

## CHAPTER 5



# SPREADSHEETS

## 5.1 SPREADSHEET – AN OVERVIEW

A *spreadsheet* is a document that stores data in a grid of horizontal rows and vertical columns. Spreadsheets are primarily used to work with numbers and text. A spreadsheet is divided into a series of rows and columns to store the information. Rows are typically labeled using numbers (1, 2, 3, etc.), while columns are labeled with letters (A, B, C, etc.). Individual row/column locations, such as C3 or B12, are referred to as *cells*. In a spreadsheet application, each value sits in a *cell*. The relationships between cells are called *formulas*, and the names of the cells are called *labels*.

Once you have defined the cells and the formulas for linking them together, you can enter your data. You can then modify selected values to see how all the other values change accordingly.

Most spreadsheet applications are *multidimensional*, meaning that you can link one spreadsheet to another. A three-dimensional spreadsheet, for example, is like a stack of spreadsheets all connected by formulas. A change made in one spreadsheet automatically affects other spreadsheets. The most popular examples of this type of software are *Lotus*, *MS-Excel*.

**Note:** A spreadsheet document is often called a *worksheet*.

### 5.1.1 Features of Spreadsheet

Spreadsheet software provides all the features you need to create a professional looking spreadsheet. Some of the main features of a spreadsheet program are:

- It provides a standard grid, which may be scrolled and zoomed. Text, numeric or date values or formulas may be entered into the selected cell through the formula bar at the top of the screen.
- Cells may be formatted using the format pages, which let you specify the font style, borders, text and background colors, the size of cells and text alignment within the cells.
- Spreadsheet provides support for multiple sheets within a workbook. When you press the worksheet button, worksheets are presented in a horizontally scrollable page, allowing you to quickly flick between all the worksheets in the workbook.
- A worksheet may be selected simply by tapping on it. You can create new worksheets and delete or rename existing worksheets.
- Spreadsheet provides the ability to search the worksheet for any phrase, number or other text, letting you easily scroll between search results. It is also possible to sort a range of cells by any row or column.
- Spreadsheet supports a variety of functions used to perform basic calculations based on parameters set by the user.
- Spreadsheets can be integrated for use with other software programs. One example is a mail merge. A spreadsheet can be created with the names and addresses of various individuals, and a mail merge can be used to fill in text boxes into form letters.
- Data in spreadsheets can be displayed in a graphic form. Spreadsheets allow the numerical data in the cells to be displayed as a graph or chart.

### 5.1.2 Applications of Spreadsheet

Some of the applications of a spreadsheet program are as under:

- A spreadsheet allows users to enter and calculate numerical data.
- Using a spreadsheet greatly increases productivity for anyone who needs to manage receipts, create budgets, generate financial reports or even keep track of inventories.
- A spreadsheet is a useful tool for sorting and analyzing data.
- Complex calculations can be performed very quickly.
- Professional looking graphs and charts can be created very quickly from a range of data which allows you to view the data pictorially.
- Easy to make changes and corrections to data on the worksheet. Calculation is always accurate, provided that data and formulae entered are correct.

## 5.2 MICROSOFT EXCEL

Microsoft Excel is spreadsheet software in the *Microsoft Office Suite* widely used to perform mathematical calculations. The data is spread in a tabular form consisting of rows and columns. It provides built-in features and tools such as formulas, functions and data analysis tools that make it easier to work with large amount of data.

Spreadsheets are primarily used to work with numbers and text. A file of MS-Excel is called a *workbook* and it contains multiple *worksheets or spreadsheets*. A worksheet is divided into a series of rows and columns to store the information.

MS-Excel helps us to:

- Arrange data in an organized way
- Perform mathematical calculations
- Compare data through charts
- Sort data for better analysis
- Compare two workbooks side by side

Microsoft Excel or MS-Excel allows you to store, organize, and analyze numerical and text data. You can use this robust application to enter numerical values or data into the rows or columns of a spreadsheet, and to use these numerical entries for calculations, charts, formulas, statistical analysis, etc.

## 5.3 EXCEL 2010

*Excel 2010* is the spreadsheet software in the Microsoft 2010 Office Suite. It allows you to store, organize, and analyze numerical and text data. You can use this robust application to enter numerical values or data into the rows or columns of a spreadsheet, and to use these numerical entries for calculations, charts, formulas, statistical analysis, etc. Whether you are keeping a budget, organizing a training log, or creating an invoice, Excel 2010 makes it easy to work with different types of data.

Excel 2010 enables you to build a calculation by creating a formula that specifies the values to calculate and which mathematical operators to use to perform the calculation. Excel also offers functions - predefined formulas that perform more complex calculations.

### 5.3.1 Features of Excel 2010

Excel 2010 is a powerful tool for analyzing, sharing, and managing information to help you make more informed decisions.

Some of the important features of Excel 2010 are as under:

- **Results-oriented user interface:** Excel 2010 provides results-oriented user interface. Based on the job you need to accomplish, whether it is creating a table or writing a formula, Excel 2010 presents you with the appropriate commands.
- **Organize, and explore massive data sets within significantly expanded spreadsheets:** Excel 2010 supports spreadsheets up to 1 million rows by 16,000 columns in size eliminating the need to work within multiple spreadsheets or other applications you need to analyze large amounts of information.
- **Improved and powerful support for working with tables:** Excel 2010 has improved support for tables allowing you to create, format, expand, and refer to tables within formulae.
- **Save as XPS or PDF for easier sharing:** Convert your spreadsheet to XML Paper Specification (XPS) or Portable Document Format file (PDF) to create a fixed version of your file for easier sharing.
- **Share Spreadsheets and Business Information with Others:** Excel 2010 makes sharing spreadsheets and business information easier.
- **Communicate your analysis in professional-looking charts:** Build professional-looking charts faster with fewer clicks using charting tools in the Excel 2010 user interface.
- **Importing data from external sources:** In Excel 2010, data can be imported from external sources such as a database. Data can also be imported from formatted tables and reports, which do not have a regular grid structure.
- **Formula Auto complete:** Excel 2010 automatically suggests function names, arguments and named ranges, and automatically completing them if desired, based on the characters entered.
- **Pivot tables:** Pivot tables are used to create analysis reports out of sets of data, can now support hierarchical data by displaying a row in the table with a "+" icon, which, when clicked, shows more rows regarding it, which can also be hierarchical.

## 5.4 STARTING EXCEL 2010

To Start Excel 2010:

- Click on the **Start** button, point to **All Programs** then **Microsoft Office** and click on **Microsoft Excel 2010**.
- The first screen that you will see a new blank worksheet that contains grid of cells.

This grid is the most important part of the Excel window. It's where you will perform all your work, such as entering data, writing formulas, and reviewing the results.

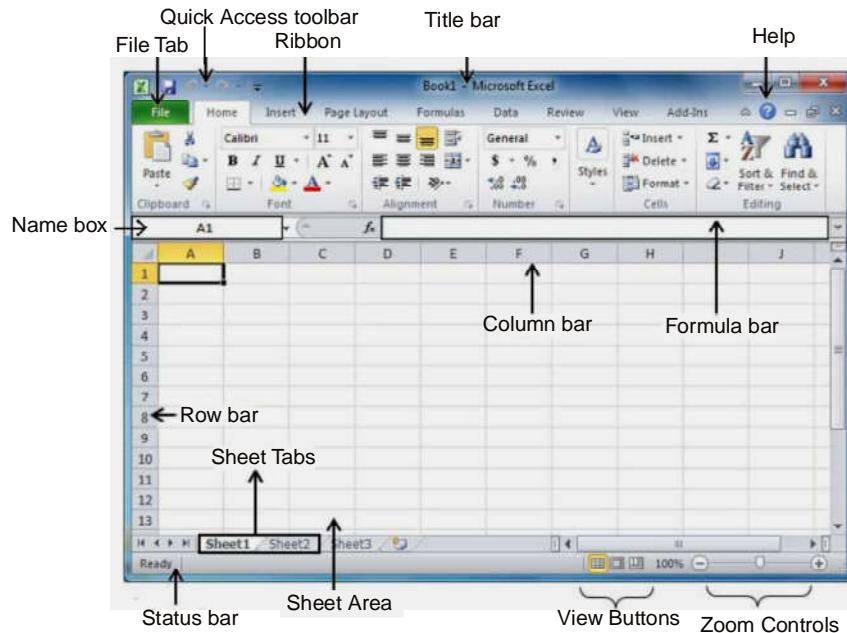


Fig. 5.1 (Microsoft Excel Window or Screen Layout)

#### 5.4.1 EXCEL 2010 SCREEN ELEMENTS

Let us discuss the various important screen elements of Excel 2010.

- **File Tab:** The *File tab* replaces the *Office button* from Excel 2007. You can click it to check *Backstage view*, which is the place to come when you need to open or save files, create new sheets, print a sheet, and do other file-related operations.
- **Quick Access Toolbar:** A small toolbar you will find just above the *File tab* contains shortcuts for some of the most common commands such as *Save*, *Undo*, and *Redo buttons*.
- **Ribbon:** A combination of old versions *menu bar* and *toolbar*, arranged into a series of tabs. Ribbon contains commands organized in three components:
- **Tabs:** Tabs appear across the top of the Ribbon and contain groups of related commands. *Home*, *Insert* and *Page Layout* are the examples of ribbon tabs.
  - (i) **Groups:** Groups organize related command. Each group name appears below the group on the Ribbon. For example: Group of commands related to fonts

(Font group) or group of commands related to alignment (Paragraph group) etc.

(ii) **Commands:** Commands appear within each group as mentioned above. For example: *Bold*, *Italic* and *Underline* are the commands appear under *Font group* of *Home tab*.

- **Title Bar:** Title bar lies at the top of the window. It shows the program and document titles.
- **Name Box:** Displays the address of the current active cell where you work in the worksheet.
- **Formula Bar:** Displays the address of the active cell on the left edge, and it also shows you the current cell's contents.
- **Sheet Tabs:** Excel 2010 contains 3 blank worksheet tabs by default. Click on the intended tab will go to the particular worksheet.
- **Status Bar:** This displays sheet information as well as the insertion point location. From left to right, this bar can contains the total number of pages and words in the document, language etc.
- **Zoom Control:** Use to zoom the Excel screen in or out by dragging the slider.
- **View Buttons:** The group of three buttons located to the left of the Zoom control, lets you switch among Excel's various sheet views.
  - **Normal Layout view:** This displays page in normal view.
  - **Page Layout view:** This displays pages exactly as they will appear when printed. This gives a full screen look of the document.
  - **Page Break view:** This shows a preview of where pages will break when printed.
- **Sheet Area:** The area where you enter data. The flashing vertical bar is called the *insertion point* and it represents the location where text will appear when you type.
- **Row Bar:** Rows are numbered from 1 onwards and keeps on increasing as you keep entering data.
- **Column Bar:** Columns are numbered from A onwards and keeps on increasing as you keep entering data. After Z, it will start series of AA, AB and so on.

## 5.5 WORKSHEET, WORKBOOK AND CELL

A *worksheet* is the grid of cells where you can type the data. The grid divides your worksheet into rows and columns.

*Columns* are identified with letters (A, B, C ...), while *rows* are identified with numbers (1, 2, 3 ...).

The worksheets in turn are grouped together into a *workbook*. By default each workbook in Excel 2010 contains 3 blank worksheets, which are identified by tabs displaying along the bottom of your screen. The first worksheet is called *Sheet1*, the next is *Sheet2* and so on as shown below:

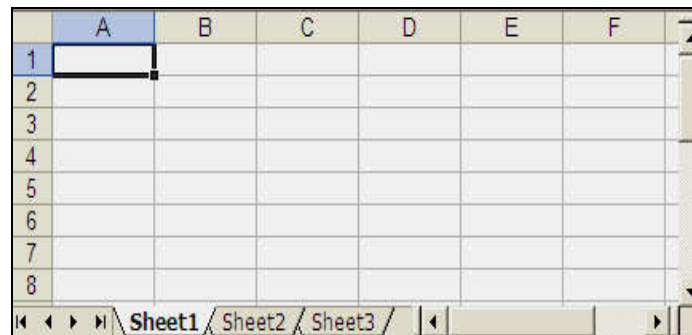


Fig. 5.2 (Worksheets in a Workbook)

*Cells* are the basic building blocks of a worksheet. Each rectangle in a worksheet is called a **cell**. A cell is the intersection of a **row** and a **column** i.e. a cell is identified by column and row.

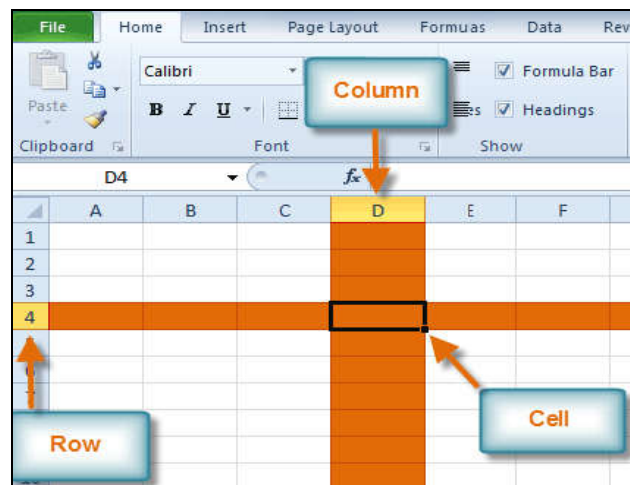


Fig. 5.3 (Cell in a Worksheet)

Each cell has a **name**, or a **cell address** based on which column and row it intersects. The cell address of a selected cell appears in the **name box**.

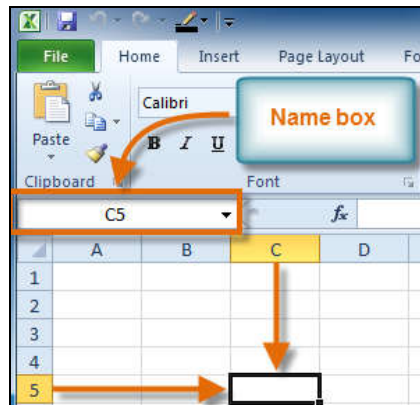



Fig. 5.4 (Cell Address)

**To Select a Cell:**

- **Click a cell** to select it. When a cell is selected, you will notice that the **borders** of the cell appear bold  and the **column heading** and **row heading** of the cell are highlighted.
- Release your mouse. The cell will stay selected until you click another cell in the worksheet.

**To Select Multiple Cells:**

- **Click and drag your mouse** until all of the adjoining cells you want are highlighted.

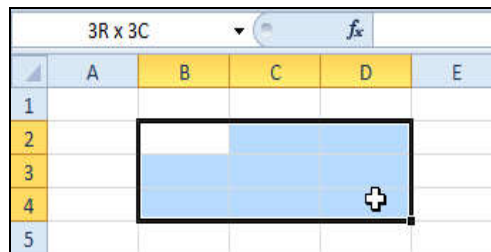


Fig. 5.5 (Selecting Multiple Cells)

- Release your mouse. The cells will stay selected until you click another cell in the worksheet.

**Note:** The *active cell* is the cell that receives the data or command you give it.

## 5.6 WORKING WITH ROWS AND COLUMNS

Microsoft Excel represents the data in tabular format consisting of rows and columns. *Row* runs horizontally while *Column* runs vertically. Each row is identified by row number



(like- 1, 2, 3, 4, 5, 6, 7..... so on) and each column is identified by column header (like- A, B, C, D, E, F ..... so on).

**Note:** In Excel 2010, row numbers ranges from **1 to 1048576**; in total **1048576** rows, and columns ranges from **A to XFD**; in total **16384** columns.

By default, every row and column of a new workbook is set to the same *height* and *width*. Excel allows you to modify column width and row height in different ways.

### 5.6.1 CHANGING COLUMN WIDTH

In Excel worksheets, if the data being entered in a cell is wider or narrower than the default column width, you can adjust the column width so it is wide enough to contain the data.

