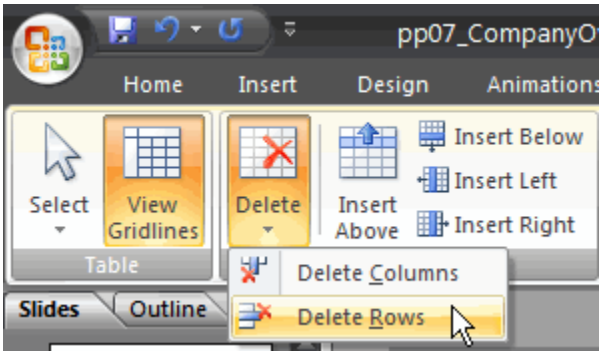
- Click OK. The table will appear on the slide, and the **Design** and **Layout** tabs will appear on the Ribbon.
- Enter text into the table.

You can move your insertion point from cell to cell in the table using the mouse or by pressing the **Tab** key on your keyboard. Additionally, the **arrow keys** can be used to navigate the table.

Working with Rows and Columns

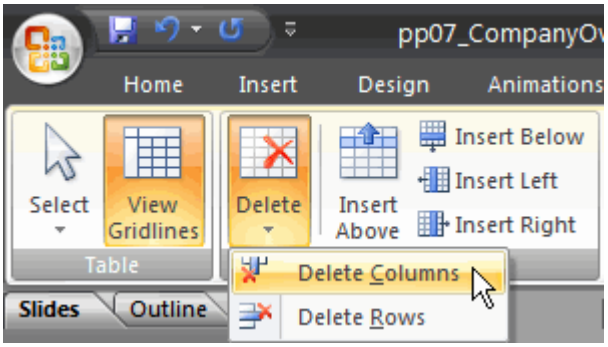
To Insert a Row:

To Delete a Row:



To Insert a Column:

To Delete a Column:



Alternate Method to Insert and Delete Rows and Columns

- Place the insertion point in the row or column you wish to delete.
- **Right-click** the table and a menu appears.
- Select one of the Insert/Delete menu options.

In addition to inserting a table using the **Insert Table** command in some layouts, you can insert a table using Ribbon commands.

To Insert a Table Using Ribbon Commands:

- Select the slide where you want to insert the table.
- Select the **Insert** tab on the Ribbon.
- Click the **Table** command. A menu will appear.
- Drag your mouse over the diagram squares to select the number of columns and rows in the table.
- Click to insert the table on the slide.
- Enter text into the table.

CHAPTER NINE

INSERTING PICTURES, SOUND AND MOVIES

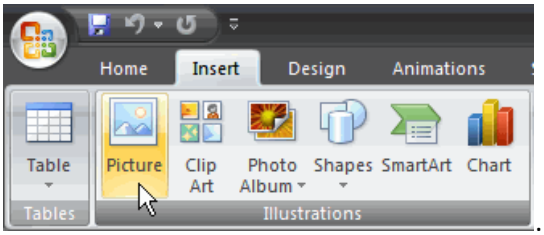
On each slide you create in your presentation, you have information that you want to communicate with the audience. You can do this with text and illustrations, such as pictures and clip art, charts etc.

Inserting Pictures

Pictures and **clip art** can be inserted from the **Ribbon** and by using the commands that appear in certain placeholders. In both methods, the image is centred in the middle of any selected slide placeholders.

To Insert a Picture from the Ribbon:

- Select the **Insert** tab.
- Click the **Insert Picture** command in the **Illustrations** group. The Insert Picture dialog box will appear.
- Locate and select the picture you want to use.
- Click **Insert** and it will appear on the slide



To Insert a Picture from a Placeholder Command:

- Click the **Insert Picture** command in the placeholder. The Insert Picture dialog box will appear.
- Locate and select the picture you want to use.
- Click **Insert** and it will appear on the slide.

Resizing and Moving Pictures

To Resize a Picture:

- Select the picture.
- Click one of the **corner sizing handles**. The cursor will turn into a cross.
- While holding down the mouse button, **drag the sizing handle** until the image is the desired size.
- Release the mouse button.

The side sizing handles change the picture's size, but don't keep the same proportions.

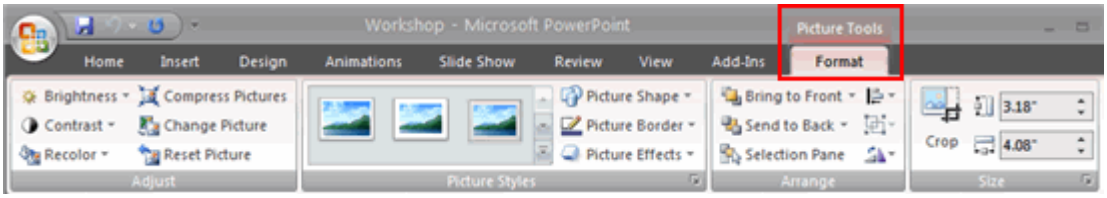
To Move a Picture:

- Click the picture. Your cursor becomes a **cross with arrows** on each end.
- While holding the mouse button, **drag** the image to the desired location on the page.
- Release the mouse button.

The green circle is the Free Rotate feature. Click and hold the mouse button and rotate the picture in various directions.

Modifying Pictures

PowerPoint provides you with several commands that allow you to **modify pictures**. When you select a picture, a **Picture Tools Format** tab appears on the Ribbon. This is an example of PowerPoint 2007 giving you the commands and features you need, when you need them.



To Apply a Picture Style:

- Select the picture.
- Select the **Format** tab.
- Click the **More** drop-down arrow to display all the picture styles.
- Hover over each picture style to see a **live preview** of the style on the slide.
- Click a picture style to apply it to the image.

To Change the Shape of a Picture:

- Select the picture.
- Select the Format tab.
- Click the Picture Shape icon. A menu appears.
- Click a shape to select it. The shape of the picture will change on the slide.

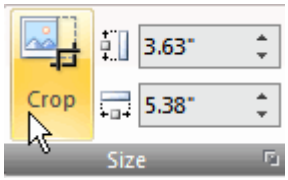
To Add a Border to a Picture:

- Select the picture.
- Select the **Format** tab.
- Click the **Picture Border** command and select a color.

Select **Weight** from the menu and choose a line weight to modify the width of the border line.

To Crop a Picture:

- Select the picture.
- Select the **Format** tab.
- Click the **Crop** command in the Size group. The black cropping handles appear.

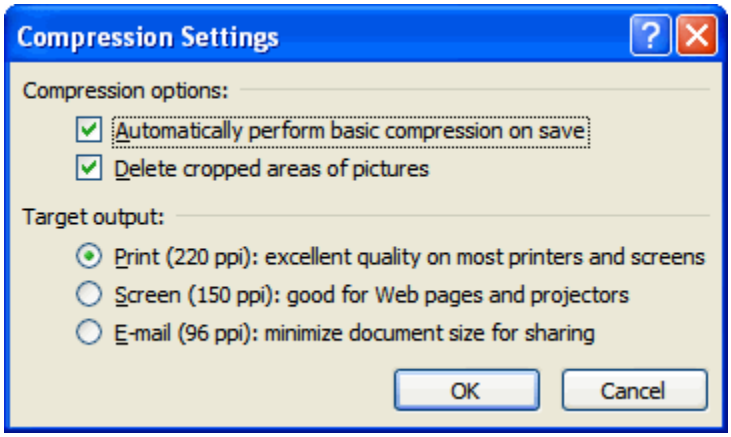


- Click and move a **handle** to crop an image. Corner handles will crop the picture proportionally.
- Click the **Crop** command to deselect the crop tool.

You can crop the picture to a **specific size** using the Shape Height and Shape Width fields to the right of the Crop command in the Size group.

To Compress a Picture:

- Select the picture.
- Select the **Format** tab.
- Click the **Compress Pictures** command in the Adjust group. A dialog box appears.
- Click the **Options** button to access the **Compression Setting** dialog box.
- Choose the target output.
- Change any of the default picture settings you wish.
- Click **OK** in the Compression Settings dialog box.
- Click **OK** in the Compress Pictures dialog box.



Other Picture Tools

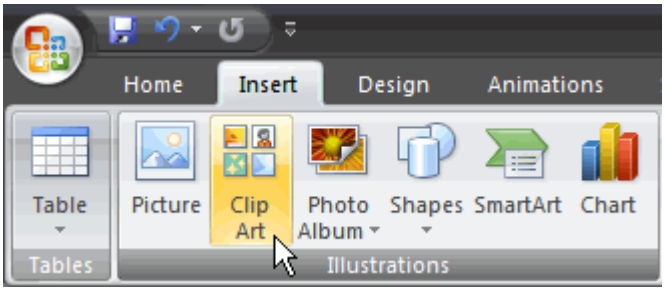
There are many other things you can do to modify a picture. From the Format tab, some of the other useful commands include:

- **Change Picture command**: Select a new picture from your computer.
- **Reset Picture command**: Revert to original picture.
- **Brightness command**: Adjust the brightness of the picture.
- **Contrast command**: Adjust the contrast of the picture from light to dark.
- **Recolor command**: Modify the color in a variety of ways including black and white, sepia, pink, purple, and more.

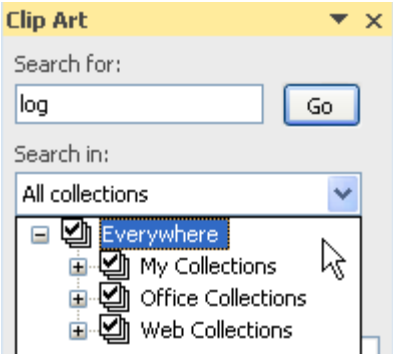
Inserting and Modifying Clip Art

To Insert a Clip Art from the Ribbon:

- Select the **Insert** tab.
- Click the **Clip Art** command in the **Illustrations** group. The Clip Art task pane will appear on the right.



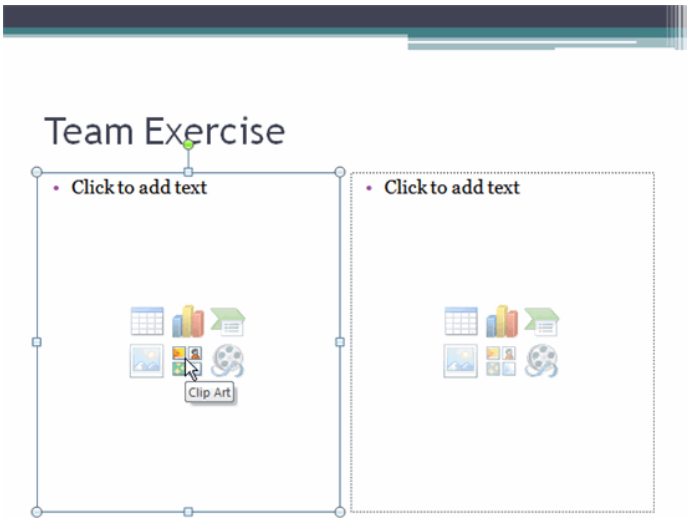
- Enter keywords in the **Search** field that are related to the image you wish to insert.
- Click the drop-down arrow next to the **collections** field.
- Select **Everywhere** to ensure that Word searches your computer and online resources for an image that meets your criteria.



- Click the drop-down arrow in the **media file types** field.
- Deselect any file types you do not wish to see. In this example, we only want photographs, so we deselect the other options.
- Click **Go**. A list of clip art images related to the search terms are displayed.
- Click a clip art image to insert it, or click the drop-down arrow next to the clip art and select Insert from the menu. The clip art will appear in the slide.