**To Modify Column Width:** You can adjust or modify the column width *manually* or use *AutoFit*.

#### (i) To Manually Adjust a Column Width:

- Place your mouse pointer to the *right side* of the **gray column header**.
- The mouse pointer changes to the **adjustment tool (double-headed arrow)**.

	A	B	C	D	E
1	Monthly Bills	January	March		
2	Rent	600	600		
3	Gas	45	55		
4	Electric	50	60		
5	Groceries	130	150		
6	Insurance	110	110		

**Fig. 5.6** (Adjust column width manually)

- Drag the Adjustment tool left or right to the desired width and release the mouse button.

#### (ii) To AutoFit the Column Width:

- Place your mouse pointer to the right side of the column header.
- The mouse pointer changes to the adjustment tool (double-headed arrow).
- **Double-click** the column header border.
- Excel "AutoFits" the column, making the entire column slightly larger than the largest entry contained in it.

**(iii) To Set Column Width with a Specific Measurement:**

- Select the columns you want to modify.
- Click on **Home** tab → **Cells** group → **Format** command. The format drop-down menu appears. Select **Column Width**.

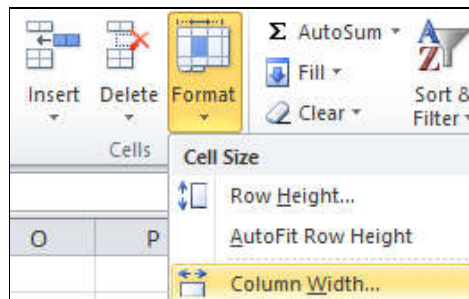


Fig. 5.7 (Column Width Option)

- The **Column Width dialog box** appears. Enter a specific measurement.

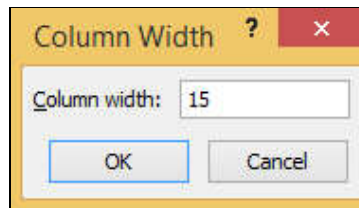


Fig. 5.8 (Column Width Dialog box)

- Click **OK**. The width of each selected column will be changed in your worksheet.

**5.6.2 CHANGING ROW HEIGHT**

Changing the row height is very much like adjusting a column width. There will be times when you want to enlarge a row to visually provide some space between it and another row above or below it.

**To Modify Row Height:** You can adjust or modify the row height manually or use AutoFit.

**(i) To Manually Adjust a Row Height:**

- Place your mouse pointer to the lower edge of the *row heading* you want to adjust.
- The mouse pointer changes to the adjustment tool (double-headed arrow).
- **Drag** the Adjustment tool up or down to the desired height and release the mouse button.

	A	B	C	D
1	Monthly Bills	January	March	
2	Rent	600	600	
3	Gas	45	55	
4	Electric	50	60	
5	Groceries			
6	Insurance			
7	Car Payment			
8	Cable			
9	Internet	50	50	

Fig. 5.9 (Adjust row height manually)

**(ii) To AutoFit the Row Height:**

- Place your mouse pointer to the lower edge of the row heading you want to adjust.
- The mouse pointer changes to the adjustment tool (double-headed arrow).
- **Double-click** to adjust the row height to "AutoFit" the font size.
- Excel "AutoFits" the row, making the entire row slightly larger than the largest entry contained in the row.

**(iii) To Set Row Height with a Specific Measurement:**

- Select the rows you want to modify.
- Click on **Home** tab → **Cells** group → **Format** command. The format drop-down menu appears. Select **Row Height**.

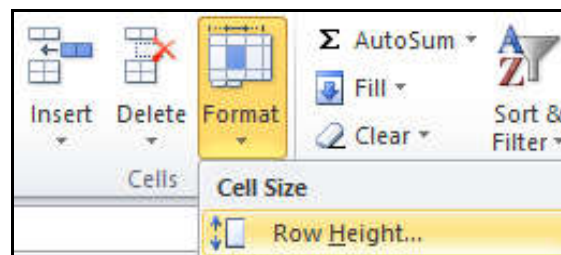


Fig. 5.10 (Row Height Option)

- The **Row Height dialog box** appears. Enter a specific measurement.

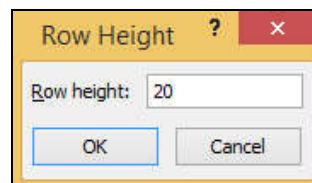


Fig. 5.11 (Row Height Dialog box)

- Click **OK**. The selected rows heights will be changed in your spreadsheet.

### 5.6.3 INSERT ROWS

To Insert Rows:

- Click anywhere in the row below where you want to insert the new row.
- Click on **Home** tab → **Cells** group → **Insert** command.

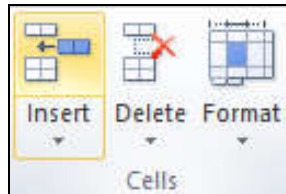


Fig. 5.12 (Insert command to insert a row)

- The new row appears in your worksheet.

### 5.6.4 INSERT COLUMNS

To Insert Columns:

- Select the column to the right of where you want the new column to appear. For example, if you want to insert a column between A and B, select column B.
- Click on **Home** tab → **Cells** group → **Insert** command.

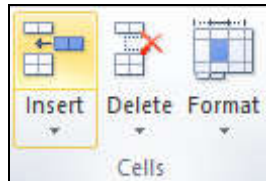


Fig. 5.13 (Insert command to insert a column)

- The new column appears in your worksheet.

### 5.6.5 INSERT CELLS

To Insert Cells:

- Select the cell or range of cells where you want to insert new cells. This could be a single cell or a group of cells.
- **Right-click** on the selected cell(s), and from the context menu that appears, choose "Insert".

OR

- Click on **Home** tab → **Cells** group → **Insert** command and select "Insert Cells".

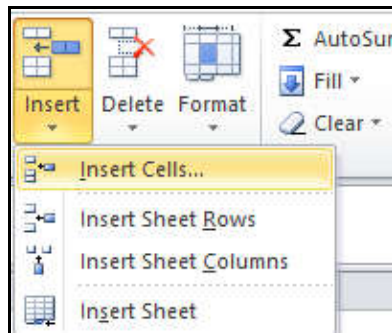


Fig. 5.14 (Insert command to insert a cells)

- In the **Insert dialog box** that appears, you can choose the type of insertion:

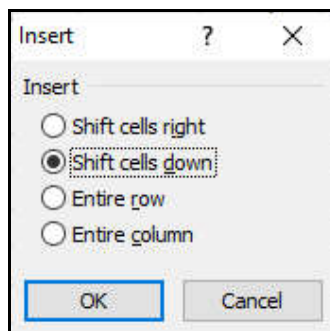


Fig. 5.15 (Insert dialog box)

- o **Shift cells right:** This option moves the existing cells to the right to make room for the inserted cells.
- o **Shift cells down:** This option moves the existing cells down to make room for the inserted cells.
- o **Entire row:** This option inserts an entire row above the selected cells.
- o **Entire column:** This option inserts an entire column to the left of the selected cells.
- After selecting the desired insertion type, click the "OK" button. The cells will be inserted, shifting the existing cells as per your selection.

### 5.6.6 DELETE ROWS

To Delete Rows:

- Select the rows you want to delete.
- Click on Home tab → Cells group → Delete command.

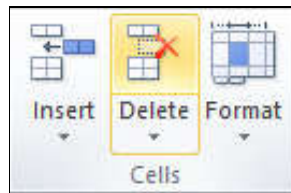


Fig. 5.16 (Delete command to delete a row)

- The rows are deleted from your worksheet.

### 5.6.7 DELETE COLUMNS

To Delete Columns:

- Select the columns you want to delete.
- Click on **Home** tab → **Cells** group → **Delete** command.

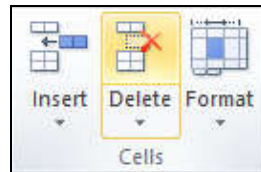


Fig. 5.17 (Delete command to delete a column)

- The columns are deleted from your worksheet.

### 5.6.8 DELETE CELLS

To Delete Cells:

- Select the cell or range of cells you want to delete. This could be a single cell or a group of cells.
- **Right-click** on the selected cell(s), and from the context menu that appears, choose "Delete".

OR

- Click on **Home** tab → **Cells** group → **Delete** command and select "Delete Cells".

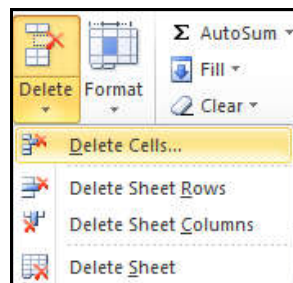


Fig. 5.18 (Delete command to delete cells)

- In the **Delete dialog box** that appears, you can choose the type of deletion:

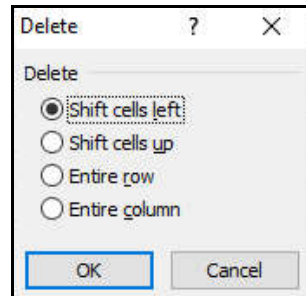


Fig. 5.19 (Delete dialog box)

- o **Shift cells left:** This option shifts the remaining cells to the left, filling the gap created by the deleted cells.
- o **Shift cells up:** This option shifts the remaining cells up, filling the gap created by the deleted cells.
- o **Entire row:** This option deletes the entire row containing the selected cells.
- o **Entire column:** This option deletes the entire column containing the selected cells.

After selecting the desired deletion type, click the "OK" button. The cells will be deleted, and the remaining cells will be shifted accordingly.

## 5.6.9 WRAPPING TEXT AND MERGING CELLS

If a cell contains more text than can be displayed, you can choose to wrap the text within the cell or merge the cell with empty adjoining cells. *Wrap text* to make it display on multiple lines of the cell. *Merge cells* to combine adjoining cells into one larger cell.

### To Wrap Text:

- Select the cells with text that you want to wrap.
- Select the **Home** tab → **Alignment** group → **Wrap Text** command.

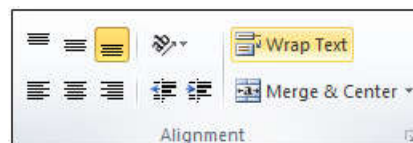


Fig. 5.20 (Wrap Text command)

- The text in the selected cells will be wrapped in your worksheet.

**To Merge Cells using the Merge & Center command:**

- Select the cells you want to merge.
- Select the **Home** tab → **Alignment** group → **Merge & Center** command.

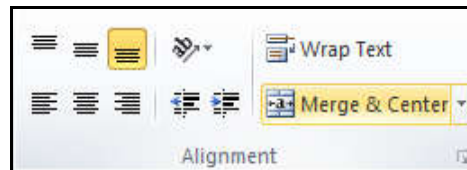


Fig. 5.21 (Merge & Center command)

- The selected cells will be merged, and the text will be centered.

## 5.7 CREATING A WORKBOOK

Excel files are called *workbooks*. Each workbook holds one or more *worksheets* (also known as spreadsheets).

**To Create a New Workbook:**

- Click the **File** tab to move on **Backstage view**.
- Select **New**.
- Select **Blank workbook** under **Available Templates**.  
(It will be highlighted by default.)
- Click **Create**. A new blank workbook appears in the Excel window.

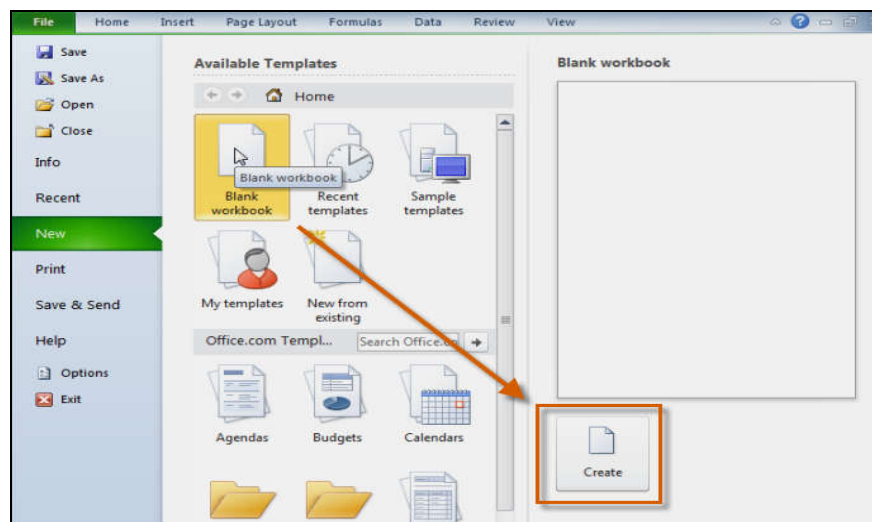


Fig. 5.22 (Creating a Workbook)



## 5.8 OPENING A WORKBOOK

There may be a situation when you open an existing workbook and edit it partially or completely.

**To Open an Existing Workbook:**

- Click the **File tab** to move on **Backstage view**.
- Select **Open**. The **Open dialog box** appears.

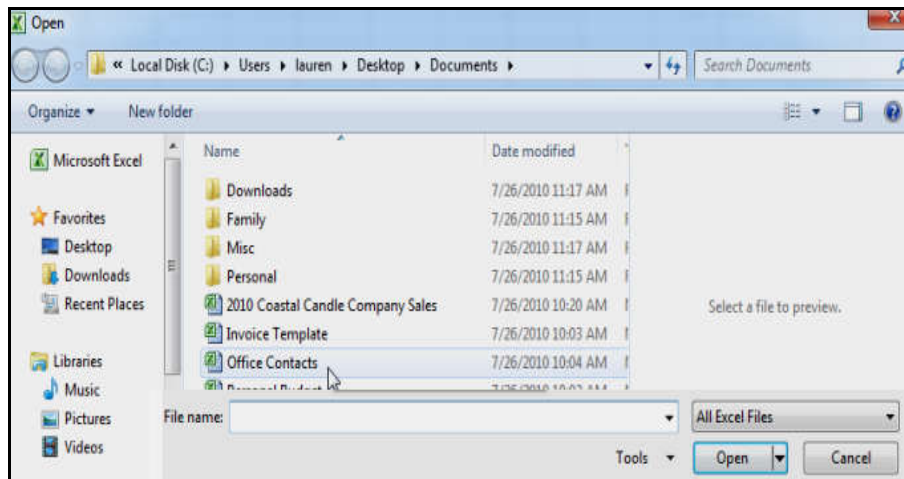


Fig. 5.23 (Opening a Workbook: Open Dialog box)

- Select your desired workbook and then click **Open**.

## 5.9 ENTERING AND EDITING DATA

In the cell(s) of worksheet(s), the data that you enter can be numbers, text, dates, or times.

**To Enter Text or Numbers:**

- Left click a **cell** to select it. Each **rectangle** in the worksheet is called a **cell**. As you select a cell, the **cell address** appears in the **Name Box**.

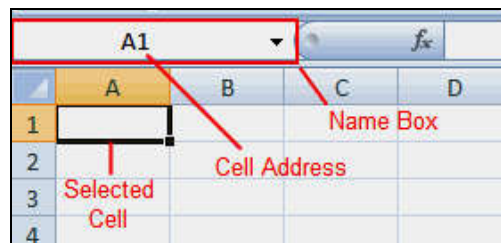


Fig. 5.24 (Selecting a Cell to Enter Data)

- Enter **text** or **numbers** into the **cell** using your keyboard. The entered data appears in the cell and in the **formula bar**.

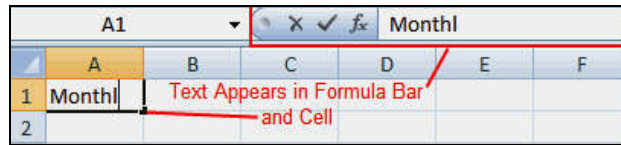


Fig. 5.25 (Enter Data into Cell)

#### To Enter Date or Time:

- On the **worksheet**, click a **cell**.
- Type a **date** or **time** as follows:
  - o To enter a date, use a *slash mark* or a *hyphen* to separate the parts of a date; for example, type 9/5/2002 or 5-Sep-2002.
  - o To enter a time that is based on the 12-hour clock, enter the time followed by a space, and then type **a** or **p** after the time; for example, 9:00 p. Otherwise, Excel enters the time as AM.
- To enter the current date and time, press **Ctrl+Shift+;** (semicolon).

#### To Edit or Delete Data:

- Select the cell.
- Press the **Backspace** key on your keyboard to delete text and make a correction.
- Press the **Delete** key to delete the entire contents of a cell.

**Note:** 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.

## 5.10 SAVING A WORKBOOK

Once you are done with typing in your new excel sheet, it is time to save your sheet/workbook to avoid losing work you have done on an Excel sheet.

#### To Save the Workbook:

- Click the **File tab** and select **Save** or **Save As** option.
  - o **Save As** allows you to name the file and choose a location to save the spreadsheet. Choose **Save As** if you would like to save the file for the first time or if you would like to save the file as a different name.
  - o Select **Save** if the file has already been named.

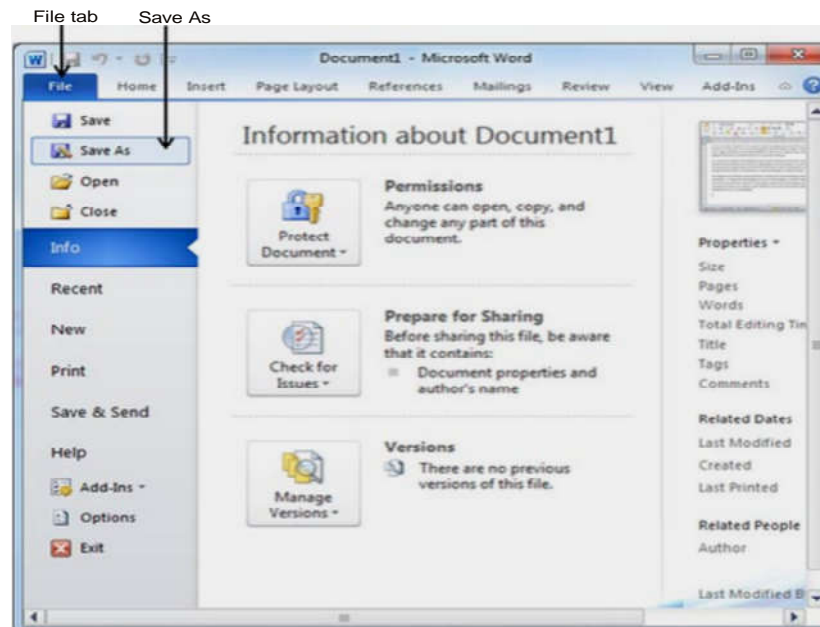


Fig. 5.26 (Save a workbook)

- Select a folder where you would like to save the sheet, Enter file name which you want to give to your sheet and Select a **Save as type**, by default it is **.xlsx** format.
- Finally, click on **Save** button and your sheet will be saved with the entered name in the selected folder.

## 5.11 CREATING A NEW WORKSHEET

By default each workbook in Excel 2010 contains 3 blank worksheets named as, *Sheet1*, *Sheet2* and *Sheet3*.

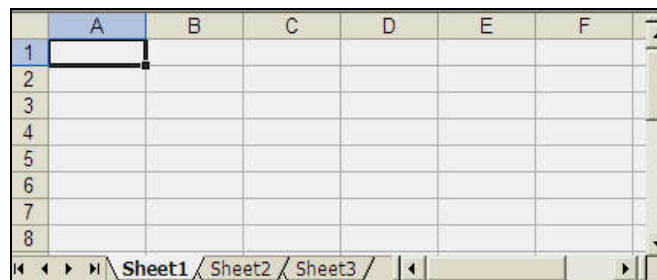


Fig. 5.27 (Default Worksheets in a Workbook)

But suppose that you want to start another new worksheet while you are working on another worksheet, or you closed already opened worksheet and want to start a new worksheet.

**To Create a New Worksheet:**

- Right Click the **Sheet Name** and select **Insert** option.

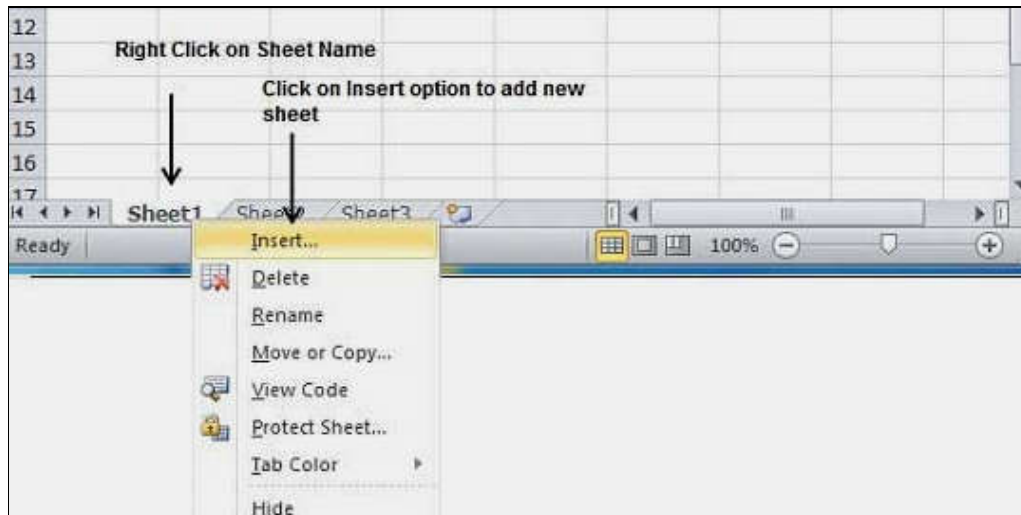


Fig. 5.28 (Create a New worksheet)

- Now you will see the **Insert dialog box** with select **Worksheet** option as selected from the **General** tab. Click **Ok** button.

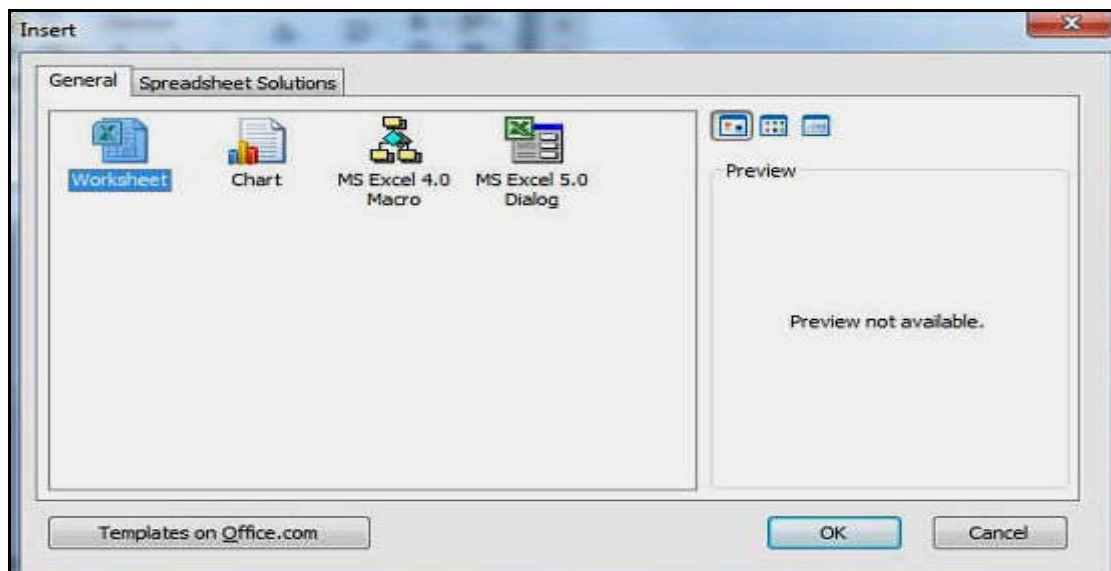


Fig. 5.29 (Create a New worksheet: Insert dialog box)

- A new blank sheet will be displayed and you can start typing your text.

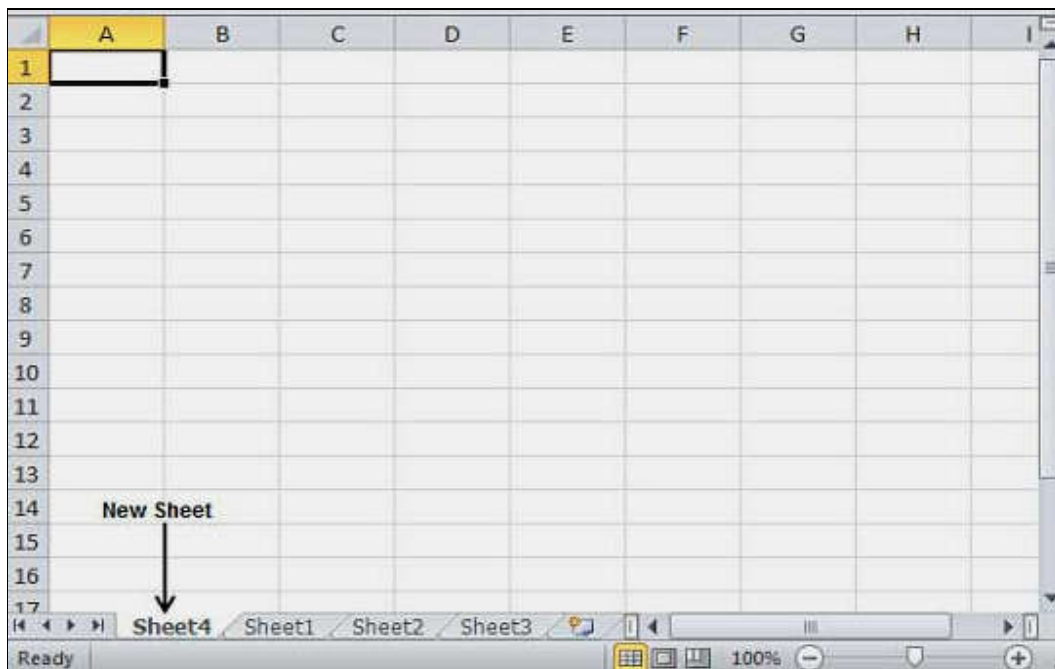


Fig. 5.30 (Create a New worksheet: A New blank sheet)

## 5.12 CLOSING A WORKBOOK

Closing a workbook simply removes the file from your screen but keeps your Excel 2010 program running so you can edit or open another file. If you have not saved your file, closing a file will prompt you to save your changes.

### To Close a Workbook:

- Click the **File** tab.
- The **Backstage View** appears.
- Click **Close**.

If you have not saved your file, a dialog box appears asking whether you want to save your changes.

- Click **Save** to save your changes, **Don't Save** to discard any changes, or **Cancel** to keep your file open.

If you click either **Save** or **Don't Save**, Excel 2010 closes your file.

OR

Click the **Close Button** as shown below:

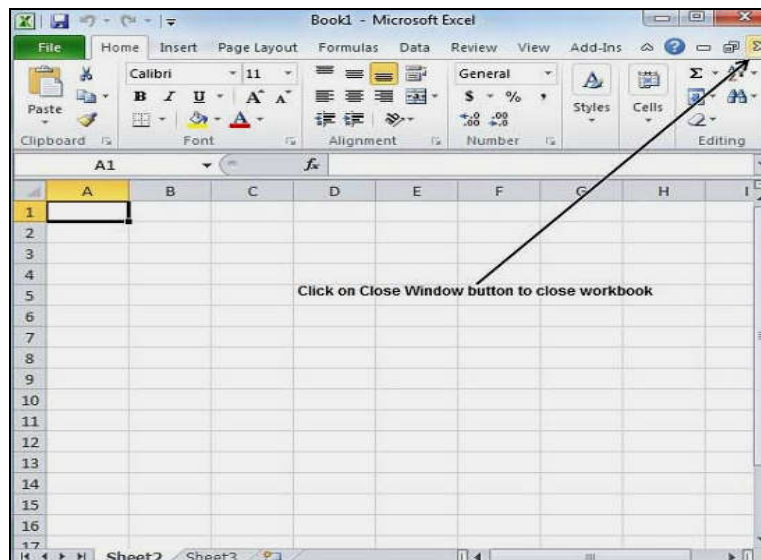


Fig. 5.31 (Closing a Workbook)

## 5.13 FORMATTING WORKSHEETS

Once you have entered information into a worksheet, you will need to be able to format it.

**To Format Text in Bold or Italics:**

- Left-click a **cell** to select it or drag your cursor over the text in the formula bar to select it.
- Click the **Bold** or **Italics** command.

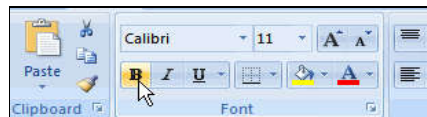


Fig. 5.32 (Formatting Text in a Worksheet: Bold or Italic)

**Note:** You can select the entire *column* and *row*, or *specific cells*.

- To select the entire column, just left-click the column heading and the entire column will appear as selected.
- To select the entire row, just left-click the row heading and the entire row will appear as selected.
- To select the specific cells, just left-click a cell and drag your mouse to select the other cells. Then, release the mouse button.

**To Format Text as Underlined:**

- Select the cell or cells you want to format.
- Click the **drop-down arrow** next to the **Underline** command.
- Select the **Single Underline** or **Double Underline** option.

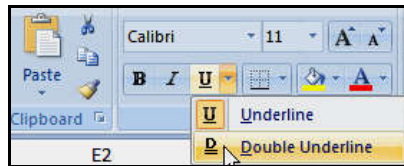


Fig. 5.33 (Formatting Text in a Worksheet: Single Underline or Double Underline)

**To Change the Font Style:**

- Select the cell or cells you want to format.
- Left-click the **drop-down arrow** next to the **Font Style** box on the **Home tab**.
- Select a **font style** from the list.

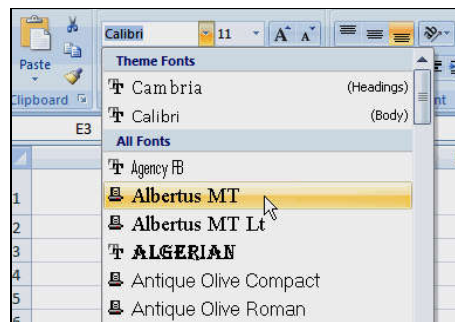


Fig. 5.34 (Formatting Text in a Worksheet: Change Font Style)

**Note:** As you move over the font list, the Live Preview feature previews the font for you in the spreadsheet.

**To Change the Font Size:**

- Select the cell or cells you want to format.
- Left-click the **drop-down arrow** next to the **Font Size** box on the **Home tab**.
- Select a **font size** from the list.

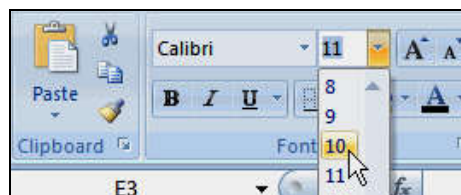


Fig. 5.35 (Formatting Text in a Worksheet: Change Font Size)

### To Change the Text Color:

- Select the cell or cells you want to format.
- Left-click the **drop-down arrow** next to the **Text Color** command. A **color palette** will appear.
- Select a color from the palette.