To Insert Clip Art from a Placeholder Command:

- Click the **Clip Art** command in the placeholder. The Clip Art task pane will appear on the right.



- Enter keywords in the **Search** field that are related to the image you wish to insert.
- Click the drop-down arrow next to the **collections** field.

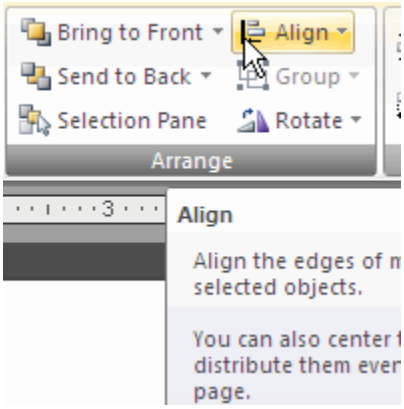
- Select **Everywhere** to ensure that Word searches your computer and online resources for an image that meets your criteria.
- Click the drop-down arrow in the **media file types** field.
- Deselect any file types you do not wish to see. In this example, we only want photographs, so we deselect the other options.
- Click **Go**. A list of clip art images related to the search terms are displayed.
- Click a clip art image to insert it, or click the drop-down arrow next to the clip art and select Insert from the menu. The clip art will appear in the slide.

If the search does not provide the needed results, try different search words, or click the Office Online link to go to the Microsoft website where you can search thousands of clip arts.

Modifying Clip Art

All of the **tools** that can be used to modify pictures can also be used to modify clip art images. Just select the clip art image, and you have all the same editing options that are available for pictures.

Arrange Objects



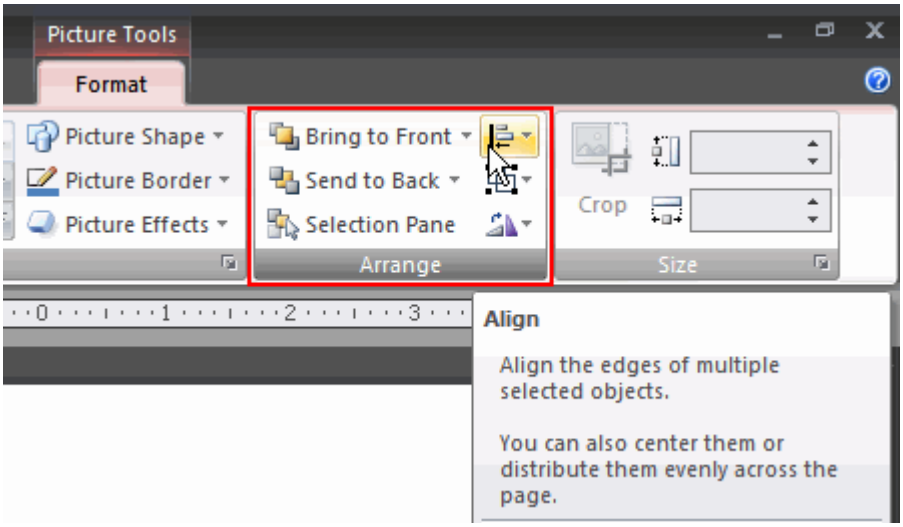
In PowerPoint, you can **align**, **group**, **rotate**, and **order** objects such as pictures, shapes, and text boxes on the slide. Using PowerPoint commands, you can customize the slides and arrange the objects on the slides easily.

Align Objects

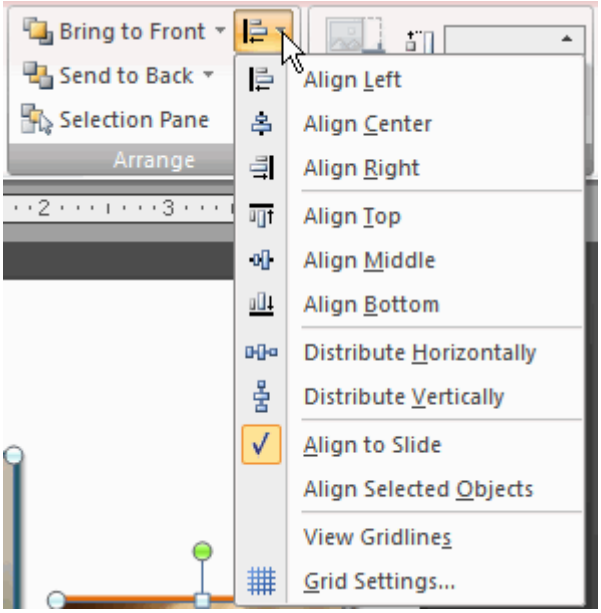
You can **click** and **drag objects** to align them manually, but guesswork will never give you the best result. Additionally, aligning objects in this way can take a great deal of time. Luckily, PowerPoint provides you with several commands that allow you to **easily arrange** and position objects.

To Align Objects:

- Select the **objects** you wish to align.
    - To select multiple objects, click and drag your mouse to form a **selection box** around the objects, and then release the mouse button.
- Sizing handles will appear around each selected object and the Format tab will appear on the Ribbon
- Select the **Format** tab.
- Click the **Align** command in the Arrange group.

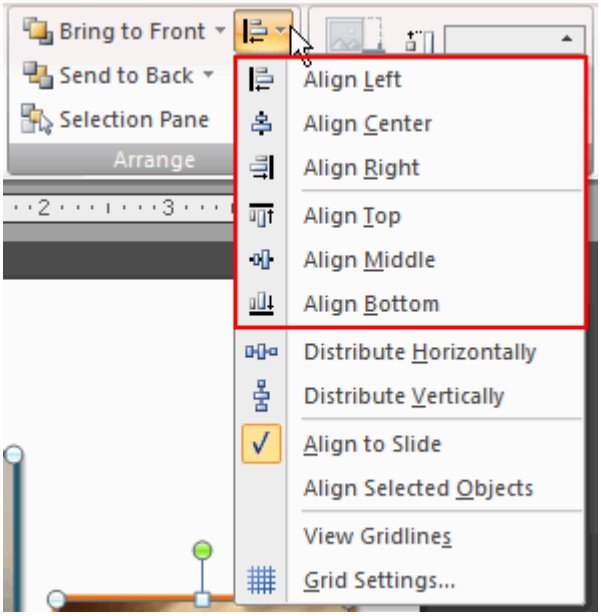


- Select a menu option.



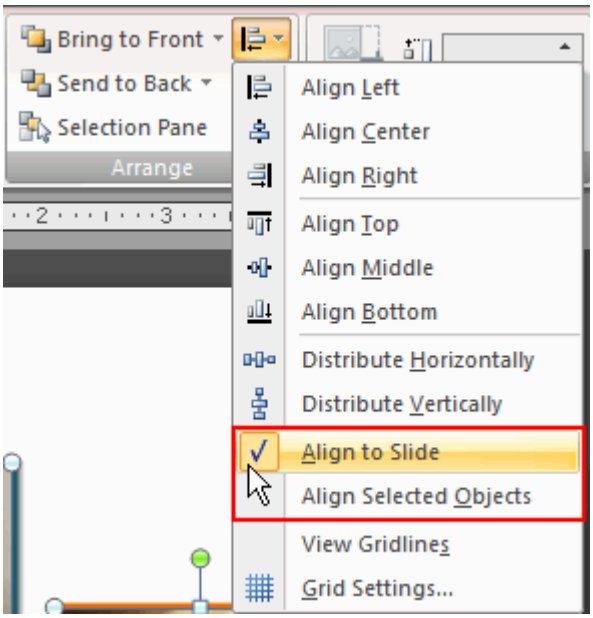
About Alignment

There are six basic **alignment options** on the **Align** menu. The menu options are: Align Left, Align Center, Align Right, Align Top, Align Middle, and Align Bottom.



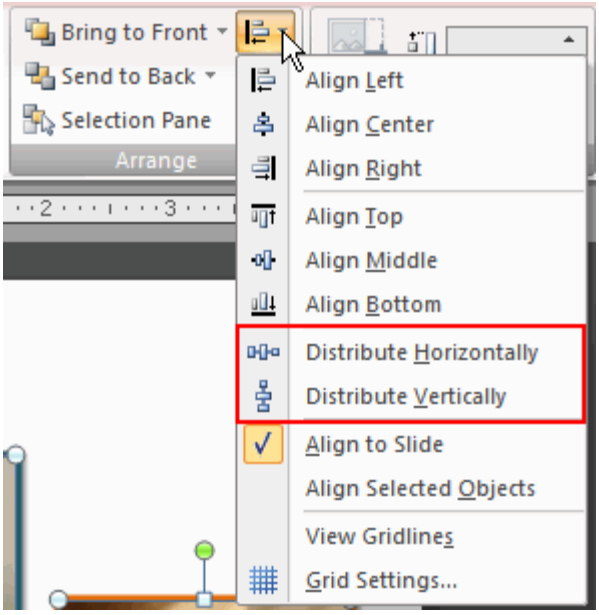
The name of each menu option identifies how the option changes the alignment of the selected objects. (i.e., The Align Left menu option will align the selected objects to the

left). However, each of these alignment options will vary based on whether **Align to Slide** or **Align Selected Objects** is selected from the menu.



For example, if **Align Selected Objects** is active, and then you choose **Align Top** from the menu, the top of the selected objects will align. If **Align to Slide** is selected, and then you choose **Align Top** from the menu, all the selected objects will align **to the top of the slide**. The examples below indicate how the menu choice of Align Selected Objects or Align to Slide affect the six basic alignment options.

There are two menu options that affect whether the objects are **distributed horizontally** or **vertically** across the slide. These options are also affected by whether **Align Selected Objects** or **Align to Slide** is selected on the menu.



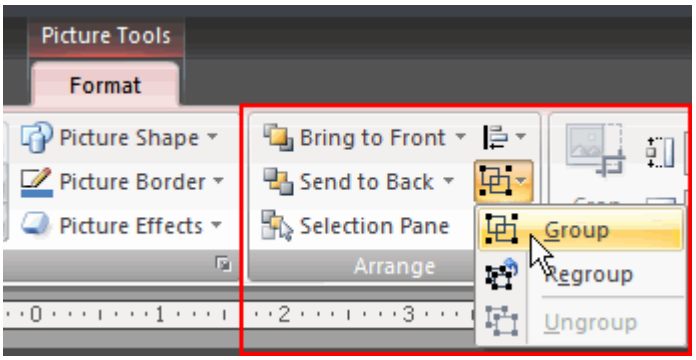
Not every alignment option will work in all situations. The best way to learn how each alignment option arranges objects is to practice using the Align menu options.

Group and Rotate Objects

Another command you can use to arrange objects is the **Group** command. At times you may want to **group objects** to make them easier to position on the slide. Instead of moving each object individually or using the align menu options to arrange the objects on the slide, you can **group** multiple objects into **one object**. Moving one object is often easier and faster than moving multiple objects on the slide.

To Group Objects:

- Select the **objects** you wish to **group**.
    - To select multiple objects, click and drag your mouse to form a **selection box** around the objects, and then release the mouse button.
- Sizing handles will appear around each selected object and the Format tab will appear on the Ribbon.
- Select the **Format** tab.
- Click the **Group** command in the Arrange group.
- Select **Group** from the menu.



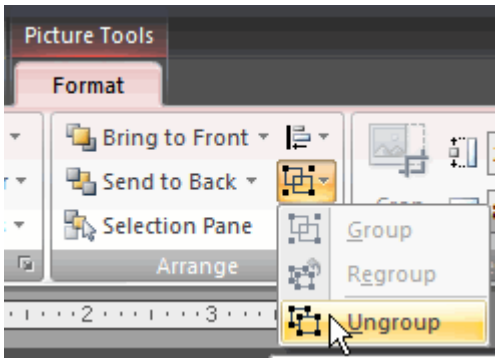
- The selected objects will become **grouped into one object**. This is indicated by the box with sizing handles that includes all the selected objects.