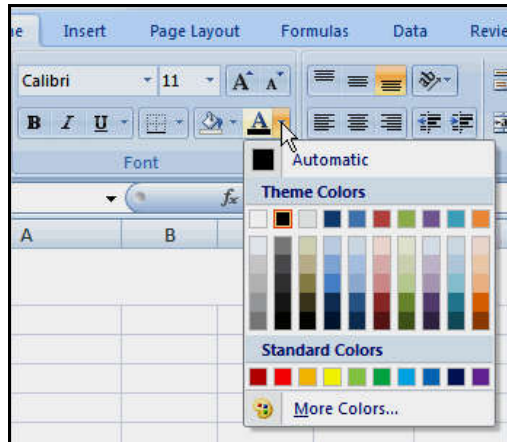


Fig. 5.36 (Formatting Text in a Worksheet: Change Text Color)

OR

- Select **More Colors**. A **dialog box** will appear.
- Select a color.
- Click **OK**.

### To Add a Border:

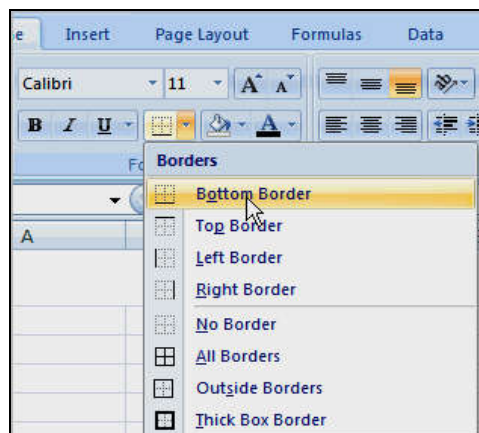


Fig. 5.37 (Formatting Text in a Worksheet: Add a Border for the cell(s))



- Select the cell or cells you want to format.
- Click the **drop-down arrow** next to the **Borders** command on the **Home tab**. A menu will appear with border options.
- Left-click an option from the list to select it.

#### To Add a Fill Color:

- Select the cell or cells you want to format.
- Click the **Fill command**. A **color palette** will appear.
- Select a color.

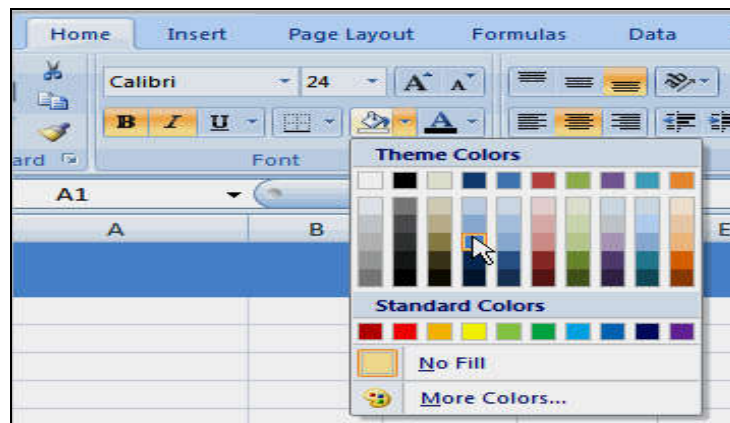


Fig. 5.38 (Formatting Text in a Worksheet: To add a Fill Color for the cell(s))

OR

- Select **More Colors**. A **dialog box** will appear.
- Select a color.
- Click **OK**.

## 5.14 MANAGING WORKSHEETS

In a workbook, the tabs displayed at the bottom of the screen are named *Sheet1*, *Sheet2* and *Sheet3*. These are not very informative names. Excel allows you to define a meaningful name for each worksheet in a workbook so that you can quickly locate information.

### 5.14.1 RENAMING A WORKSHEET

#### To Rename a Worksheet:

- Double-click the **sheet tab** to select it. The text is highlighted by a black box.



Fig. 5.39 (Renaming a worksheet)

OR

- Right click on the **sheet tab** and select **Rename** option from the shortcut menu. The text is highlighted by a black box.

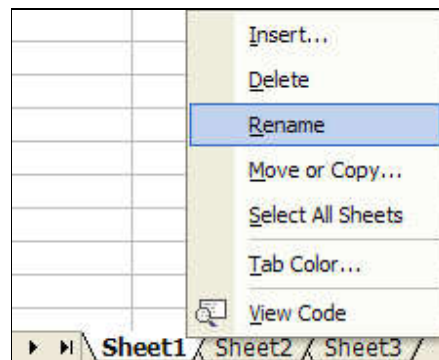


Fig. 5.40 (Renaming a worksheet through Shortcut menu)

- Type a **new name** for the worksheet.

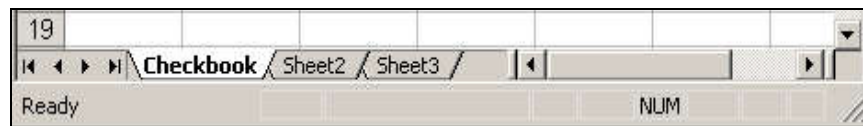


Fig. 5.41 (Setting new name for the worksheet)

- Press the **Enter** key.

### 5.14.2 INSERTING A WORKSHEET

By default, each new workbook in *Excel* defaults to three worksheets named *Sheet1*, *Sheet2* and *Sheet3*. You have the ability to insert new worksheets if needed.

**To Insert a New Worksheet:**

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



Fig. 5.42 (Insert a New worksheet: Using Insert Worksheet tab)

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

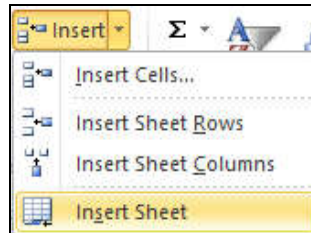


Fig. 5.43 (Insert a New worksheet: Using Insert Sheet option)

- **Right click** on the sheet tab and select **Insert** option from the shortcut menu.

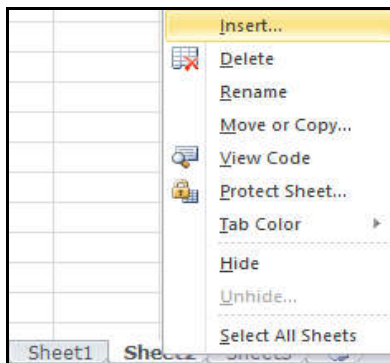


Fig. 5.44 (Insert a New worksheet: Using Shortcut menu)

**Note:** To change the order of the worksheets in a workbook, click the tab of the worksheet that you want to move, and then drag it to the location that you want.

### 5.14.3 WORKING WITH MULTIPLE WORKSHEETS

A workbook is a multi-page Excel document that contains multiple worksheets. Sometimes you need to work with the worksheets one at a time as if each is a single unit. Other times, the same information or formatting may need to be added to every worksheet. You can type and retype the same information in each worksheet and apply identical formatting, or you can group the worksheet and enter the information just once.

*Grouping worksheets* allows you to apply identical formulas and/or formatting across all worksheets in a group. When you group worksheets, any changes made to one worksheet will be changed in any other worksheets in the group.

*For example*, if several worksheets will have the same data, like- regions, departments,

quarters, months, weeks, and days, then you type it once and it will appear on every worksheet included in the grouping.

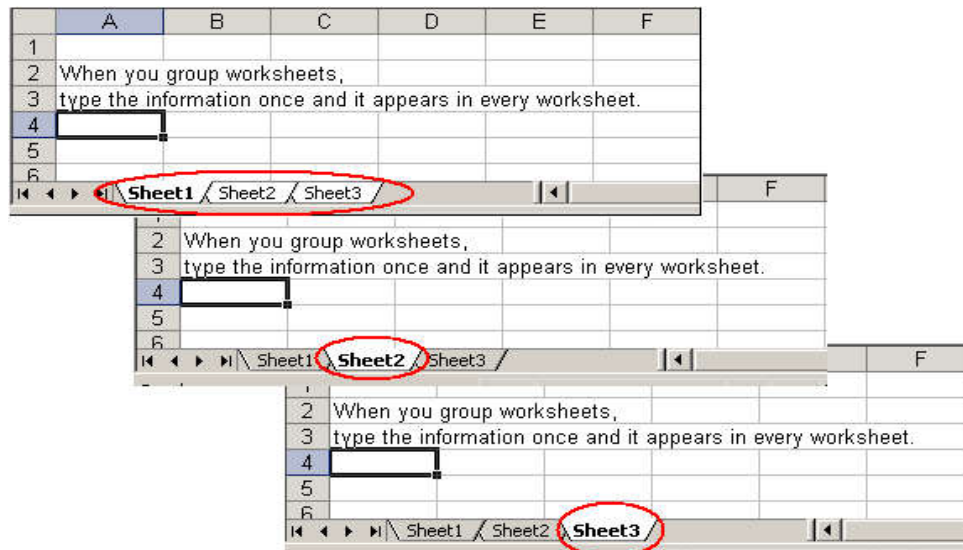


Fig. 5.45 (Multiple worksheets in a Group)

#### To Group Worksheets:

- To select one worksheet, click the **sheet tab**.
- To select more than one worksheet, hold the **Control** key down and click one or more worksheet tabs in the workbook.
- To select all worksheets in a workbook, right-click any worksheet tab and choose **Select All Sheets** from the **shortcut menu**.

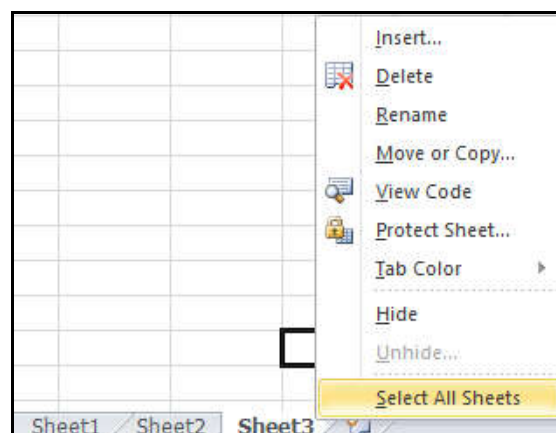


Fig. 5.46 (Grouping Worksheets)

When you are finished entering, moving, copying, or formatting data, you will need to ungroup worksheets. If you do not ungroup the sheets, any work you do in one sheet will be duplicated in all of the others.

**To Ungroup Worksheets:**

- Right-click any of the selected worksheet tabs.
- Choose **Ungroup Sheets** from the **shortcut menu**.

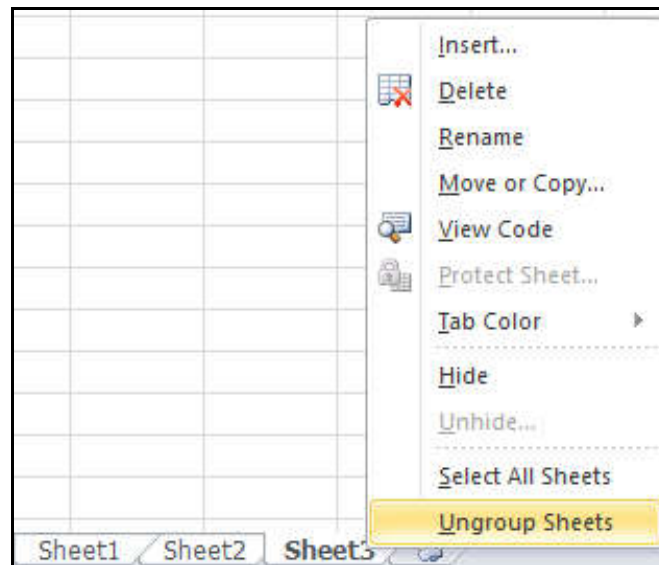


Fig. 5.47 (Ungrouping Worksheets)

#### 5.14.4 DELETING A WORKSHEET

Any worksheet can be deleted from a workbook, including those that have data in it.

**Note:** Remember, a workbook must contain at least one worksheet.

**To Delete One or More Worksheets:**

- Select the worksheet or worksheets that you want to delete.

**Note:** When multiple worksheets are selected, **[Group]** appears in the title bar at the top of the worksheet. To cancel a selection of multiple worksheets in a workbook, click any unselected worksheet. If no unselected sheet is visible, right-click the tab of a selected sheet, and then click **Ungroup Sheets** on the shortcut menu.

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

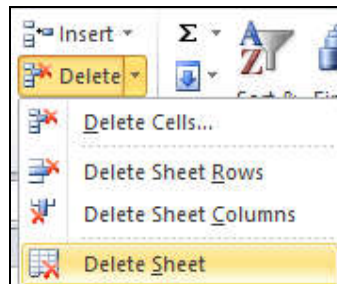


Fig. 5.48 (Deleting a worksheet: Using Delete Sheet Option)

- You can also right-click the sheet tab of a worksheet or a sheet tab of any selected worksheets that you want to delete, and then click **Delete Sheet**.

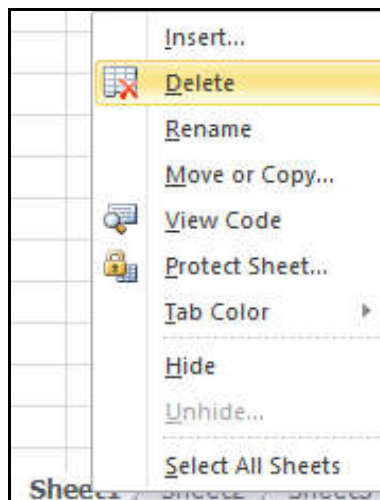


Fig. 5.49 (Deleting a worksheet: Using Shortcut menu)

### 5.14.5 MOVING OR COPYING A WORKSHEET

You can use the Move or Copy Sheet command to move or copy entire worksheets (also known as sheets), to other locations in the same or a different workbook. You can use the Cut and Copy commands to move or copy a portion of the data to other worksheets or workbooks.

#### To Move or Copy Worksheets:

- Select the worksheets that you want to move or copy. If you want to move or copy more than one, press and hold the **Ctrl** key, and then click the tabs of the sheets you want to copy.
- Select **Home** Tab → **Cells** Group → **Format** → **Move or Copy Sheet**.

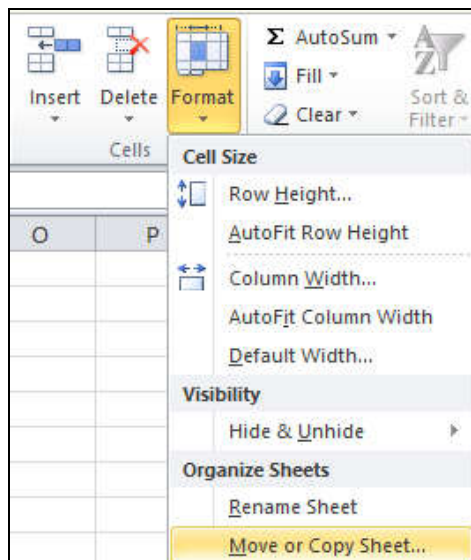


Fig. 5.50 (Moving or copying a worksheet)

OR

- You can also **right-click** a selected sheet tab, and then click **Move or Copy**.

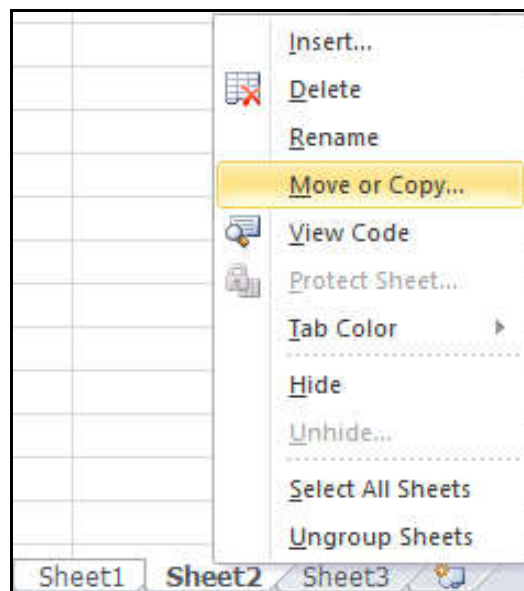


Fig. 5.51 (Moving or copying a worksheet: Using Shortcut menu)

- **Move or Copy dialog box** will be appeared. In the **Move or Copy dialog box**, click the sheet that should be after the moved or copied sheet.