To Move the Grouped Object:

- **Click** and **drag** the object to a new location on the slide. The cursor will become a four-arrow cross.
- Release the mouse button.

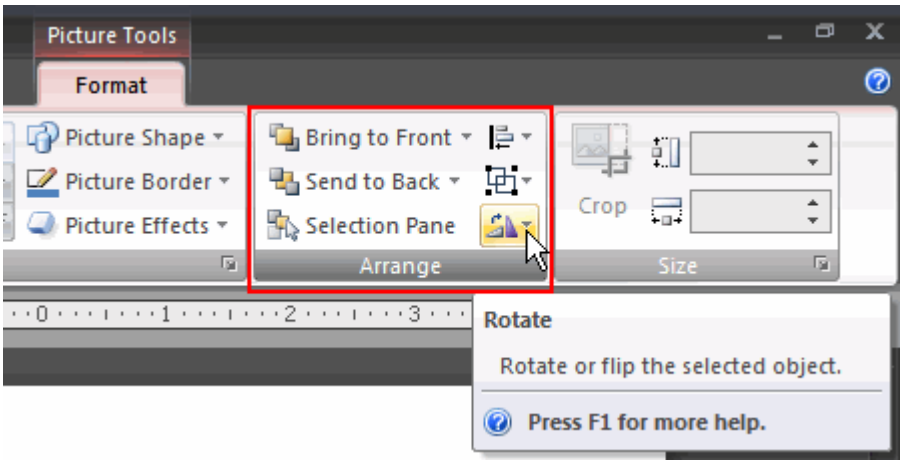
To Ungroup Objects:

- Select the grouped object you wish to ungroup. The Format tab will appear on the Ribbon.
- Select the **Format** tab.
- Click the **Group** command in the Arrange group.
- Select **Ungroup** from the menu. The grouped object will appear as separate objects.

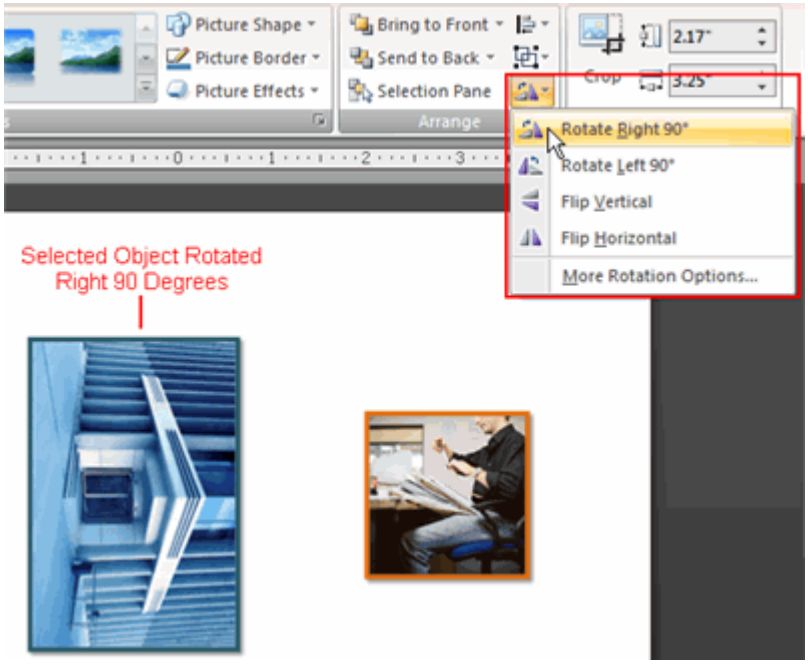


To Rotate an Object:

- Select the object you wish to **rotate**. The Format tab will appear on the Ribbon.
- Select the **Format** tab.
- Click the **Rotate** command in the Arrange group.



- Hover over a menu option to see a live preview of the rotation option on the slide.

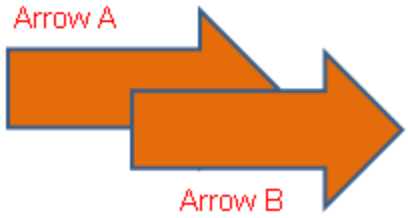


- Select an option from the menu.

Order Objects

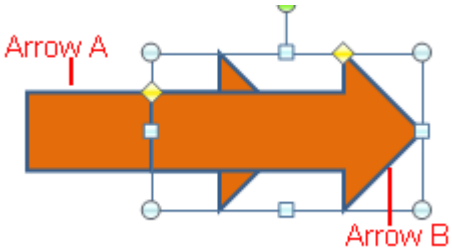
In addition to aligning and grouping objects, PowerPoint gives you the ability to **arrange objects** in a **specific order**. When you insert objects such as shapes and pictures onto a slide, each object is arranged **based on the order it was inserted**.

For example, if I insert Arrow A and then insert Arrow B, Arrow A will appear beneath Arrow B if I drag the objects so they are stacked on top of each other. This is because Arrow A was inserted before Arrow B. The same is true for other objects such as pictures and text boxes, or a combination of objects. At times you may want to **arrange the objects** in a different **order**.



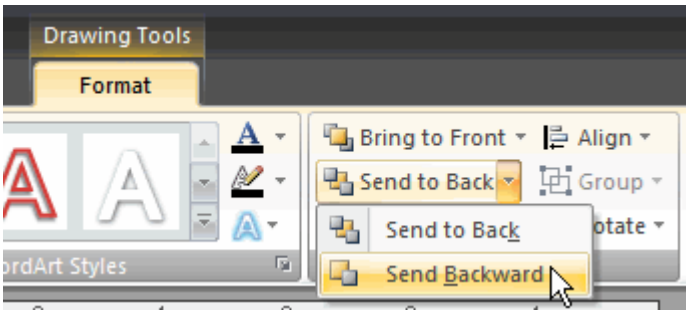
To Order Objects Using the Send to Back Command:

- Select the object you want to arrange in a different order. In this example, the tail of Arrow B needs to appear below the head of Arrow A. I can select either arrow, but I'll select Arrow B.

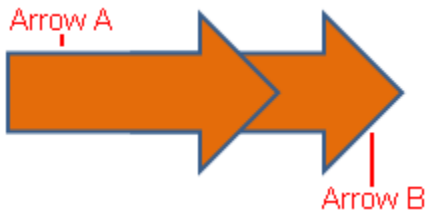


- Select the **Format** tab.
- Click the **Send to Back** command.
- Select **Send to Back** or **Send Backward** from the menu.

- **Send to Back** sends the selected object to the very back, or very bottom layer, of the stack of objects.
- **Send Backward** sends the object back one layer.

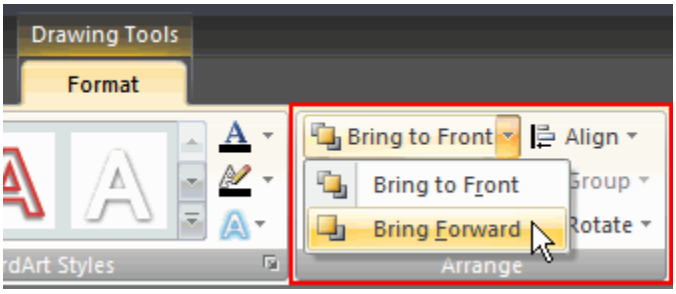


- The objects will appear in the new order.



To Order Objects Using the Bring to Front Command:

- Select the object you want to arrange in a different order.
- Select the **Format** tab.
- Click the **Bring to Front** command.
- Select **Bring to Front** or **Bring Forward** from the menu.
  - **Bring to Front** sends the selected object to the front of the the stack of objects so that it appears on the top layer.
  - **Bring Forward** send the object forward one layer.



- The objects will appear in the new order.

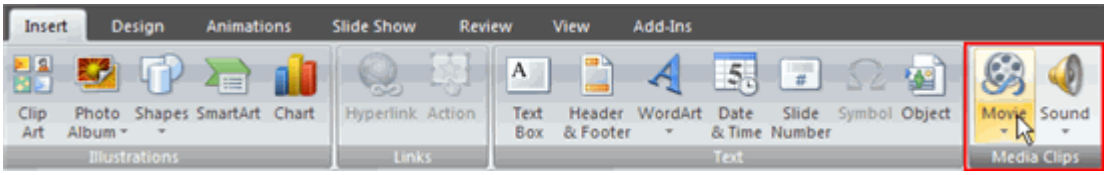
Inserting Movies

You may want to **insert a movie** into your PowerPoint presentation. You can insert a movie from a file on your computer or from the Microsoft Office clip organizer. In addition, PowerPoint gives you many options to define how the movie will operate in the presentation.

Inserting Movie From a Computer File

To Insert a Movie from a File on Your Computer:

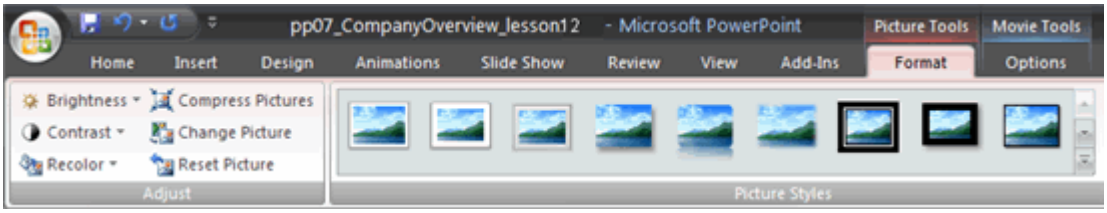
- Select the **slide** where you wish to insert the movie.
- Select the **Insert** tab.
- Click the drop-down arrow on the **Movie** command in the **Media Clips** group.



- Select **Insert a Movie from File** from the menu. The Insert Movie dialog box will appear
- Locate the file you want to insert from your computer.
- Click the file name.
- Click **OK**. The movie will appear on the slide. The Movie Tools Options tab and Picture Tools Format tab appears on the Ribbon when the movie is inserted.
- A dialog box will appear. Click **Automatically** or **When Clicked**. Automatically will start the movie automatically as soon as the slide appears in slide show view and When Clicked will start the movie when you click.

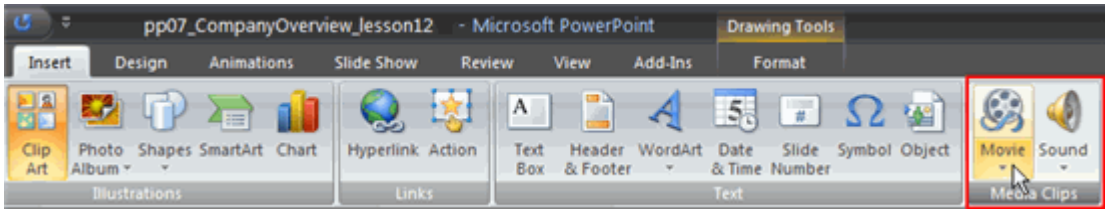
Sizing handles are located around the movie. Click, drag, and then release the resizing handles to resize the movie. The sizing handles work the same as with pictures, text boxes, and shapes.

If a slide layout has a content placeholder, click the **Insert Media Clip** command to insert a movie located on your computer.