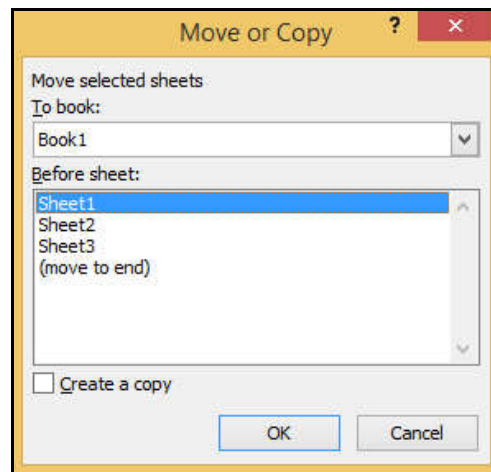


Fig. 5.52 (Move or Copy Dialog box)

- To copy the sheets instead of moving those, in the **Move or Copy dialog box**, select the **Create a copy** check box.

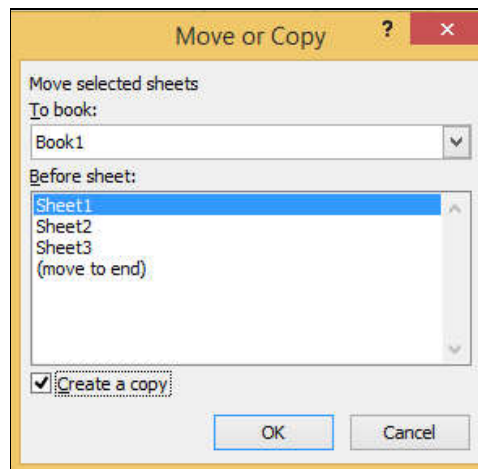


Fig. 5.53 (Move or Copy Dialog box: Create a Copy)

- When you create a copy of the worksheet, the worksheet is duplicated in the workbook, and the sheet name indicates that it is a copy. For example, the first copy that you make of **Sheet1** is named **Sheet1 (2)**.

## 5.15 FORMULA

*Formulas* are equations that perform calculations on data values in the worksheet. Like a calculator, Excel can execute formulas that add, subtract, multiply, and divide. A formula can be a combination of constant values, cell references and mathematical operators (+, -, /, \*, =).



- A formula starts with an equal sign (=) in a cell. This tells Excel that you are entering a formula, not just numbers.
- Type the equation you want to calculate. For example, to add up 10 and 20, you type =10+20.
- Press the *Enter key* to complete your calculation.
- Instead of entering numbers directly in your calculation formula, you can put them in separate cells, and then reference those cells in your formula, e.g., =A1+A2+A3.

**Example:**

The following formula multiplies 5 by 10 and then adds the value in cell A2 to the result:

$$=A2+5*10$$

Here,

- 5 and 10 are constant values.
- + and \* are mathematical operators.
- A2 is the cell reference, which returns the value in cell A2.

The formula is visible only in the *Formula bar*. A formula's result will change as different numbers are entered into the cells included in the formula's definition.

**Note:** The cell address in a formula is known as the cell reference.

	A	B	C
1	1	6	52
2	2	7	

Fig. 5.54 (Formula Visible in the Formula bar)

### 5.15.1 HANDLING OPERATORS IN FORMULA

An operator in Excel specifies the type of calculation to be performed on a given set of values. Excel has a variety of operators, including arithmetic operators, comparison operators, and reference operators.

#### (1) Arithmetic Operators

Arithmetic operators are used to perform arithmetic operations over data values, like-addition, subtraction, multiplication, division etc.

The following table shows how to handle basic arithmetic operators in Excel formula:

Operator	Description	Excel Formula
+ (Addition Operator)	It makes the addition of two or more than two numeric values and gives a numeric value as a return.	= A1 + B1

- (Subtraction Operator)	Subtracts two or more than two numeric values and gives a numeric value in return	= A1 - B1
* (Multiplication Operator)	Multiplies one numeric value with the other and gives a numeric value in return	= A1 * B1
/ (Division Operator)	Divides the numerator (should be numeric) value with the denominator (should be numeric) value and gives a numeric value in return.	= A1 / B2
% (Percentage Operator)	Converts the number present in a cell into a percentage (i.e., divides the number by 100)	= A1 %
^ (Exponential Operator)	Raises the power of the first numeric value by the second numeric value.	= A1 ^ B1

## (2) Logical / Comparison Operators

These operators logically compare the two values (numeric or text) and return a Boolean output, i.e. TRUE or FALSE.

The following table shows how to handle basic logical operators in Excel formula:

Operator	Description	Excel Formula
= (Equals To)	It compares two values and returns TRUE if both values are equal; else returns FALSE.	=A1 = B1
<> (Not Equals To)	It compares two values and returns TRUE if both values are not equal to each other else returns FALSE.	=A1 <> B1
> (Greater Than)	It returns TRUE if the value in cell A1 (First Value) is greater than the value in cell B1 (Second Value) else returns FALSE.	=A1 > B1
< (Less Than)	It returns TRUE if the value in cell A1 (First Value) is lesser than the value in cell B1 (Second Value); else returns FALSE.	=A1 < B1
>= (Greater than or equals to)	It returns TRUE if the value in cell A1 (First Value) is greater than or equals to the value in cell B1 (Second Value); else returns FALSE.	=A1 >= B1
<= (Less than or equals to)	It returns TRUE if the value in cell A1 (First Value) is less than or equals to the value in cell B1 (Second Value); else returns FALSE.	=A1 <= B1

### (3) Reference Operators

Reference operators are used to refer to the ranges from your excel spreadsheet in a formula. Following are the reference operators used in Excel:

Operator	Description	Excel Formula
: (Colon)	It is a range operator that gives a range of cells within start point and end point reference cells.	= SUM(A2:B6) The above formula provides sum of all cell values as a range starting from A2 to cell B6.
, (Comma)	It is a union operator. This operator combines (as the word union suggests) two or more than two references into a single reference.	= SUM(A2:A6, A2:B3)
(space)	It is an intersection operator. This operator only gives reference to those cells which are common in two range arguments.	= SUM(A2:A6 A2:B3)

#### 5.15.2 COPY AND PASTE FORMULA

The process to copy and paste a formula is identical to that process used to copy and paste text.

##### To Copy and Paste a Formula:

- Select the cell that contains the formula to be copied.

	C1			
	A	B	C	D
1	1	6	52	
2	2	7		
3	3	8		

Fig. 5.55 (Copy a Formula)

- To copy the formula, click on the **Home** tab → **Clipboard** group → **Copy** command.

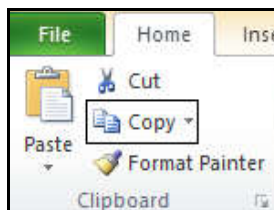


Fig. 5.56 (Copy Command)

OR

Press **Ctrl+C**.

- Now, select the cell where the copied formula is to be pasted.
- To paste the formula, click on the **Home** tab → **Clipboard** group → **Paste** command.

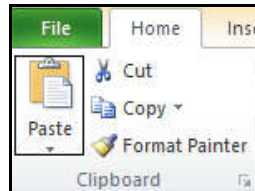


Fig. 5.57 (Paste Command)

OR

- Press **Ctrl+V**.

OR

- Press the **Enter** key. The formula is copied to the new location.

	A	B	C	D
1	1	6	52	
2	2	7	53	
3	3	8		

Fig. 5.58 (Paste a Formula)

**Note:** The cell references in a formula are automatically updated when the formula is copied to another cell in the worksheet.

### 5.15.3 REVISING FORMULA

You can revise any formula that was previously written in a worksheet.

**To Revise a Formula:**

- **Double-click** the cell that contains the formula you want to revise.
- The cursor can now move left and right between the values in the formula.

	A	B	C	D
1	1	6	=A2+5*10	
2	2	7	53	
3	3	8		

- Make the necessary changes to the formula. Like, replace cell A2 with cell A3 in the formula.

	A	B	C	D
1	1	6	=A3+5*10	
2	2	7	53	
3	3	8		

- Press the **Enter** key to accept the new formula.

	A	B	C	D
1	1	6	53	
2	2	7	53	
3	3	8		

## 5.16 CELL REFERENCING

The cell address in a formula is known as the *cell reference*. With the help of cell references, you can use the data in different parts of a worksheet.

### Types of Cell Referencing:

There are three types of cell references:

(1) **Relative Reference:** When you create a formula, references to cell(s) are usually based on the position relative to the cell. When you copy or move a formula to other cells, the reference cell automatically changes.

*Example:*

In **Figure 5.59**, the formula in A3 is = A1+A2. When you copy the formula from A3 to B3, Excel automatically changes the reference to match the location of cells i.e. it becomes B3=B1+B2.

	A	B	C
1	10	20	
2	20	30	
3	30		
4			

Fig. 5.59 (Relative Reference: Simple formula)

	A	B
1	10	20
2	20	30
3	30	50
4		
5		

Cell References changes automatically on copying and pasting the formula from A3 to B3.

Fig. 5.60 (Relative Reference: Copy and Paste the formula)

(2) **Absolute Reference:** Absolute reference is used when you do not want to change the address of the cell on copying the formula to another cell. For this purpose, you have to add the dollar symbol (\$) before the column and the row number.

*Example:*

- Enter the numbers (**Figure 5.61**) you want to calculate (e.g., 34,567.00 in cell B2 and 1,234.00 in cell B3).
- Then, create a simple formula (=B2+B3) in cell B5.

	A	B	C	D	E
1					
2	Sales	34,567.00		45,234.00	
3	Expenses	1,234.00		21,543.00	
4					
5		35,801.00			
6					
7					
8					
9					

Fig. 5.61 (Absolute Reference: Simple formula)

- To create an absolute reference in the formula just created, insert a **\$ symbol** before the B (column reference) and 2 (row reference) in the reference to B2 so the new formula reads, (=\$B\$2+B3). (**Fig. 5.62**)

	A	B	C	D	E
1					
2	Sales	34,567.00		45,234.00	
3	Expenses	1,234.00		21,543.00	
4					
5		= \$B\$2 + B3			
6					
7					
8					
9					
10					

Insert a \$ value before the B and 2 to create an absolute column reference (\$B) and absolute row reference (\$2)

Fig. 5.62 (Absolute Reference: Create an absolute reference)

- **Copy and Paste** the formula to another adjacent cell (**D5**). The formula now includes an absolute reference to B2, (=\$B\$2+D3).

D5		fx = \$B\$2+D3			
	A	B	C	D	E
1					
2	Sales	34,567.00		45,234.00	
3	Expenses	1,234.00		21,543.00	
4					
5		35,801.00		56,110.00	
6					
7					
8					
9					
10					
11					
12					

The pasted cell retains the absolute reference to cell \$B\$2 while the second reference has changed from B3 to D3.

Fig. 5.63 (Absolute Reference: Observe the Cell Reference once the formula is applied)

(3) **Mixed Reference:** It is a combination of *Relative* and *Absolute* reference. In this type of reference, either row or column has to remain fixed.

*Example:*

- Enter the numbers you want to calculate.  
(e.g., 10 in cell A1 and 20 in cell A2). (Fig. 5.64)
- Then, create a simple formula (=A1+A2) in cell A3.

A3		fx = A1+A2	
	A	B	C
1	10	20	
2	20	30	
3	30		
4			

Fig. 5.64 (Mixed Reference: Simple formula)

- To create a mixed reference in the formula just created, insert a **\$ symbol** before the A (column reference) for A1 and a **\$ symbol** before the 2 (row reference) for A2 in the formula bar. The new formula reads, (=A1+A2). (Fig. 5.65)

SUM		fx = \$A1+\$2	
	A	B	C
1	10	20	
2	20	30	
3	=A1+A2	50	

Fig. 5.65 (Mixed Reference: Create a mixed reference)

- **Copy and Paste** the formula to another adjacent cell (B3). The formula now includes a mixed reference for the cell B3 (=A1+B\$2).

	A	B	C	D
1	10	20		
2	20	30		
3	30	40		
4				
5				

Fig. 5.66 (Mixed Reference: Observe the Cell Reference Once the formula is applied)

## 5.17 FUNCTIONS

*Functions* are predefined formulas that perform calculations by using specific values, called *arguments*, in a particular order. Functions can be used to perform simple or complex calculations. Functions save you the time of writing lengthy formulas.

For example, you can use an Excel function called *Average*, to quickly find the average of range of numbers.

Each function has a specific order, called *syntax*, which must be strictly followed for the function to work correctly.

### *Syntax Order:*

1. All functions begin with the = sign.
2. After the = sign, define the *function name* (e.g., SUM).
3. After the function name, define *argument(s)* enclosed by parentheses (numbers, text or cell references). If there is more than one argument, separate each by a comma.

An example of a function with one argument that adds a range of cells, B3 through B10:

=SUM(B3:B10)
--------------

Diagram illustrating the components of the function =SUM(B3:B10):

- equal sign (points to =)
- function name (points to SUM)
- argument (points to B3:B10)

Fig. 5.67 (Function with One Argument)

An example of a function with more than one argument that calculates the average of numbers in a range of cells, B3 through B10, and C3 through C10:

=AVG(B3:B10, C3:C10)
----------------------

Diagram illustrating the components of the function =AVG(B3:B10, C3:C10):

- equal sign (points to =)
- function name (points to AVG)
- argument (points to B3:B10, C3:C10)

Fig. 5.68 (Function with more than One Argument)



Excel provides hundreds of functions to assist you in different sort of calculation. Some of the commonly used functions are discussed below:

### 5.17.1 MATHEMATICAL FUNCTIONS

Excel's Mathematical functions can be used to perform common mathematical operations such as addition, multiplication and rounding numbers. Some of the commonly used mathematical functions are discussed below:

#### (1) SUM

The SUM function returns the sum of values supplied. These values can be numbers, cell references, ranges, and constants, in any combination.

##### *Example:*

In the following spreadsheet, the SUM function is used to calculate the sum of the numbers 5, 6, 7, 8 & 9. In each of the five methods, the numbers are supplied to the SUM function in a different way.

Formulas:			Results:		
	A	B		A	B
1	5	=SUM( 5, 6, 7, 8, 9 )	1	5	35
2	6	=SUM( {5,6,7}, 8, 9 )	2	6	35
3	7	=SUM( A1, A2, A3, A4, A5 )	3	7	35
4	8	=SUM( A1, A2, A3, "8", "9" )	4	8	35
5	9	=SUM( A1:A5 )	5	9	35

#### (2) SUMIF

The SUMIF function returns the sum of cells that meet a single condition. Criteria can be applied to dates, numbers, and text.

##### *Example:*

The following spreadsheet shows three examples of the SUMIF function used with text-based criteria:

Formulas:				Results:			
	A	B	C		A	B	C
1	Month	Team	Sales	1	Month	Team	Sales
2	Jan	North 1	\$36,693	2	Jan	North 1	\$36,693
3	Jan	North 2	\$22,100	3	Jan	North 2	\$22,100
4	Jan	South 1	\$53,321	4	Jan	South 1	\$53,321
5	Jan	South 2	\$34,440	5	Jan	South 2	\$34,440
6	Feb	North 1	\$29,889	6	Feb	North 1	\$29,889
7	Feb	North 2	\$50,090	7	Feb	North 2	\$50,090
8	Feb	South 1	\$32,080	8	Feb	South 1	\$32,080
9	Feb	South 2	\$45,500	9	Feb	South 2	\$45,500
10				10			
11	=SUMIF( A2:A9, "Feb", C2:C9 )			11	\$157,559	- sum of cells C6-C9	
12	=SUMIF( B2:B9, "North 1", C2:C9 )			12	\$66,582	- sum of cells C2 & C6	
13	=SUMIF( B2:B9, "North*", C2:C9 )			13	\$138,772	- sum of cells C2, C3, C6 & C7	

### (3) PRODUCT

The PRODUCT function returns the product of a supplied set of numerical values.