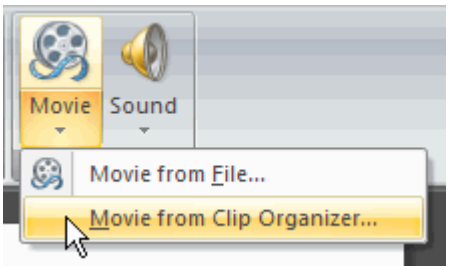


Inserting Movie Clips

To Insert a Movie from the Clip Organizer:

- Select the **slide** where you wish to insert a movie clip.
- Select the **Insert** tab.
- Click the **Movie** command in the Media Clips group.
- 

- Select **Movie from Clip Organizer** from the menu. The Clip Art task pane will appear on the right.



- Enter keywords in the search field.
- Click **Go**. Movie clips that meet the keyword search will appear in the task pane.
- Click a clip to insert it. The clip will appear on the slide.

Movies in the clip organizer are similar to animated picture files. You can select Office Online at the bottom of the Clip Art task pane to view additional movie clips.

To Delete a Media Clip:

- Select the movie from your computer or the clip organizer.
- Click the **Delete** key.

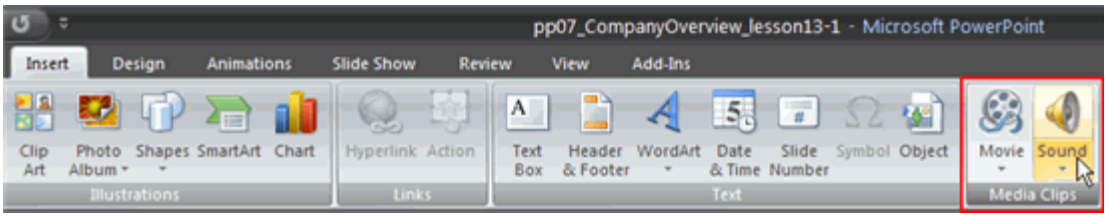
Inserting Sound

PowerPoint allows you to **add sound** to your presentation in several different ways. You can do this using a sound file **on your computer**, choose from hundreds of sounds available through the **clip organizer**, or play tracks from an **audio CD**. Do you want the music to play through the entire presentation? Or would you prefer the music only to play on one slide? PowerPoint not only allows you to use sound, but allows you to customize sound options so you can play the sounds you want, the way that you want.

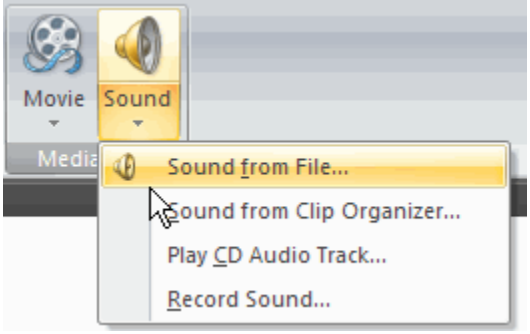
Sounds on File

To Insert a Sound File from Your Computer:

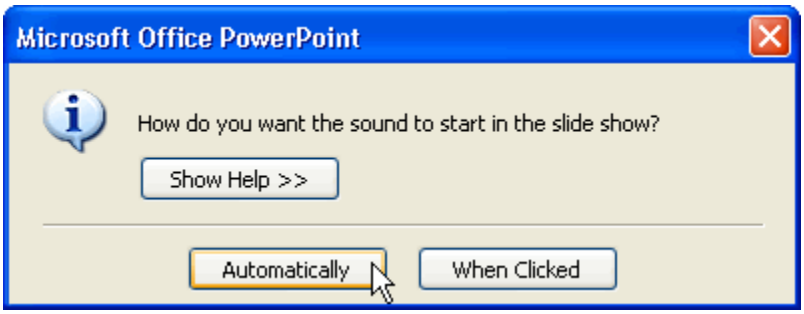
- Select the slide where you want to add sound
- Select the **Insert** tab.
- Click the drop-down arrow on the **Sound** command in the Media Clips group.



- Select **Sound from File** from the menu. The Insert Sound dialog box will appear.



- Locate the sound file on your computer.
- Select the file.
- Click **OK**. A sound icon and a dialog box will appear.
- Select **Automatically** or **When Clicked**. Click **Automatically** or **When Clicked**. Automatically will start the sound automatically as soon as the slide appears in slide show view and When Clicked will start the sound when you click.

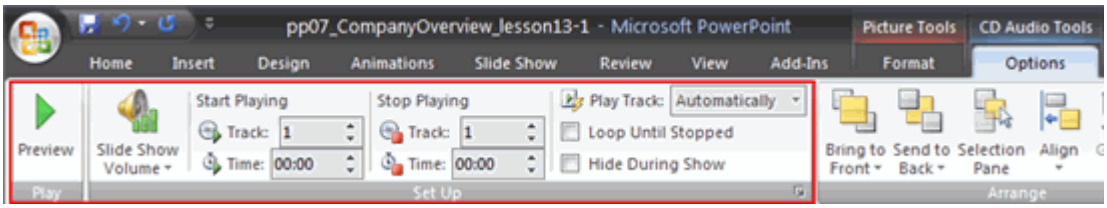


Click, drag, and release the button to move the sound icon to a different location on the slide.

To add sound from a CD, you must have a music CD inserted into your computer's CD-ROM drive.

CD Audio Tools Options

Once you have inserted tracks from a CD, a CD Audio Tools Options tab appears. Many of the commands are similar to the commands available when you insert other sounds; however, some of the options are different.



In the Play and Setup groups you can:

- **Preview**: Listen to the sound that will play.
- **Slide Show Volume**: Change the volume to low, medium, high, or mute.
- **Edit the Track and Time fields**: change the tracks that play and the time in the track that playback starts or stops.
- **Change How to Play Track:** Click the drop-down menu next to Play Track to change whether the CD tracks play automatically or when clicked.
- **Hide During Show**: Hide or display the sound icon during the slide show.
- **Loop Until Stopped**: Sound will play until you stop it by clicking or advancing to the next slide.

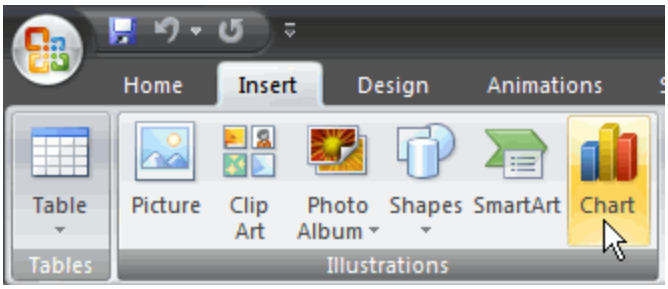
Working with Charts

A **chart** is a tool you can use to communicate your **data graphically**. Charts often help an audience to see the meaning behind numbers and make showing comparisons and trends easy. In this lesson, you will learn how to **insert** and **modify** charts and see how they can be an effective tool for communicating information.

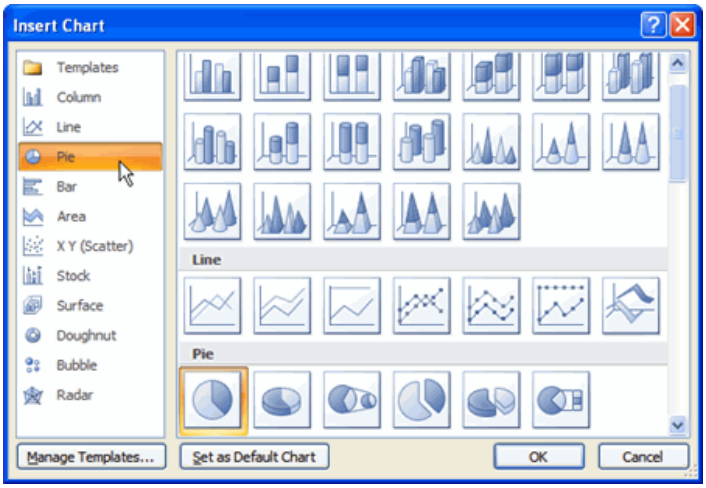
Inserting Charts

To Insert a Chart:

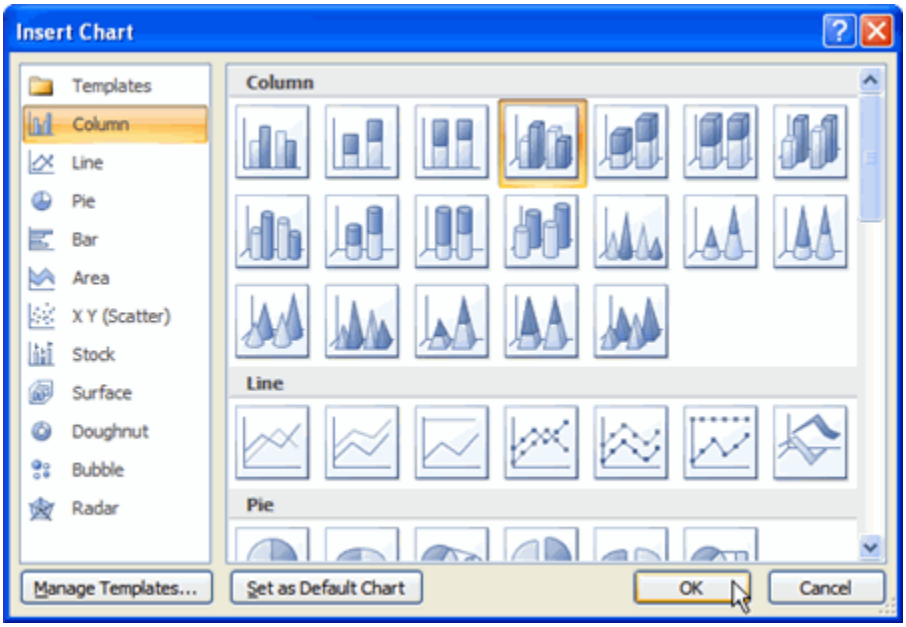
- Select the **Insert** tab.
- Click the **Insert Chart** command. The **Insert Chart** dialog box appears.



- Click and drag the **scroll bar** to view the chart types, or click a **label** on the left of the dialog box to see a specific chart style.



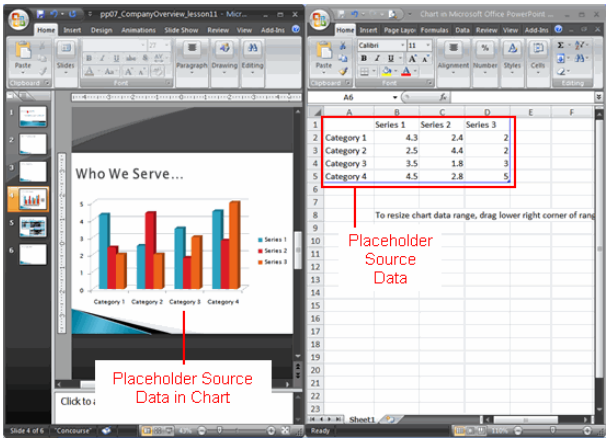
- Click a chart to select it.
- Click **OK**. Excel will open. Usually, Excel will appear on one side of the screen, while PowerPoint appears on the other side of the screen.



If a slide layout has a content placeholder, click the **Insert Chart** command to insert a new chart.