*Example:*

In the following spreadsheet, the PRODUCT function is used to calculate the product of the numbers 3, 6, 2, 8 & 5. In each of the five methods, the numbers are supplied to the PRODUCT function in a different way.

Formulas:			Results:		
	A	B		A	B
1	3	=PRODUCT( 3, 6, 2, 8, 5 )	1	3	1440
2	6	=PRODUCT( {3,6,2}, 8, 5 )	2	6	1440
3	2	=PRODUCT( A1, A2, A3, A4, A5 )	3	2	1440
4	8	=PRODUCT( A1, A2, A3, "8", "5" )	4	8	1440
5	5	=PRODUCT( A1:A5 )	5	5	1440

### (4) SUMPRODUCT

The SUMPRODUCT function returns the sum of the products of the corresponding values in a set of supplied arrays.

**Example:**

The following spreadsheet shows the use of SUMPRODUCT function:

Formulas:			
	A	B	C
1	Array 1	Array 2	Sumproduct
2	1	5	=SUMPRODUCT( A2:A4, B2:B4 )
3	2	6	=SUMPRODUCT( A2:A4, B2:B4, {2; 4; 1} )
4	3	4	=SUMPRODUCT( A2:A4, B2:B4, {2; 4; "text"} )

Results:				
	A	B	C	D
1	Array 1	Array 2	Sumproduct	
2	1	5	29	= 1x5 + 2x6 + 3x4
3	2	6	70	= 1x5x2 + 2x6x4 + 3x4x1
4	3	4	58	= 1x5x2 + 2x6x4 + 3x4x0
5				(note "text" is treated as 0)

**(5) POWER**

The POWER function calculates a given number, raised to a supplied power.

**Example:**

The following spreadsheet shows the use of POWER function:

Formulas:				Results:			
	A	B	C		A	B	C
1			=POWER( 2, 3 )	1			8
2	5.5	3	=POWER( A2, B2 )	2	5.5	3	166.375

**(6) SQRT**

The SQRT function calculates the positive square root of a supplied number. If the supplied number is negative, the SQRT function returns the #NUM! Error.

**Example:**

The following spreadsheet shows the use of SQRT function:

Formulas:			Results:		
	A	B		A	B
1		=SQRT( 25 )	1		5
2	15625	=SQRT( A2 )	2	15625	125
3	6.5536	=SQRT( A3 )	3	6.5536	2.56

**(7) SUBTOTAL**

The SUBTOTAL function performs a specified calculation (Eg. the sum, product, average, etc.) for a supplied set of values.

*Syntax of the function is:*

**SUBTOTAL( function\_num, ref1, [ref2], ... )**

Here,

**function\_num** - An integer that denotes the calculation type (e.g. sum, average, etc.).

**ref1, [ref2], ...** - One or more references to cells containing the values that the calculation is to be performed on. Blank cells and cells containing non-numeric values are ignored in the calculation.

The following table (**Table 5.1**) shows the possible values for **function\_num**:

**Table 5.1**

function_num (include hidden values)	function_num (ignore hidden values)	Function
1	101	AVERAGE
2	102	COUNT
3	103	COUNTA
4	104	MAX
5	105	MIN
6	106	PRODUCT
7	107	STDEV
8	108	STDEVP
9	109	SUM
10	110	VAR
11	111	VARP

*Example:*

The following spreadsheet shows the use of SUBTOTAL function:

Formulas:					Results:				
	A	B	C	D	E		A	B	C
1	Month	Team	Sales			1	Month	Team	Sales
2	Jan	Team 1	\$45,000			2	Jan	Team 1	\$45,000
3	Jan	Team 2	\$36,000			3	Jan	Team 2	\$36,000
4	Jan	Team 3	\$55,000			4	Jan	Team 3	\$55,000
5	Feb	Team 1	\$39,000			5	Feb	Team 1	\$39,000
6	Feb	Team 2	\$47,000			6	Feb	Team 2	\$47,000
7	Feb	Team 3	\$61,000			7	Feb	Team 3	\$61,000
8	Mar	Team 1	\$42,000			8	Mar	Team 1	\$42,000
9	Mar	Team 2	\$52,000			9	Mar	Team 2	\$52,000
10	Mar	Team 3	\$38,000			10	Mar	Team 3	\$38,000
11						11			
12	Total Sales:		=SUBTOTAL( 9, C2:C10 )			12	Total Sales:		\$415,000
13	Average Sales:		=SUBTOTAL( 1, C2:C10 )			13	Average Sales:		\$46,111

In the example above, as all cells are visible, we could have set the *function\_num* argument to be either **9** or **109** for the **SUM**, and to be either **1** or **101** for the **AVERAGE** calculation (*Refer Table 5.1*). Both options would give the same results.

### (8) MOD

The MOD function returns the remainder of a division between two supplied numbers.

*Example:*

The following spreadsheet shows the use of MOD function:

Formulas:				Results:			
	A	B	C		A	B	C
1			=MOD( 6, 4 )	1			2
2			=MOD( 6, 3 )	2			0
3	6	2.5	=MOD( A3, B3 )	3	6	2.5	1

### (9) ROUND

The ROUND function rounds a supplied number up or down, to a specified number of decimal places.

*Example:*

The following spreadsheet shows the use of ROUND function:

Formulas:			Results:		
	A	B		A	B
1	100.319	=ROUND( A1, 1 )	1	100.319	100.3
2	5.28	=ROUND( A2, 1 )	2	5.28	5.3
3	5.9999	=ROUND( A3, 3 )	3	5.9999	6
4	99.5	=ROUND( A4, 0 )	4	99.5	100
5	-6.3	=ROUND( A5, 0 )	5	-6.3	-6

### (10) LOG10

The LOG10 function calculates the base-10 logarithm of a number. The base-10 logarithm of a number is the power to which 10 must be raised to obtain that number. For example, the base-10 logarithm of 100 is 2, because 10 raised to the power of 2 is 100.

*Example:*

The following spreadsheet shows the use of LOG10 function:

B2				
	A	B	C	D
1	100	2		
2	1000	3		
3				

**(11) ABS**

The ABS function returns the absolute value of a number. In other words, it is the positive version of the number, regardless of whether the number is positive or negative.

*Example:*

The following spreadsheet shows the use of ABS function:

B2		=ABS(A2)	
	A	B	C
1	Number	Absolute Value	
2	-65	65	
3	-90	90	
4	55	55	
5	0	0	
6	-100	100	

**(12) LN**

The LN function calculates the natural logarithm of a number. The natural logarithm uses the mathematical constant  $e$  (approximately 2.71828) as the base. In simpler terms, it tells you to which power  $e$  must be raised to get a certain number.

*Example:*

The following spreadsheet shows the use of LN function:

B2		=LN(A2)	
	A	B	C
1	Number	Natural Logarithm	
2	1	0	
3	10	2.302585093	
4	20	2.995732274	

**5.17.2 STATISTICAL FUNCTIONS**

Excel provides a wide range of statistical functions that perform calculations, from computing basic mean (average) to the more complex analytical tests. Some of the commonly used statistical functions are discussed below:

**(1) AVERAGE**

The AVERAGE function is used to calculate the average or the arithmetic mean of a list of supplied numbers.

**Example:**

In the following spreadsheet, the AVERAGE function is used to calculate the arithmetic mean of the numbers 8, 7, 9, 6 & 10. In each case, the values are supplied to the function in different ways.

Formulas:			Results:		
	A	B		A	B
1	8	=AVERAGE( 8, 7, 9, 6, 10 )	1	8	8
2	7	=AVERAGE( {8,7,9}, 6, 10 )	2	7	8
3	9	=AVERAGE( A1, A2, A3, A4, A5 )	3	9	8
4	6	=AVERAGE( A1:A5 )	4	6	8
5	10		4	10	

**(2) MIN**

The MIN function returns the smallest value from a supplied set of numeric values.

**Example:**

The following spreadsheet shows the use of MIN function:

Formulas:			Results:		
	A	B		A	B
1	4	=MIN( A1:A5 )	1	4	1
2	3		2	3	
3	1		3	1	
4	5		4	5	
5	2		5	2	

**(3) MAX**

The MAX function returns the largest value from a supplied set of numeric values.

**Example:**

The following spreadsheet shows the use of MAX function:

Formulas:			Results:		
	A	B		A	B
1	4	=MAX( A1:A5 )	1	4	5
2	3		2	3	
3	1		3	1	
4	5		4	5	
5	2		5	2	

**(4) COUNT**

The COUNT function returns the count of numeric values in a supplied set of cells or values. This count includes both *numbers* and *dates*.

**Example:**

The following spreadsheet shows the use of COUNT function:

Formulas:				Results:			
	A	B	C		A	B	C
1	5	0	=COUNT( A1:A5 )	1	5	0	2
2	text		=COUNT( A1:A5, B1 )	2	text		3
3	FALSE		=COUNT( A1:B5 )	3	FALSE		4
4	01/01/2015			4	01/01/2015		
5	#N/A	10		5	#N/A	10	

**(5) COUNTIF**

The COUNTIF function returns the number of cells within a supplied range, that satisfy a given criteria or condition.

**Example:**

	A	B	C	D
1	Sunday	07-Sep-2008	0	TRUE
2	Monday	08-Sep-2008	2.1	TRUE
3	Wednesday	10-Sep-2008	2	TRUE
4	Thursday	11-Sep-2008	3	FALSE
5	Wednesday	17-Sep-2008	2.5	FALSE
6	Tuesday	23-Sep-2008	3	FALSE
7	Wednesday	24-Sep-2008	6	FALSE
8	Sunday	05-Oct-2008	4	FALSE
9	Saturday	11-Oct-2008	0	FALSE

Based on the above spreadsheet, the following COUNTIF functions will return the different results:

Formulas:		Results:	
	A		A
11	=COUNTIF( A1:A9, "Wednesday" )	11	3
12	=COUNTIF( A1:A9, "<>Wednesday" )	12	6
13	=COUNTIF( B1:B9, ">01/10/2008" )	13	2
14	=COUNTIF( C1:C9, 0 )	14	2
15	=COUNTIF( C1:C9, ">=3" )	15	4
16	=COUNTIF( D1:D9, TRUE )	16	3



**(6) MEDIAN**

The MEDIAN function in Excel is a statistical function that calculates the middle value of a set of numbers. When the data set has an odd number of values, the median is the middle value. When the data set has an even number of values, the median is the average of the two middle values.

*Example:*

	A	B	C	D	E
1	Month	Sales			
2	January	1000			
3	February	1100			
4	March	1300			
5	April	1500			
6	May	1600			
7	June	1800			
8	July	1850			
9	August	1900			
10	September	2000			
11	Median	1600			

**(7) MODE**

The MODE function in Excel is a statistical function that calculates the most frequently occurring value in a data set. It returns the value or values that appear the most often within a range of cells. The MODE function is useful for identifying patterns and trends in data.

*Example:*

	A	B	C	D
1	Month	Sales		
2	January	1000		
3	February	1100		
4	March	1000		
5	April	1500		
6	May	1600		
7	June	1000		
8	July	1800		
9	August	1900		
10	September	1100		
11	Mode	1000		

**(8) STDEV**

The STDEV function in Excel calculates the standard deviation of a sample of data. The standard deviation is a measure of how spread out the data is from the average value. A low standard deviation indicates that the data is clustered closely around the mean, while a high standard deviation indicates that the data is spread out over a wider range of values.

*Example:*

B11		=STDEV(B2:B10)			
	A	B	C	D	
1	Month	Sales			
2	January	1000			
3	February	1100			
4	March	1000			
5	April	1500			
6	May	1600			
7	June	1000			
8	July	1800			
9	August	1900			
10	September	1100			
11	Standard Deviation	367.4235			

**(9) VAR**

The VAR function in Excel calculates the variance of a sample of data. Variance is a statistical measure that indicates how much a set of numbers varies from its mean (average). A higher variance indicates that the numbers are more spread out, while a lower variance indicates that the numbers are more tightly clustered around the mean.

*Example:*

Suppose you have a set of exam scores: 80, 75, 90, 85, and 95. To calculate the variance of these scores, you would use the following formula:

$$=VAR(80, 75, 90, 85, 95)$$

This formula would return a value of **62.5**, which is the variance of the exam scores.

**(10) SKEW**

The SKEW function calculates the skewness of a dataset, indicating whether the data is skewed to the left (negative skewness), to the right (positive skewness), or is symmetrical (zero skewness).

*Example:*

Let's consider a simple dataset: 5, 8, 8, 10, 12. To calculate the skewness of the dataset, you would use the following formula:

$$=\text{SKEW}(5, 8, 8, 10, 12)$$

This formula would return a value of **-0.1184**, indicating negative skewness.

**(11) KURT**

The KURT function calculates the kurtosis of a dataset, which is a measure of the sharpness of a distribution's peak. It helps you understand whether the data is more or less peaked than a normal distribution.

*Example:*

Suppose you have a dataset of exam scores: 75, 80, 85, 90, and 95. To calculate the kurtosis of these scores, you would use the KURT function in Excel like this:

$$=\text{KURT}(75, 80, 85, 90, 95)$$

This formula would return a value of **-1.2**.

**(12) CORREL**

The CORREL function measures how much two sets of numbers are related to each other. It gives you a number between **-1** and **1**, where:

- **1: Perfect positive correlation** (as one set of numbers increases, the other set also increases).
- **0: No correlation** (there's no apparent relationship between the sets of numbers).
- **-1: Perfect negative correlation** (as one set of numbers increases, the other set decreases).

*Example:*

	A	B	C
1	English	Math	
2	80	70	
3	75	85	
4	90	60	
5	85	90	
6	95	75	
7	The correlation between these two sets of scores:	-0.397359707	

### 5.17.3 LOGICAL FUNCTIONS

In Excel, Logical functions are used frequently for testing conditions and making decisions. Some of the commonly used logical functions are discussed below:

#### (1) IF

The IF function checks whether a condition is met or not. It returns *one value* if the condition is TRUE and *another value* if the condition is FALSE.

*Example:*

In the following spreadsheet, select cell **C1**, enter the function =IF(A1>=33,"PASS","FAIL") and Press *Enter*.

	A	B	C	D	E
1	33	20	PASS		
2					

Here, the IF function returns PASS in cell C1 because the value in cell A1 is equals to 33.

#### (2) AND

The AND function returns TRUE if all conditions are true and returns FALSE if any of the conditions are false.

*Example:*

In the following spreadsheet, select cell **C1**, enter the function =IF(AND(A1>=60,B1<100),"FIRST","SECOND") and Press *Enter*.

	A	B	C	D	E	F	G
1	50	70	SECOND				
2							

Here, the AND function returns FALSE because the value in cell A1 is not greater than or equals to 60, though the value in cell B1 is less than 100. So in this function, the second condition is true, but the first condition is false. As a result, this function returns FALSE and put SECOND in cell C1.

#### (3) OR

The OR function returns TRUE if any of the conditions are TRUE and returns FALSE if all conditions are false.

*Example:*

In the following spreadsheet, select cell **C1**, enter the function =IF(OR(A1>=60,B1<100),"FIRST","SECOND") and Press *Enter*.

	C1	=IF(OR(A1>=60,B1<100),"FIRST","SECOND")					
	A	B	C	D	E	F	G
1	50	70	FIRST				
2							

Here, the OR function returns TRUE because the value in cell B1 is less than 100, though the value in cell A1 is not greater than or equals to 60. So in this function, out of two conditions, one is true. As a result, this function returns TRUE and put FIRST in cell C1.

#### (4) NOT

The NOT function returns the opposite to a supplied logical value. That is, if the supplied value is TRUE, the NOT function returns FALSE and if the supplied value is FALSE, the NOT function returns TRUE.

##### Example:

The following spreadsheet shows the use of NOT function:

Formulas:			Results:		
	A	B		A	B
1	=NOT( TRUE )		1	FALSE	
2	=NOT( B1=1 )		2	TRUE	

### 5.17.4 DATE AND TIME FUNCTIONS

Excel provides a number of functions to work with dates and times. Some of the commonly used date and time functions are discussed below:

#### (1) DATE

The DATE function converts a supplied year, month and day into an Excel date.