Enter Chart Data

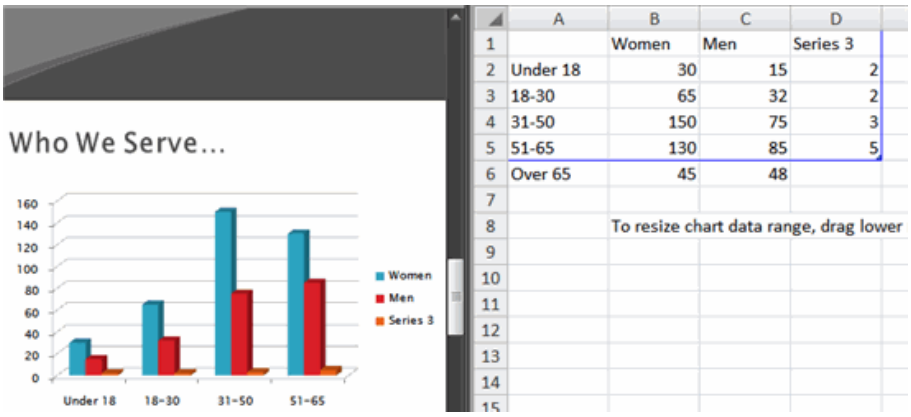
The data that appears in the Excel spreadsheet is **placeholder source data** that you will replace with your own information. The Excel source data is used to create the PowerPoint chart.



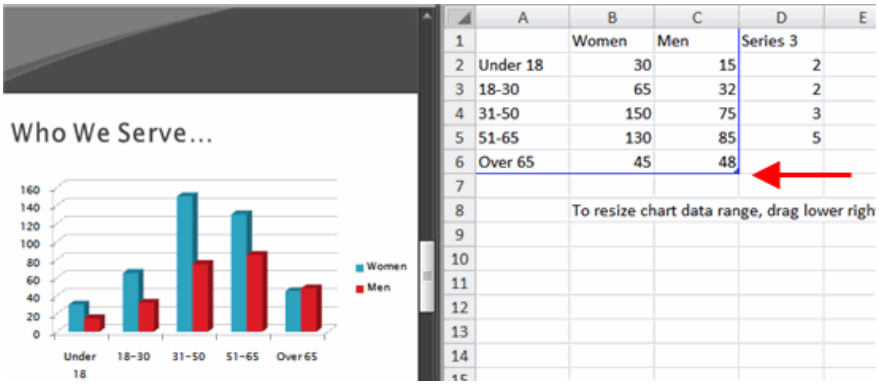
To Enter Chart Data:

- Select a **cell** in the Excel spreadsheet.

- Enter your **data** in the cell. If the cell contains placeholder data, the placeholder data will disappear. As you enter your data, it will appear in the Excel spreadsheet and the PowerPoint chart.
- Move to another cell.
- Repeat the above steps until all your data is entered.



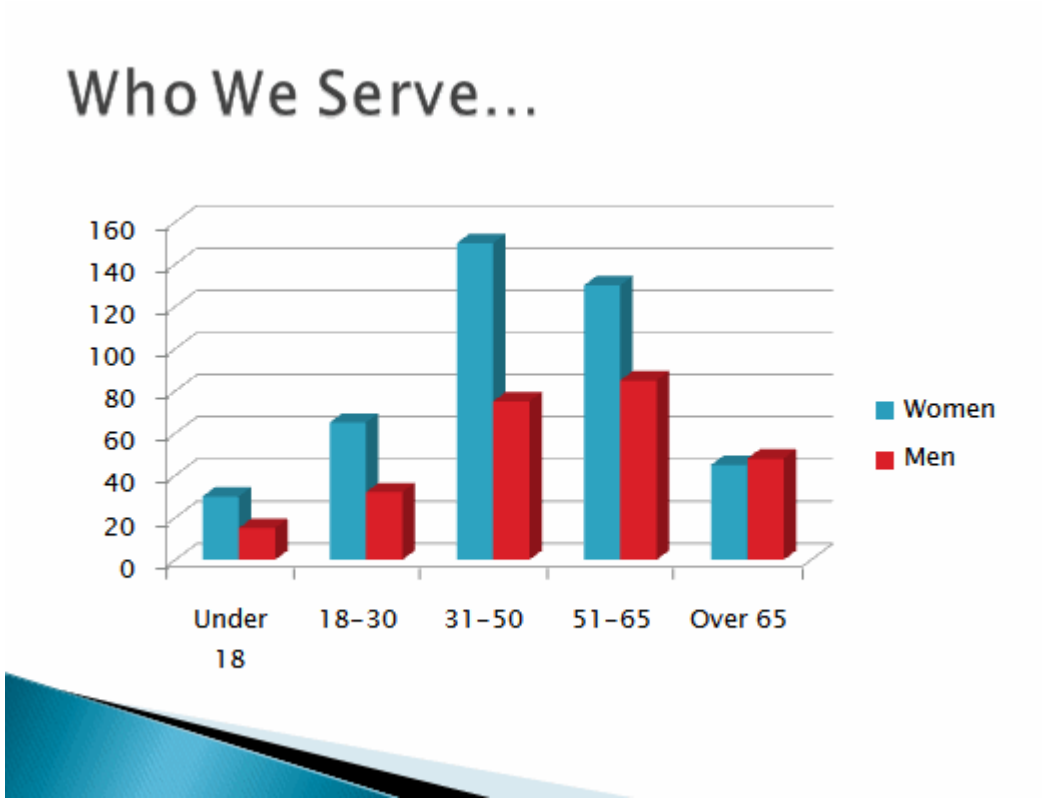
- Click and drag the **lower-right corner** of the **blue line** to increase or decrease the **data range** for columns. The data enclosed by the blue lines will appear in the chart.
- Click and drag the **lower-right corner** of the **blue line** to increase or decrease the **data range** for rows.



- Select any cells with placeholder data remaining. In the example, the column with Series 3 data was not needed.

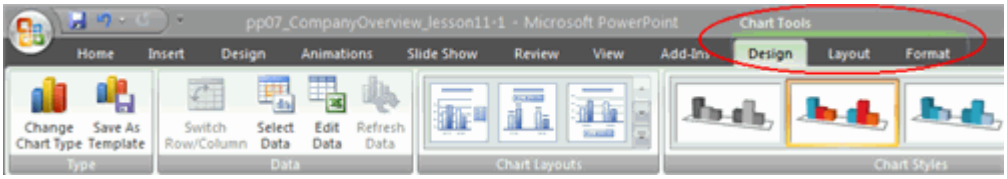
	A	B	C	D
1		Women	Men	Series 3
2	Under 18	30	15	2
3	18-30	65	32	2
4	31-50	150	75	3
5	51-65	130	85	5
6	Over 65	45	48	
7				

- Press the **Delete** key to delete the remaining placeholder data.
- Close Excel. You **do not** need to save the spreadsheet. The new Excel source data appears in the PowerPoint chart.



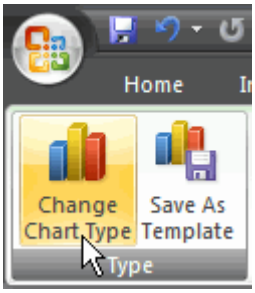
Formatting Chart

When you insert a chart, three new tabs will appear on the Ribbon. The three tabs -- **Design**, **Layout**, and **Format** -- contain various chart tools and commands that allow you to modify and format the chart.

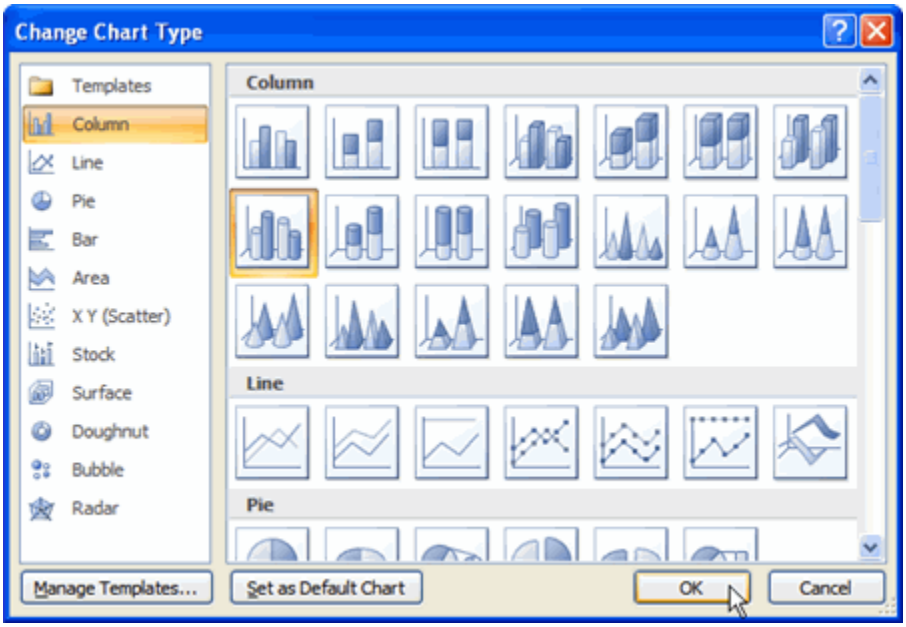


To Change the Chart Type:

- Select the chart.
- Select the **Design** tab.
- Click the **Change Chart Type** command. The Insert Chart dialog box will appear.

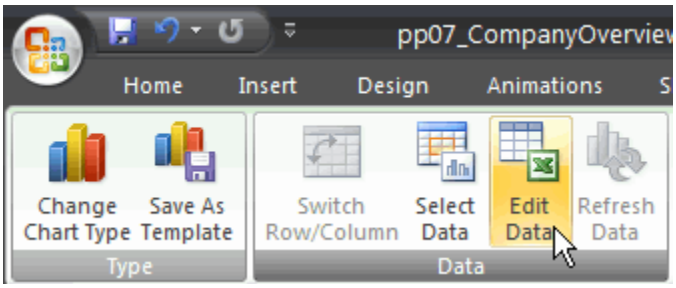


- Select the chart you would like.
- Click **OK**. The chart will change on the slide to the new chart type.



To Edit Source Data:

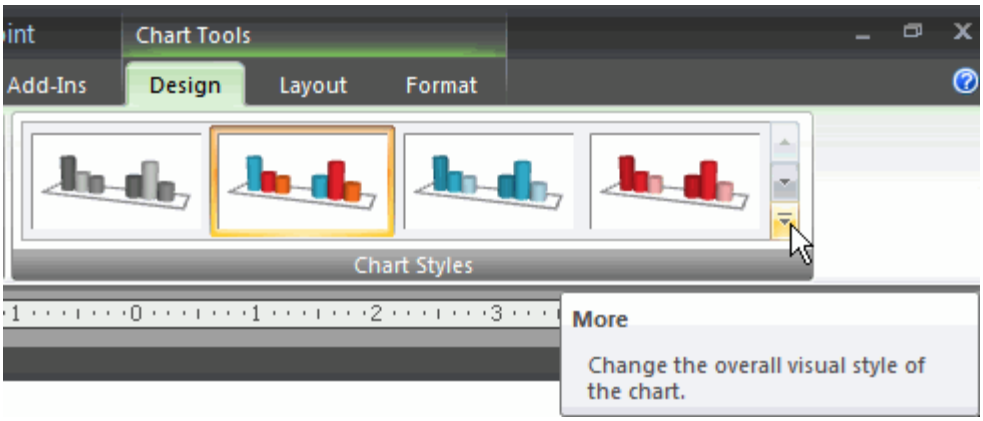
- Select the chart.
- Select the **Design** tab.
- Click the **Edit Data** command. An Excel spreadsheet with the current source data will appear.



- Edit the data in the spreadsheet. The changes will appear on the slide.
- Close Excel without saving the spreadsheet.

To Change the Chart Style:

- Select the chart.
- Select the **Design** tab.
- Scroll through the options in the **Chart Style** group, or click the **More** drop-down arrow to see all the chart style options.



- Click a **chart style** to select it. The chart style will change on the slide.

Self Assessment

1. Start Microsoft PowerPoint and create a presentation to introduce novice computer users to PowerPoint

2. Insert Pictures and Graphs into your presentation

3. Applying formatting to your presentation

CHAPTER TEN

VIEWING AND PRINTING SLIDES

Introduction

Once you finish creating the slides, you may want to **view** your presentation to make sure all the slides appear how you want. PowerPoint gives you the ability to view the presentation in four different ways, depending on what task you are completing. For example, if you will be using your slides to talk to an audience, which is how PowerPoint is often used, you may want to practice your presentation and view your slides in slide show view.

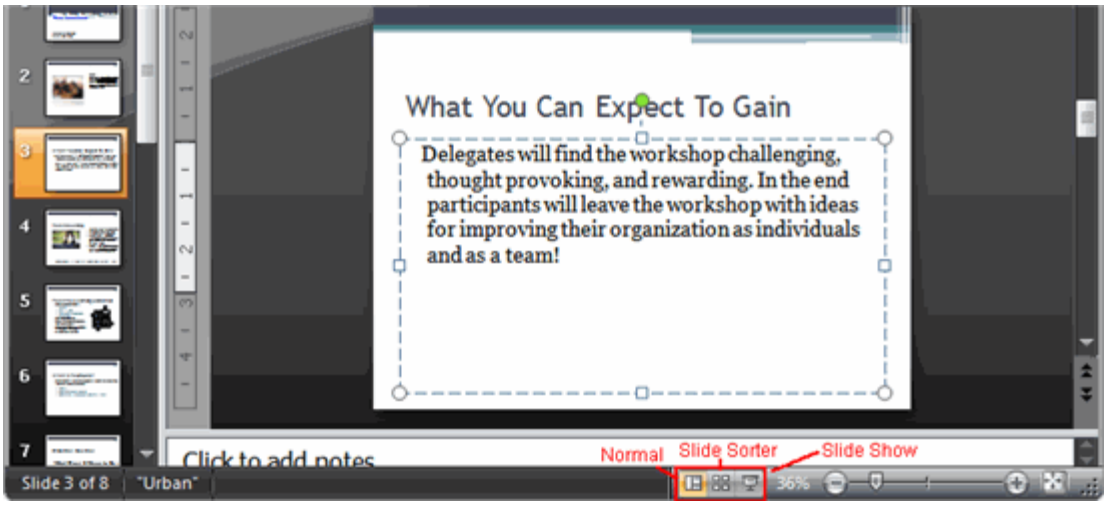
You may also want to **print** copies of the slides, either for yourself, or for people viewing your presentation. You have several printing options that are specific to PowerPoint.

SLIDE VIEWS

Type Of Slide Views

It is important that you be able to access the different PowerPoint slide views and use them for various tasks. **Three of the four views** are visible from the default view, Normal. The **slide view commands** are located on the bottom, right side of the PowerPoint window in Normal view. Click a view command to switch to that view.

Normal View: This view is where you create and edit your slides. You can also move slides in the Slides tab on the task pane on the left.



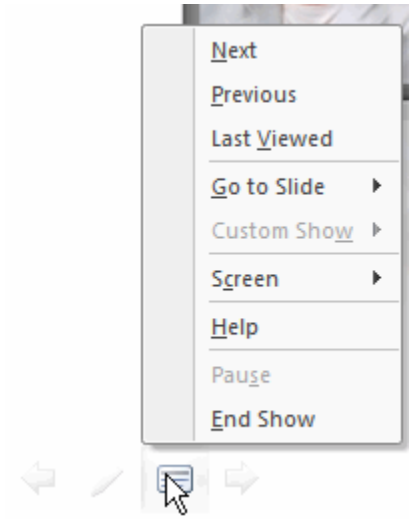
Slide Sorter View: Miniature slides are arranged on the screen in this view. You can drag and drop slides easily to reorder them, and see more slides at one time. This is a good view to use to confirm that you have all the needed slides and that none have been deleted.

Slide Show View: This view fills the computer screen with a slide and is what the audience will see when they view the presentation. The slide show view has an additional menu that allows you to navigate through the slides, as well as other features you can use during a presentation.

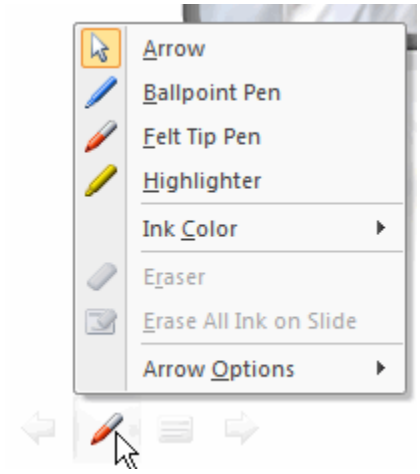
Use the arrow keys, Page Up and Page Down keys, space bar, and Enter key to move through the slides in slide show view. Press the Esc key to end a slide show.

The Slide Show Menu

Menu Icon: Click the menu icon and a menu appears that gives you the option to move to the Next or Previous slide, jump to a specific slide, change your screen options, or end the show.



Pen Icon: Click the pen icon and a menu appears that allows you to change your cursor to a ball point pen, a felt tip pen, or a highlighter, and choose the color of the pen. This allows you to annotate your slides and make notes while you present to an audience.



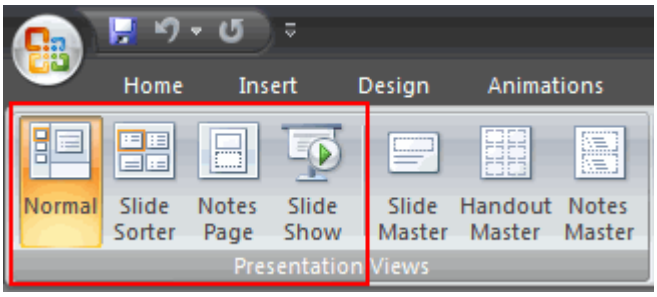
Notes Page View

The fourth view is Notes Page view. It is not one of the view commands included at the bottom of the Normal View; however, it can be accessed from the View tab. Notes Page view provides a space for presentation notes, often called speaker notes. The notes can be added to the presentation from this view. You can enter your speaker notes directly into the text placeholder in Notes Page view, or in Normal view, you can enter your notes in the area below the slide.

To Change to Notes Page View:

- Select the **View** tab.

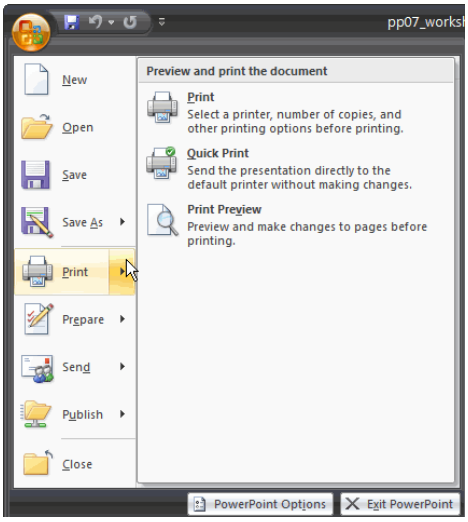
- Locate the **four view commands** on the left side of the Presentation Views group.



- Click **Notes Page View**.

Printing Slides

You may want to **print** copies of your slides for the people who view your presentation or for yourself. There are three print options available from the Microsoft Office Button menu -- **Print**, **Quick Print**, and **Print Preview**.

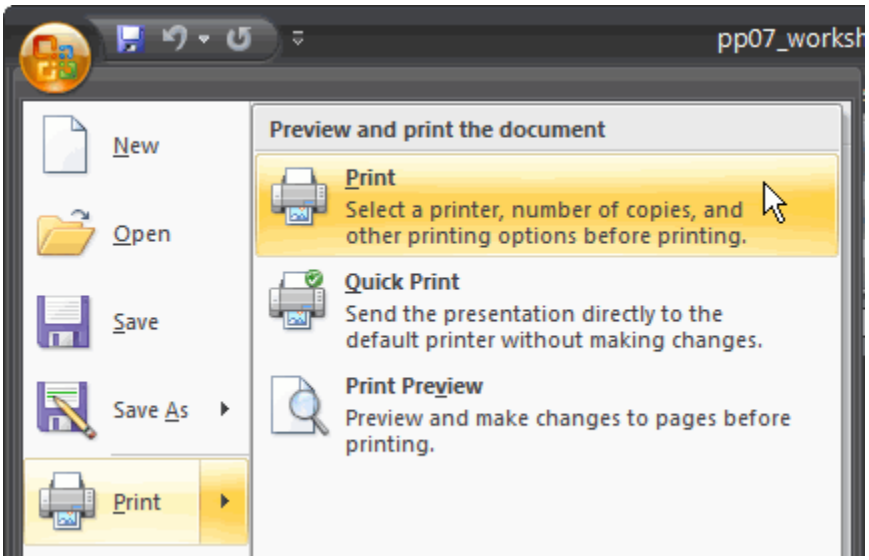


To Use Print Preview:

- Click the **Microsoft Office Button**.
- Select **Print** → **Print Preview**. The presentation opens in Print Preview format.
- From here you can view each slide in grayscale, make decisions about whether to print the slides individually or as handouts, choose options, and more.

To Print:

- Click the **Microsoft Office Button**.
- Select **Print** → **Print**. The Print dialog box appears.



- Select the **printer** you would like to use, if you have more than one printer.
- Click **Properties**. From here you can make choices about paper size and whether to print double-sided. These options vary from printer to printer.
- Enter a **print range**.
    - Leave the default setting, **All**, selected, or click **Slides**.
    - The field beside it will become active and you can enter the slide numbers of the slides you want to print.
- Decide what you want to print -- slides, handouts, notes pages, or an outline.
    - Handouts print many slides per page. The default is 6, but you can change that to 3 and have room for the person to take notes, or set another amount of slides per page.
    - Choose horizontal or vertical slide layout, if given the option.
    - You can print Notes Pages, if you typed speaker notes for the slides.
    - Choose to print in **grayscale** or **color**.
- Choose the **number of copies** to print.
- Click **OK**.

Self Assessment

1. Explain the function of each of the slide views.

2. Give the steps that you will use to print note pages.

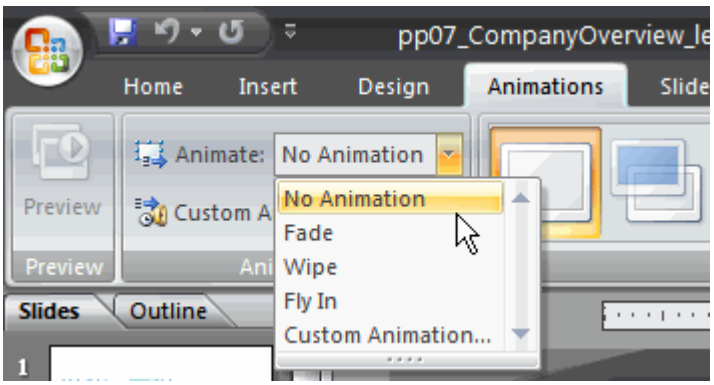
ANIMATING TEXT AND OBJECTS

In PowerPoint you can **animate** text and **objects** such as clip art, shapes, and pictures on the slide. Animation, or movement, on the slide can be used to **draw** the **audience's attention** to specific content or to make the slide easier to read.