##### Example:

Formulas:					Results:				
	A	B	C	D		A	B	C	D
1	Day	Month	Year	Date	1	Day	Month	Year	Date
2				=DATE( 2001, 1, 2 )	2				02-Jan-2001
3	31	5	1998	=DATE( C3, B3, A3 )	3	31	5	1998	31-May-1998
4	21	5	1984	=DATE( C4, B4, A4 )	4	21	5	1984	21-May-1984
5	9	1	2012	=DATE( C5, B5, A5 )	5	9	1	2012	09-Jan-2012

**(2) TIME**

The TIME function accepts three integer arguments representing hours, minutes and seconds, and returns an Excel time i.e. it returns the decimal value that represents the time in Excel.

*Example:*

Formulas:					Results:						
	A	B	C	D	E		A	B	C	D	E
1	Hrs	Mins	Secs		Time	1	Hrs	Mins	Secs		Time
2					=TIME( 5, 44, 32 )	2					05:44:32
3	5	21	55		=TIME( A4, B4, C4 )	3	5	21	55		05:21:55
4	0	0	73		=TIME( A5, B5, C5 )	4	0	0	73		00:01:13

**(3) NOW**

The NOW function returns the current date and time. This function receives no arguments. The NOW function updates every time your Excel worksheet is refreshed, and so any cell(s) containing this function will be continually changing.

*Example:*

Formula:		Result:	
	A		A
1	=NOW()	1	08/08/2015 08:40

**(4) TODAY**

The TODAY function returns the current date. The function has no arguments.

*Example:*

Formula:		Result:	
	A		A
1	=TODAY()	1	01-Sep-2015

**(5) DAY**

The DAY function returns an integer representing the day of the month (from 1 - 31) of a supplied date.

*Example:*

Formulas:			Results:		
	A	B		A	B
1	31-May-2015	=DAY( A1 )	1	31-May-2015	31
2	21-Mar-1984	=DAY( A2 )	2	21-Mar-1984	21
3		=DAY( DATE(2016, 1, 1) )	3		1

**(6) MONTH**

The MONTH function returns an integer, representing the month (from 1 - 12) of a supplied date.

*Example:*

Formulas:			Results:		
	A	B		A	B
1	29-May-2016	=MONTH( A1 )	1	29-May-2016	5
2	05-Mar-1984	=MONTH( A2 )	2	05-Mar-1984	3
3		=MONTH( DATE(2015, 7, 1) )	3		7

**(7) YEAR**

The YEAR function returns an integer representing the year of a supplied date.

*Example:*

Formulas:			Results:		
	A	B		A	B
1	Date	Year	1	Date	Year
2	29-May-2015	=YEAR( A2 )	2	29-May-2015	2015
3	05/03/1984	=YEAR( A3 )	3	05/03/1984	1984
4		=YEAR( DATE(2016, 1, 1) )	4		2016

**(8) HOUR**

The HOUR function returns an integer representing the hour component of a supplied time.

*Example:*

Formulas:			Results:		
	A	B		A	B
1		=HOUR("13:00:55")	1		13
2		=HOUR("1:00 PM")	2		13
3	13:00:55	=HOUR( A3 )	3	13:00:55	13
4	08:32:55	=HOUR( A4 )	4	08:32:55	8
5	29:11:22	=HOUR( A5 )	5	29:11:22	5
6	12/09/2015 08:55	=HOUR( A6 )	6	12/09/2015 08:55	8

**(9) MINUTE**

The MINUTE function returns an integer representing the minute component of a supplied time.

*Example:*

Formulas:			Results:		
	A	B		A	B
1		=MINUTE("13:35:55")	1		35
2	13:35:55	=MINUTE( A2 )	2	13:35:55	35
3	08:17:55	=MINUTE( A3 )	3	08:17:55	17
4	12/09/2015 08:55	=MINUTE( A4 )	4	12/09/2015 08:55	55

**(10) SECOND**

The SECOND function returns an integer representing the second component of a supplied time.

*Example:*

Formulas:			Results:		
	A	B		A	B
1		=SECOND( "13:35:55" )	1		55
2	13:35:55	=SECOND( A2 )	2	13:35:55	55
3	08:17:00	=SECOND( A3 )	3	08:17:00	0
4	12/09/2011 08:17:23	=SECOND( A4 )	4	12/09/2011 08:17:23	23

**5.17.5 TEXT FUNCTIONS**

Excel has many functions to offer when it comes to manipulating text or strings. Some of the commonly used text functions are discussed below:

**(1) LEFT**

The LEFT function is used to extract the leftmost characters from a string. It returns a specified number of characters from the start of a supplied text string.

*Example:*

The following spreadsheet shows the use of LEFT function:



Formulas:			Results:		
	A	B		A	B
1	Original Text	=LEFT( A1 )	1	Original Text	O
2	Original Text	=LEFT( A2, 4 )	2	Original Text	Orig

**(2) RIGHT**

The RIGHT function is used to extract the rightmost characters from a string. It returns a specified number of characters from the end of a supplied text string.

*Example:*

The following spreadsheet shows the use of RIGHT function:

Formulas:			Results:		
	A	B		A	B
1	Original Text	=RIGHT( A1 )	1	Original Text	t
2	Original Text	=RIGHT( A2, 4 )	2	Original Text	Text

**(3) MID**

The MID function is used to extract a substring, starting in the middle of a string. It returns a specified number of characters from the middle of a supplied text string.

*Example:*

The following spreadsheet shows the use of MID function:

Formulas:			Results:		
	A	B		A	B
1	Original Text	=MID( A1, 7, 1 )	1	Original Text	a
2	Original Text	=MID( A2, 4, 7 )	2	Original Text	ginal T
3	255 years	=MID( A3, 3, 1 )	3	255 years	5

**(4) LEN**

The LEN function is used to get the length of a string. It returns the length of a supplied text string.

*Example:*

The following spreadsheet shows the use of LEN function:

Formulas:			Results:			
	A	B		A	B	C
1	test string	=LEN( A1 )	1	test string	11	
2	test string 2	=LEN( A2 )	2	test string 2	13	
3		=LEN( A3 )	3		0	- empty string has length 0

**(5) FIND**

The FIND function is used to find the position of a substring in a string. It returns the position of a specified character or sub-string within a supplied text string.

*Example:*

The following spreadsheet shows the use of FIND function:

Formulas:			Results:		
	A	B		A	B
1	Original Text	=FIND( "T", A1 )	1	Original Text	10
2	Original Text	=FIND( "t", A2 )	2	Original Text	13
3	Original Text	=FIND( "i", A3 )	3	Original Text	3
4	Original Text	=FIND( "i", A4, 4 )	4	Original Text	5

**(6) LOWER**

The LOWER function converts all characters in a supplied text string to lower case.

*Example:*

The following spreadsheet shows the use of LOWER function:

Formulas:			Results:		
	A	B		A	B
1	test	=LOWER( A1 )	1	test	test
2	TEST	=LOWER( A2 )	2	TEST	test
3	Test	=LOWER( A3 )	3	Test	test
4	TEST 332	=LOWER( A4 )	4	TEST 332	test 332

**(7) UPPER**

The UPPER function converts all characters in a supplied text string to upper case.

**Example:**

The following spreadsheet shows the use of UPPER function:

Formulas:			Results:		
	A	B		A	B
1	test	=UPPER( A1 )	1	test	TEST
2	TEST	=UPPER( A2 )	2	TEST	TEST
3	Test	=UPPER( A3 )	3	Test	TEST
4	test 332	=UPPER( A4 )	4	test 332	TEST 332

**(8) TRIM**

The TRIM function removes extra spaces (i.e. all spaces except for single spaces between words or characters) from a supplied text string.

**Example:**

The following spreadsheet shows the TRIM function applied to four different text strings:

	A	B
1	=TRIM( " trimmed text" )	- has spaces at start
2	=TRIM( "trimmed text " )	- has spaces at end
3	=TRIM( "trimmed text" )	- has additional spaces in the middle
4	=TRIM( " trimmed text " )	- has additional spaces at the start, end & in the middle

In all four of the above cases, the result is the string "**trimmed text**".

- with no spaces at the start or end and just one space in the middle.

**5.17.6 ERROR FUNCTIONS**

Error functions in Excel are a set of functions designed to handle and manage errors in formulas. These functions allow you to identify, trap, and handle errors in your spreadsheets, preventing them from causing unexpected results or crashes.

**(1) ISERROR Function:** The ISERROR function checks whether a formula evaluates to an error or not. It returns TRUE if the formula evaluates to an error and FALSE otherwise.

**Syntax:**

**ISERROR(value)**

Here,

- **value:** The formula or expression to be checked for errors.

*Example:*

=ISERROR(10/0)

This formula attempts to divide 10 by 0. Since division by 0 is an invalid operation, the formula will evaluate to an error. The ISERROR function will return TRUE in this case, indicating that an error occurred.

**(2) NA Function:** The NA function in Excel is used to represent a missing or unavailable value in a spreadsheet. It is an error value that is used to indicate that a cell does not contain any data.

To use the NA function, simply type =NA() into a cell. The cell will then display the error value #N/A.

*Syntax:*

NA()

*Example:*

Let's say you have a spreadsheet that tracks sales figures for each month of the year. For the month of January, you do not have any sales data. You can use the NA function to indicate that the sales data for January is missing:

	A	B
1	Month	Sales
2	January	NA()
3	February	1000
4	March	1500
5	April	1200
6	May	2000

By using the NA function, you can avoid errors in your formulas. For example, if you calculate the average sales for the year, the formula =AVERAGE(B2:B6) will not include the missing sales data for January.

**(3) IFERROR Function:** The IFERROR function is a versatile error-handling function in Excel that allows you to specify an alternative value to return if a formula evaluates to an error. This function is crucial for preventing errors from causing unexpected results or crashes in your spreadsheets.

*Syntax:*

IFERROR(value, value\_if\_error)

Here,

- **value:** The formula or expression to evaluate.
- **value\_if\_error:** The value to return if the formula evaluates to an error. This value can be a text message, a numeric value, another formula, or even an empty cell.

*Example:*

Let's say you have a formula `=AVERAGE(A2:A10)` that calculates the average of a range of cells, but one of the cells in the range contains invalid data.

To prevent the formula from displaying an error message and instead return a more informative message, you can use the **IFERROR function** as follows:

`=IFERROR(AVERAGE(A2:A10), "Invalid data found")`

In this example, if the `AVERAGE` formula evaluates to an error due to invalid data, the `IFERROR` function will return the text message **"Invalid data found"** instead of displaying an error message.

### 5.17.7 LOOKUP AND REFERENCE FUNCTIONS

The lookup and reference functions help you to work with arrays of data, and are particularly useful when you need to cross reference between different data sets. Some of the commonly used lookup and reference functions are discussed below:

#### (1) HLOOKUP

The `HLOOKUP` function looks up a supplied value in the first row of a table, and returns the corresponding value from another row.

*Syntax:*

`HLOOKUP(lookup_value, table_array, row_index_num, [range_lookup])`

Here,

- **lookup\_value:** The value that you want to search for, in the first row of the supplied data array (table).
- **table\_array:** The data array or table, containing the data to be searched in the top row, and the return values in any other row.
- **row\_index\_num:** The row number, within the supplied `table_array`, that you want the corresponding value to be returned from.
- **[range\_lookup]:** An optional logical argument, which can be set to `TRUE` or `FALSE`, means:

- (i) **TRUE**- if the function cannot find an exact match to the supplied `lookup_value`, it should use the closest match below the supplied value.
- (ii) **FALSE**- if the function cannot find an exact match to the supplied `lookup_value`, it should return an error.

*Example:*

Formulas:							Results:								
	A	B	C	D	E	F		A	B	C	D	E	F		
1	Exam Results Table							1	Exam Results Table						
2		Ann	Cara	Colin	Ed	Frank	2		Ann	Cara	Colin	Ed	Frank		
3	Math	58%	90%	67%	76%	80%	3	Math	58%	90%	67%	76%	80%		
4	French	61%	71%	59%	59%	76%	4	French	61%	71%	59%	59%	76%		
5	Physics	75%	45%	39%	52%	69%	5	Physics	75%	45%	39%	52%	69%		
6	Biology	39%	55%	77%	61%	45%	6	Biology	39%	55%	77%	61%	45%		
7							7								
8	Individual Student Score							8	Individual Student Score						
9	Student :	Biology Score :						9	Student :	Biology Score :					
10	Ed	=HLOOKUP( A10, A2:F6, 5, FALSE )						10	Ed	61%					

In the above example, the HLOOKUP function searches through the top row of the `table_array` (the range A2:F2), to find a match for the `lookup_value` (the name "Ed"). When the name "Ed" is found, the function returns the corresponding value from the 5th row of the `table_array`.

	A	B	C	D	E	F
1	Exam Results Table					
2		Ann	Cara	Colin	Ed	Frank
3	Math	58%	90%	67%	76%	80%
4	French	61%	71%	59%	59%	76%
5	Physics	75%	45%	39%	52%	69%
6	Biology	39%	55%	77%	61%	45%

## (2) VLOOKUP

The VLOOKUP function looks up a supplied value in the first column of a table, and returns the corresponding value from another column.

*Syntax:*

**VLOOKUP(lookup\_value, table\_array, col\_index\_num, [range\_lookup])**

Here-

- **lookup\_value:** The value that you want to look up.
- **table\_array:** The data array or table, containing the search values in the left hand columns and the return values in another column.

- **col\_index\_num**: The column number, within the supplied table\_array, that you want to return a value from.
- **[range\_lookup]**: An optional logical argument that describes what the function should return in the event that it does not find an exact match to the lookup\_value. The [range\_lookup] can be set to TRUE or FALSE, means:
  - TRUE**- If the function cannot find an exact match to the supplied lookup\_value; it should use the closest match below the supplied value.
  - FALSE**- If the function cannot find an exact match to the supplied lookup\_value, it should return an error.

*Example:*

	A	B	C	D	E
1	Item Description	Cost (\$)		Current Item:	Current Item Cost (\$)
2	Tinned Tomatoes	\$0.90		Cornflakes	=VLOOKUP( D2, A:B, 2, FALSE ) - returns the value \$3.50
3	Tinned Tuna	\$1.50			
4	Cornflakes	\$3.50			
5	Shortcake Biscuits	\$1.00			
6	Toothpaste	\$4.10			
7	Tinned Baked Beans	\$0.99			
8	White Sliced Bread	\$0.80			
	.	.			
	.	.			
9	.	.			

The above VLOOKUP function returns the price for "**Cornflakes**", which is **\$3.50**.

In this example:

- The **lookup\_value** is the text string "Cornflakes", which is located in cell D2;
- The **table\_array** is columns A-B of the spreadsheet;
- The **col\_index\_num** is set to 2, to denote that the value returned should be taken from column 2 of the table\_array;

The **[range\_lookup]** argument is set to FALSE, to indicate that we only want a result to be returned if an exact match to the lookup\_value is found.

### 5.17.8 FINANCIAL FUNCTIONS

Excel provides a wide range of financial functions that are useful for financial analysis,

calculations, and modeling. Here are some important financial functions in Excel with suitable examples:

### (1) PMT (Payment)

The PMT function calculates the periodic payment for a loan or investment based on a constant interest rate, a fixed number of periods, and a present value.

*Example:* Suppose you want to calculate the monthly payment for a 5,00,000 loan with an annual interest rate of 8% for a term of 5 years. The formula would be:

$$=PMT(8\%/12, 5*12, -500000)$$

The result would give you the monthly payment amount. In the above example, the result would be ₹10,138.20.

### (2) PV (Present Value)

The PV function calculates the present value of an investment.

*Example:* Let's say you are considering an investment that will pay you ₹1,000 per year for the next 5 years, with an interest rate of 8%. The formula would be:

$$=PV(8\%, 5, -1000)$$

The result would give you the present value of the investment. In the above example, the result would be ₹3,992.71.