Applying Animation Effects

To Apply a Default Animation Effect:

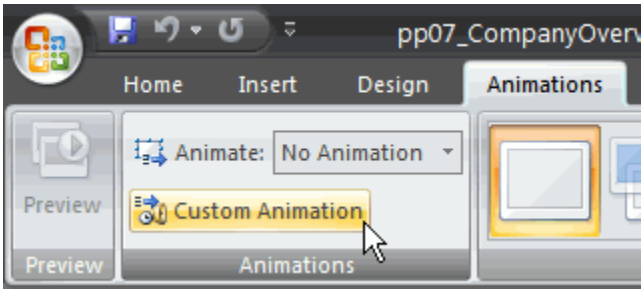
- Select the **text** or **object** on the slide you wish to animate.
- Select the **Animations** tab.
- Click the **Animate** drop-down menu in the Animations group to see the **animation options** for the selection. The options change based on the selected item.



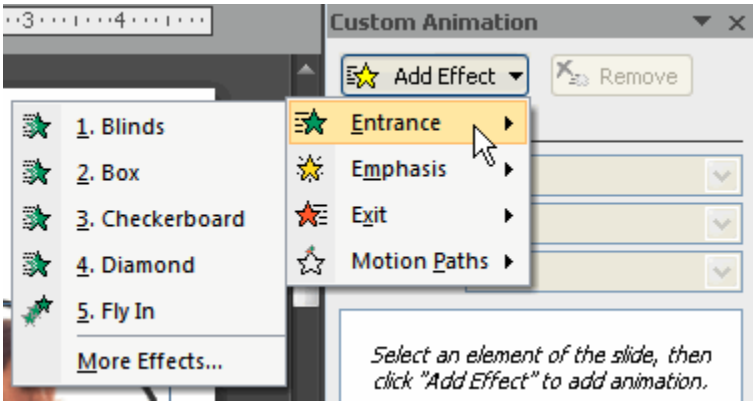
- Move your cursor over each option to see a live preview of the animation on the slide.
- Click an option to select it.

To Apply a Custom Animation Effect:

- Select the **text** or **object** on the slide you wish to animate.
- Select the **Animations** tab.
- Click **Custom Animation** in the Animations group. The Custom Animation task pane will appear on the right.



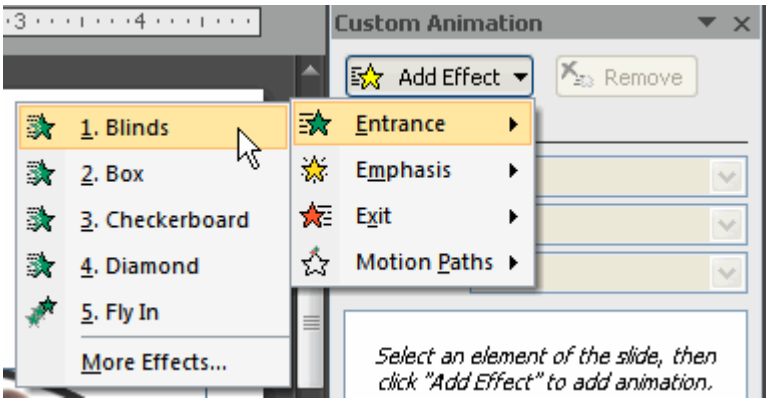
- Click **Add Effect** in the task pane to add an animation effect to the selected text or object.
- Select **Entrance**, **Emphasis**, **Exit**, or **Motion Path** to display a sub menu of animation effects for the category.



  - Entrance animation effects: Changes how the selected item appears on the page
  - **Emphasis** animation effects: Draws attention to the selected item while the slide is displayed

- **Exit** animation effects: Changes the way the selected item disappears from the slide
- **Motion Path** animation effect: Animates the selected item so that it moves to a specific place on the screen

- Select an **animation effect** to apply it.



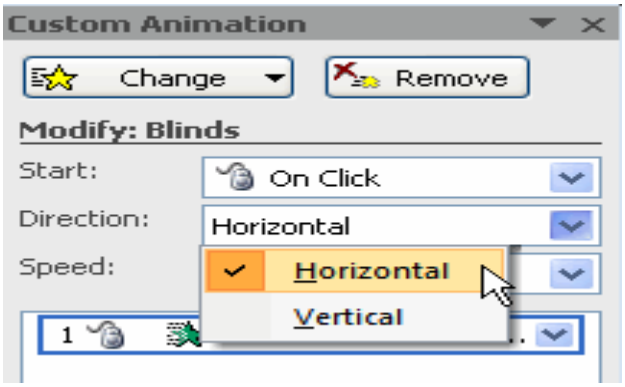
- The animation will display on the selected item on the slide and will appear listed in the Custom Animation task pane.
    1. A **number label** appears **on the slide** next to the animated object . Also, a matching number label appears next to the animation in the Custom Animation **task pane list**.
    2. **Drop-down menus** appear **at the top** of the Custom Animation **task pane**. You can define the animation effect in greater detail here.
    3. The star **Play Animations** icon appears beneath the slide on the Slides tab in the task pane on the left. It indicates that the slide has an animation effect.

Select **More Effects** or **More Motions Paths** from the menu to see more animation effect options.

Working With Animation Effects

To Modify a Default or Custom Animation Effect:

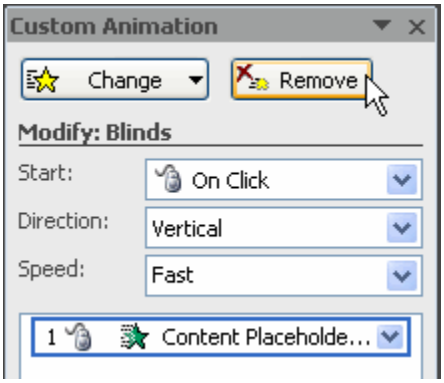
- After you apply an animation effect, **drop-down menus** will appear at the **top** of the Custom Animation task pane. The menus vary based on the animation effect.
- Select an option from a drop-down menu to **change** the **default** setting.



- Repeat until all menu options are the desired setting.

To Remove an Animation Effect:

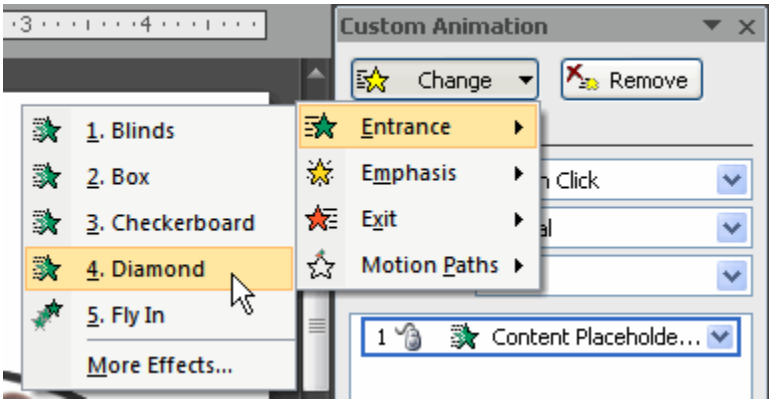
- Select the **text** or **object** on the slide you wish to modify.
- Select the **Animations** tab.
- Click **Custom Animation** in the Animations group. The Custom Animation task pane will appear on the right.
- Select the animation in the Custom Animation task pane list, if it is not already selected.
- Click **Remove**. The animation label will disappear from the slide and from the Custom Animation task pane list.



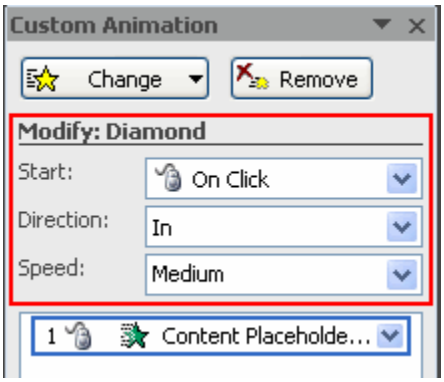
To Apply a Different Animation Effect:

- Select the **text** or **object** on the slide you wish to modify.
- Select the **Animations** tab.

- Click **Custom Animation** in the Animations group. The Custom Animation task pane will appear on the right.
- Select the animation in the Custom Animation task pane, if it is not already selected.
- Click **Change**.
- Select an **Entrance**, **Emphasis**, **Exit**, or **Motion Path** animation effect.



- New drop-down menus with default settings will appear at the top of the Custom Animation task pane.



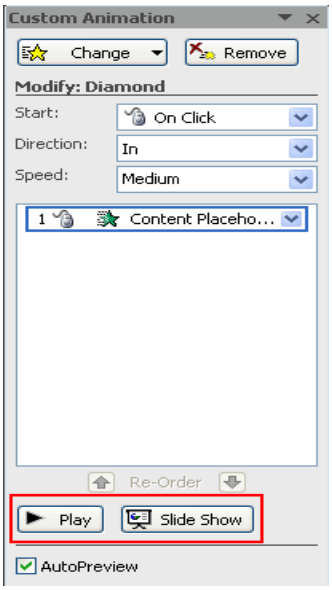
To Preview an Animation Effect:

- Select the **text** or **object** you wish to modify on the slide.
- Select the **Animations** tab.
- Click **Custom Animation** in the Animations group. The Custom Animation task pane will appear on the right.
- Select the animation in the Custom Animation task pane list.

- Click **Play** at the bottom of the task pane to see a **preview** of the animation **in Normal view**

  OR

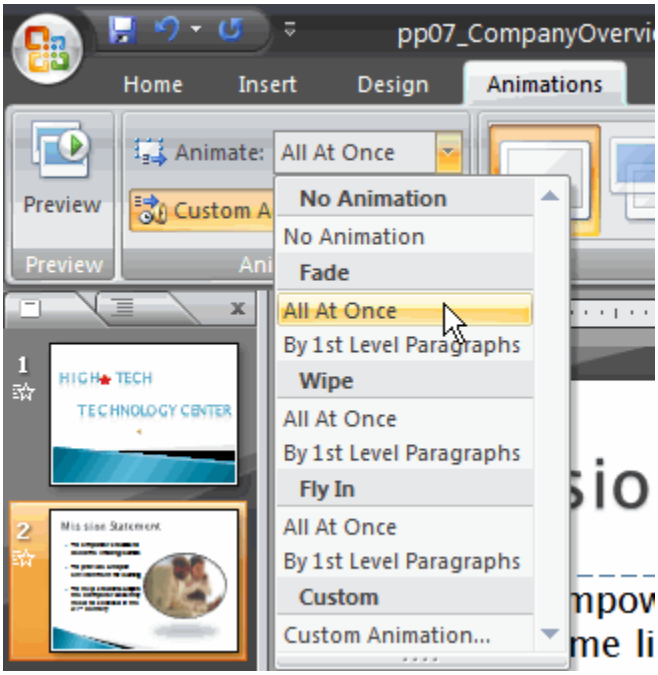
- Click **Slide Show** to see the animation **in Slide Show view**. Press the **Esc** key to return to Normal view.



Working with Animation Effects

To Animate Text with a Default Animation:

- Select the text box or text you wish to animate on the slide.
- Select the **Animations** tab.
- Click the **Animate** drop-down menu in the Animations group to see the **animation effects** for the selected text. The effects vary based on the selected item.
- Select an animation effect.

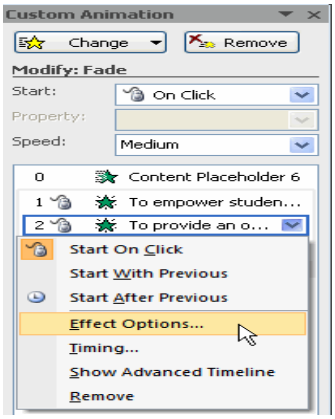


- **All at Once**: The selected text appears all at once. The entire text is labeled with **one number** on the slide. Click the drop-down arrow in the task pane to expand the contents and see that the text is labeled with one number.

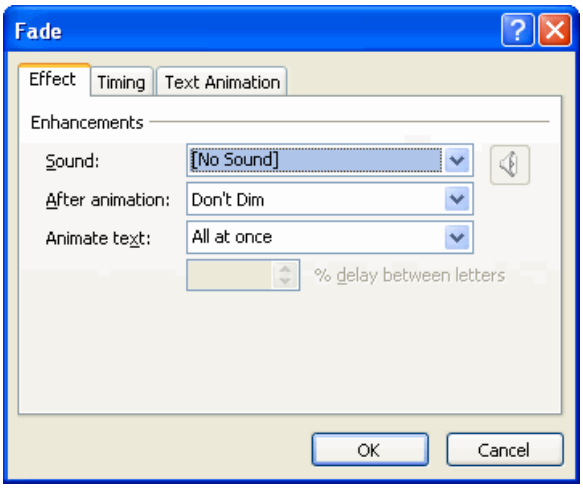
- **By 1st Level Paragraphs** The text will appear bullet by bullet, or paragraph by paragraph. **Each level** of text is labeled with a **different number** on the slide. Click the drop-down arrow in the task pane to expand the contents and see that the text is labeled with multiple numbers.

More Ways to Modify an Animation Effect

- Select an animation effect in the Custom Animation task pane list.
- Click the arrow to display a drop-down menu.



- Select **Effects Options** or **Timing**. A dialog box will appear.
- In the dialog box, add enhancements such as sounds and define what happens after the animation effect is applied to the selected item.

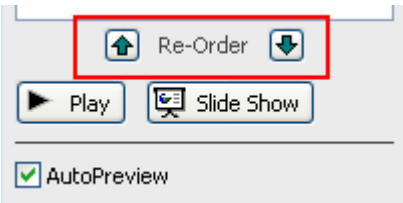


The dialog box name is based on the animation effect name. In the example above, the animation effect is **Fade**. The tabs and the options on the tabs will vary based on the animation effect that is being modified.

To Reorder Animation Effects:

- Select the **Animations** tab.
- Click **Custom Animation** in the Animations group.

- Select the animation effect you want to move in the Custom Animation task pane list.
- Click the **arrows** at the bottom of the task pane to reorder the selected animation effect.



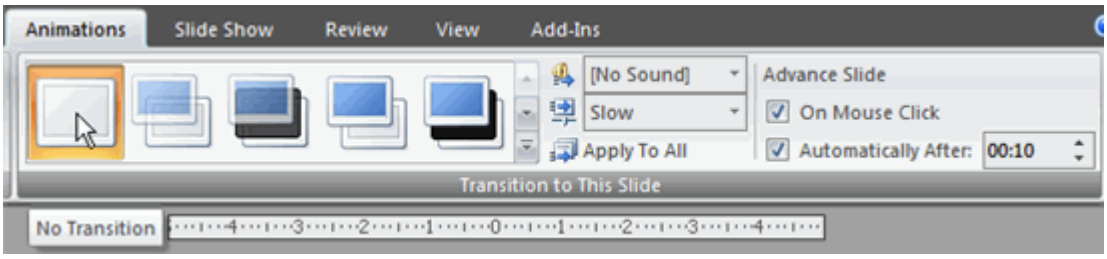
Using Transitions

Transition effects, or **transitions** as they are often called, are the movements you see when one slide changes to another in slide show view. Transition effects are different from animation effects. The term animation in PowerPoint refers to the movements of text and objects on the slide, while **transitions** refer to the movement of the slide as it changes to another slide.

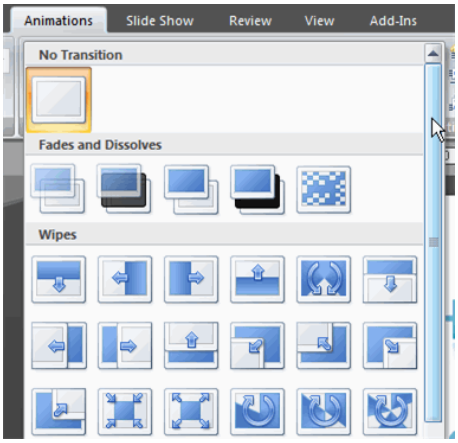
Applying Transitions

To Apply a Transition to One Slide:

- Select the **slide** you wish to modify.
- Select the **Animations** tab.
- Locate the **Transition to This Slide** group. By default, **No Transition** is applied to each slide.



- Click the **More** drop-down arrow to display all the transition effects.

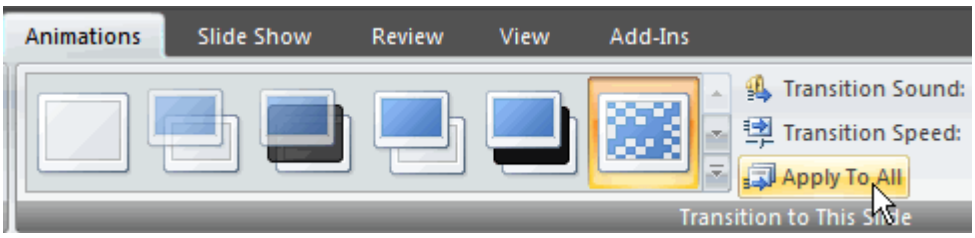


- Click a **slide transition effect** to apply it to the selected slide.

Hover over a slide transition effect to see a live preview of the effect on the slide.

To Apply a Slide Transition All Slides:

- Select the **slide** you wish to modify.
- Select the **Animations** tab.
- Locate the **Transition to This Slide** group. By default, **No Transition** is applied to each slide.
- Click the **More** drop-down arrow to display all the transition effects.
- Click a **slide transition effect** to apply it to the selected slide.
- Click **Apply To All** to apply the transition to all the slides in the presentation.

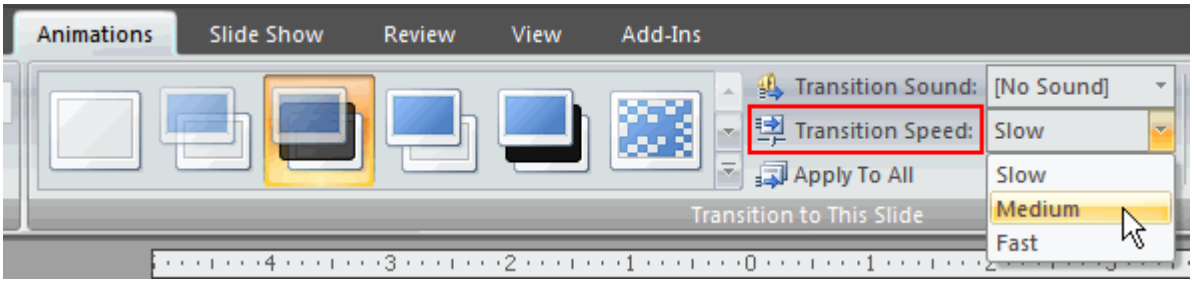


A star **Play Animations** icon will appear beneath any slide that has a transition effect applied to it, as well as any slide that uses animation effects for text or objects. The icon is visible on the Slides tab in the task pane on the left and in slide sorter view. Click the star Play Animations icon to preview the animation or transition effect.

Modifying a Transition

To Set Slide Transition Speed:

- Apply a **slide transition effect** to a slide.
- Click the **Transition Speed** drop-down menu in the Transition to This Slide group on the Animations tab.
- Select a menu option to apply the transition speed to the selected slide.



You can set the transition speed when you apply the transition effect, or return to the Animations tab and apply it later. If you wish to apply the transition effect and transition speed to all slides Click **Apply to All**.

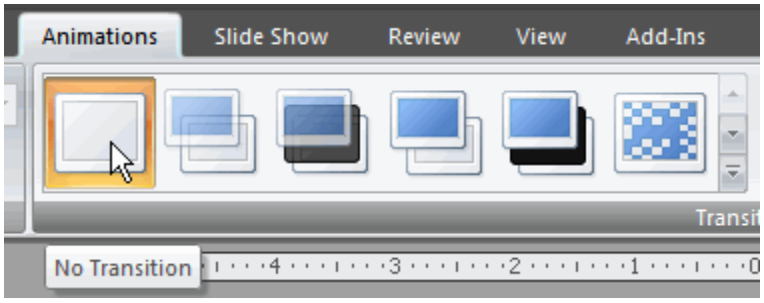
To Set Slide Transition Sound:

- Apply a **slide transition effect** to a slide.
- Click the **Transition Sound** drop-down menu in the Transition to This Slide group on the Animations tab.
- Select a **sound** to apply it to the selected slide.

Click **Apply To All** if you wish to apply the transition effect and transition sound to all slides.

To Remove a Slide Transition Effect:

- Select the **slide** you wish to modify.
- Select the **Animations** tab.
- Click **No Transition** in the Transition to This Slide group.

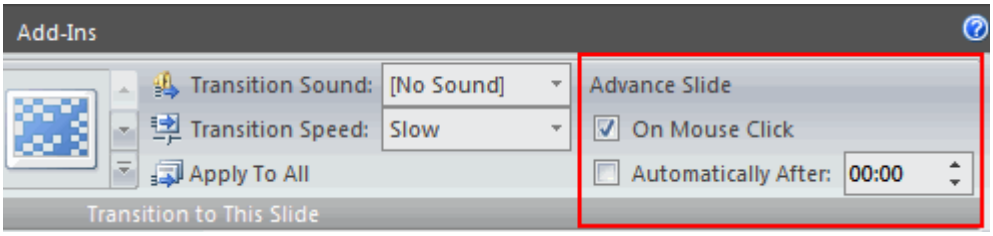


- Repeat this process for each slide you want to modify.
- OR
- Click **Apply To All** to remove the slide transition effect from each slide in the presentation.

Advancing Slides

Advancing to the Next Slide

By default, in slide show view you click your mouse to advance, or move, to the next slide. This setting is defined in the Transition to This Slide group on the Animations tab. You can modify this setting so that each slide displays for a specific period of time before automatically advancing to the next slide. This is useful for unattended presentations, such as at a trade show booth.

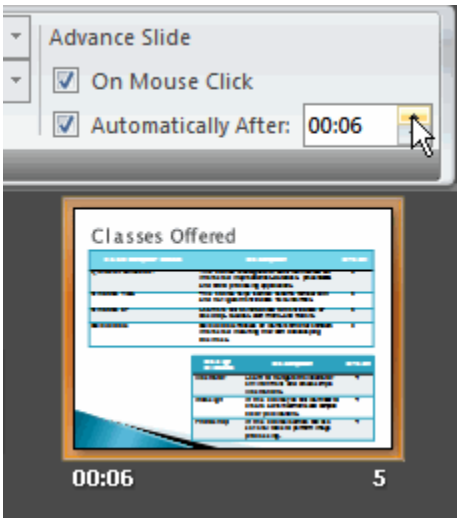


You can also advance to the next slide by pressing the Enter key.

To Set Timing for Slides:

- View the slides in **slide sorter view**.
- Select a slide.
- Select the Animations tab.
- Locate the **Advance Slide** section of the Transition to This Slide group.

- Enter the **time** in the **Automatically After** field. Use the arrows or type the number.



- Select another slide and repeat the process until all the desired slides have the timing set.

If you want to apply the same transition effect and timing for each slide, just set the transition effect timing for one slide and click Apply to All.