### (3) FV (Future Value)

The FV function calculates the future value of an investment based on a constant interest rate, a fixed number of periods, and regular periodic payments.

*Example:* Let's say you invest ₹1,000 per month into an account with an annual interest rate of 7% for a period of 10 years. You can use the FV function to calculate the future value of the investment. The formula would be:

$$=FV(7\%/12, 10*12, -1000)$$

The result would give you the total value of the investment at the end of the 10-year period. In the above example, the result would be ₹1,73,084.81.

### (4) RATE

The RATE function calculates the interest rate per period for an investment or loan based on regular periodic payments.

*Example:* Let's say you are considering a loan with a monthly payment of ₹10,174 for a



period of 5 years and a present value of ₹ 5,00,000. You can use the RATE function to calculate the interest rate. The formula would be:

$$=RATE(5*12, -10174, 500000)$$

This formula would return the interest rate per month, which is 0.68%. To calculate the annual interest rate, you would multiply the monthly interest rate by 12. Then, the formula would be:

$$=RATE(5*12, -10174, 500000) * 12$$

The final result would be **8.15%**.

### (5) NPER

The NPER function is used to calculate the number of periods required to pay off a loan or investment based on fixed, periodic payments and a constant interest rate. It stands for "Number of Periods."

*Example:* Suppose you take out a loan of \$10,000 at an annual interest rate of 5%, and you plan to make monthly payments of \$200. You want to know how many months it will take to pay off the loan.

The formula would be:

$$=NPER(5%/12, -200, 10000)$$

Here,

- **rate:** 5% annual interest rate, so 5%/12 for monthly rate.
- **payment:** Monthly payment is -200 (negative because it's an outgoing payment).
- **present\_value:** Loan amount is 10,000.

The result would be **56.1843** number of periods (months) required to pay off the loan.

### (6) NPV

The NPV function is used to calculate the net present value of an investment based on a series of future cash flows, discounted at a specified rate. NPV stands for Net Present Value.

*Example:* Suppose you are considering an investment that costs \$1,000 today (Year 0), and it generates cash flows of \$500 at the end of Year 1 and \$700 at the end of Year 2. You want to calculate the NPV of this investment with a discount rate of 5%.

The formula would be:

$$=NPV(5%, -1000, 500, 700)$$

Here,

- **Rate (Discount Rate):** 5%
- **Cash Flows:**
  - **Year 0:** -\$1,000 (initial investment, negative because it's an outflow)
  - **Year 1:** \$500 (inflow)
  - **Year 2:** \$700 (inflow)

The NPV (Net Present Value) would be **\$105.82**.

### 5.17.9 DATABASE FUNCTIONS

Excel has a number of database functions that you can use to find specific information from the database based on set criteria.

The database functions perform basic operations, such as sum, average, count, etc., but they also have criteria arguments, that allow you to only perform the calculation for a specified subset of the records in your database.

#### (1) DSUM Function

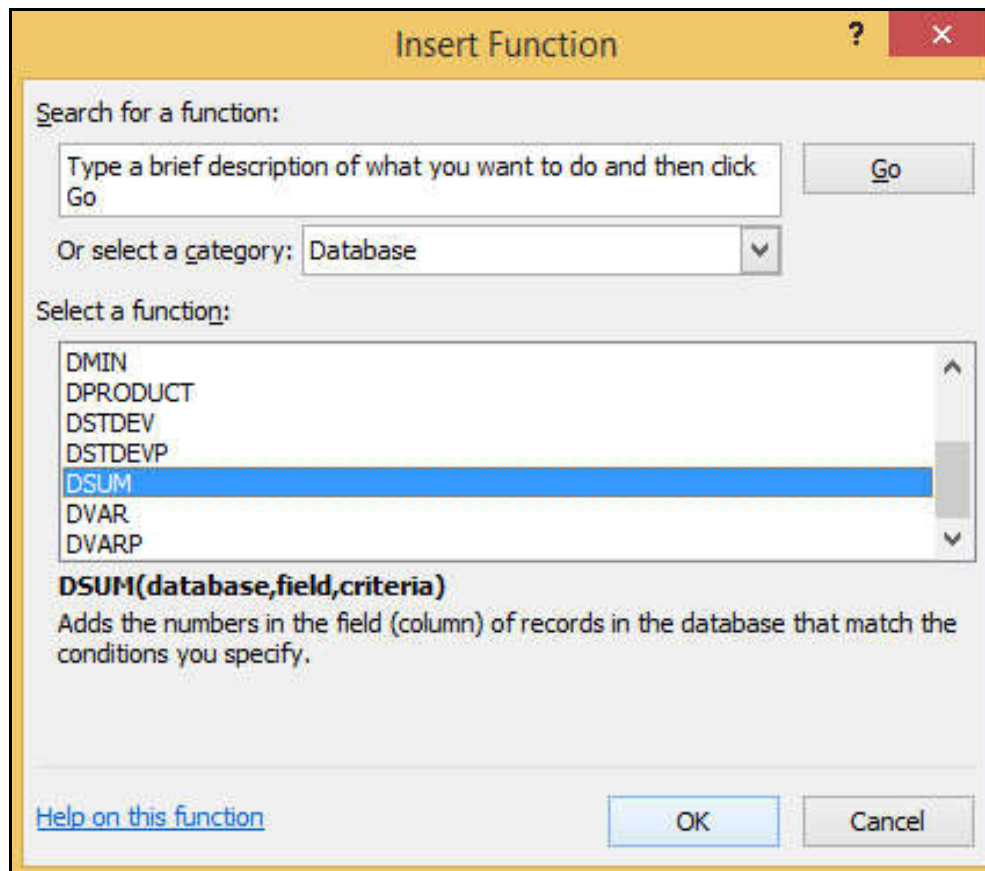
The DSUM function calculates the sum of values in a field of a list or database that satisfies specified conditions.

*Example:*

- (i) Create a new worksheet and enter the database list, as shown below:

	A	B	C	D	E	F	G
1	<b>Invoice</b>	<b>Month</b>	<b>Sales Person</b>	<b>Product</b>	<b>Sales Value</b>		
2	A001	February	Rahul	Monitor	5000		
3	A002	February	Sanjeev	Scanner	4000		
4	A003	February	Puneet	Plotter	3000		<b>Sales Person</b>
5	A004	February	Saransh	CDROM	20		Puneet
6	A005	February	Pranav	Keyboard	500		
7	A006	March	Rajesh	Mouse	300		
8	A007	March	Jimmy	Printer	4500		
9							
10	<b>What is the total sales value for Puneet ?</b>				<input type="text"/>		
11							

- (ii) Click the cell E10.  
(This is where you want to place the total sales value for sales person "Puneet".)
- (iii) Click on **Formulas** Tab → **Function Library** Group → **Insert Function** Command. **Insert Function** dialog box appears.
- (iv) In the **select a category** box, click the **drop-down arrow** and click **Database** from the list. In the **Select a function** box, scroll down and click **DSUM** function.



- (v) Click **OK** button.
- (vi) **Function Arguments** dialog box appears.
- In the **Database** box, select the range **A1:E8**.
  - In the **Field** box, select the cell **E1**.
  - In the **Criteria** box, select the range **G4:G5**.

The arguments for the function are shown below:

**Function Arguments**

DSUM

**Database** A1:E8 = {"Invoice", "Month", "Sales Person", "Prod  
**Field** E1 = "Sales Value"  
**Criteria** G4:G5 = G4:G5

= 3000

Adds the numbers in the field (column) of records in the database that match the conditions you specify.

**Criteria** is the range of cells that contains the conditions you specify. The range includes a column label and one cell below the label for a condition.

Formula result = 3000

[Help on this function](#)

(vii) Click the OK button. The result is shown on the worksheet.

	A	B	C	D	E	F	G
1	<b>Invoice</b>	<b>Month</b>	<b>Sales Person</b>	<b>Product</b>	<b>Sales Value</b>		
2	A001	February	Rahul	Monitor	5000		
3	A002	February	Sanjeev	Scanner	4000		
4	A003	February	Puneet	Plotter	3000		<b>Sales Person</b>
5	A004	February	Saransh	CDROM	20		Puneet
6	A005	February	Pranav	Keyboard	500		
7	A006	March	Rajesh	Mouse	300		
8	A007	March	Jimmy	Printer	4500		
9							
10	<b>What is the total sales value for Puneet ?</b>				<b>3000</b>		

## (2) DAVERAGE Function

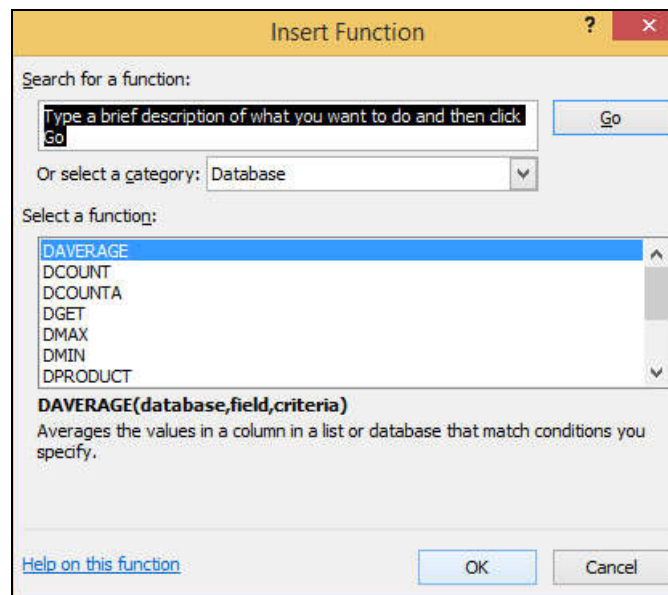
The DAVERAGE function calculates the average of values in a field of a list or database that satisfies specified conditions.

*Example:*

- (i) Create a new worksheet and enter the database list, as shown below:

	A	B	C	D	E	F	G
1	Invoice	Month	Sales Person	Product	Sales Value		
2	A001	February	Rahul	Monitor	5000		
3	A002	February	Sanjeev	Scanner	4000		
4	A003	February	Puneet	Plotter	3000		Sales Person
5	A004	February	Saransh	CDROM	20		Puneet
6	A005	February	Pranav	Keyboard	500		
7	A006	March	Rajesh	Mouse	300		
8	A007	March	Jimmy	Printer	4500		
9							
10	What is the total sales value for Puneet ?				3000		
11	What is the average sales value for Puneet ?						

- (ii) Click the cell E11.  
(This is where you want to place the average sales value for sales person "Puneet".)
- (iii) Click on **Formulas** Tab → **Function Library** Group → **Insert Function** Command. **Insert Function** dialog box appears.
- (iv) In the **select a category** box, click the **drop-down arrow** and click **Database** from the list. In the **Select a function** box, scroll down and click **DAVERAGE** function.



- (v) Click OK button.
- (vi) **Function Arguments dialog box** appears.
- In the **Database box**, select the range **A1:E8**.
  - In the **Field box**, select the cell **E1**.
  - In the **Criteria box**, select the range **G4:G5**.

The arguments for the function are shown below:

Function Arguments

DAVERAGE

Database: A1:E8 = {"Invoice", "Month", "Sales Person", "Prod

Field: E1 = "Sales Value"

Criteria: G4:G5 = G4:G5

= 3000

Averages the values in a column in a list or database that match conditions you specify.

**Criteria** is the range of cells that contains the conditions you specify. The range includes a column label and one cell below the label for a condition.

Formula result = 3000

[Help on this function](#) OK Cancel

- (vii) Click the OK button. The result is shown on the worksheet.

	A	B	C	D	E	F	G
1	Invoice	Month	Sales Person	Product	Sales Value		
2	A001	February	Rahul	Monitor	5000		
3	A002	February	Sanjeev	Scanner	4000		
4	A003	February	Puneet	Plotter	3000		Sales Person
5	A004	February	Saransh	CDROM	20		Puneet
6	A005	February	Pranav	Keyboard	500		
7	A006	March	Rajesh	Mouse	300		
8	A007	March	Jimmy	Printer	4500		
9							
10	What is the total sales value for Puneet ?				3000		
11	What is the average sales value for Puneet ?				3000		

### (3) DMAX Function

The DMAX function returns the maximum value from a field of a list or database that satisfies specified conditions.

*Example:*

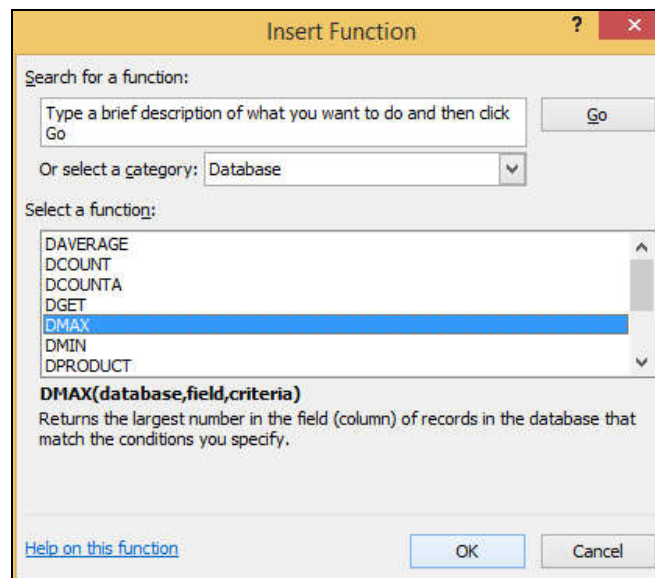
- (i) Create a new worksheet and enter the database list, as shown below:

	A	B	C	D	E	F	G	H
1	<b>Invoice</b>	<b>Month</b>	<b>Sales Person</b>	<b>Product</b>	<b>Sales Value</b>			
2	A001	February	Rahul	Monitor	5000			
3	A002	February	Sanjeev	Scanner	4000			
4	A003	February	Puneet	Plotter	3000		<b>Sales Person</b>	<b>Month</b>
5	A004	February	Saransh	CDROM	20		Puneet	February
6	A005	February	Pranav	Keyboard	500			
7	A006	March	Rajesh	Mouse	300			
8	A007	March	Jimmy	Printer	4500			
9								
10	What is the total sales value for Puneet ?				3000			
11	What is the average sales value for Puneet ?				3000			
12	What is the highest sales value for Puneet in February ?							

- (ii) Click the cell E12.

(This is where you want to place the highest sales value for sales person “Puneet” in February.)

- (iii) Click on **Formulas** Tab → **Function Library** Group → **Insert Function** Command. **Insert Function** dialog box appears.
- (iv) In the **select a category** box, click the **drop-down arrow** and click **Database** from the list. In the **Select a function** box, scroll down and click **DMAX** function.



- (v) Click **OK** button.
- (vi) **Function Arguments** dialog box appears.
- In the **Database** box, select the range **A1:E8**.
  - In the **Field** box, select the cell **E1**.
  - In the **Criteria** box, select the range **G4:H5**.

The arguments for the function are shown below:

The screenshot shows the 'Function Arguments' dialog box for the DMAX function. The dialog has a title bar with a question mark and a close button. The main area is titled 'DMAX' and contains three input fields: 'Database' with the value 'A1:E8', 'Field' with the value 'E1', and 'Criteria' with the value 'G4:H5'. To the right of each field is a small icon and a description: 'Database' is described as '{ "Invoice", "Month", "Sales Person", "Prod', 'Field' as '"Sales Value"', and 'Criteria' as 'G4:H5'. Below these fields, the result is shown as '= 3000'. A descriptive text below reads: 'Returns the largest number in the field (column) of records in the database that match the conditions you specify. Criteria is the range of cells that contains the conditions you specify. The range includes a column label and one cell below the label for a condition.' At the bottom, it says 'Formula result = 3000' and has 'OK' and 'Cancel' buttons. A 'Help on this function' link is also present.

- (vii) Click the **OK** button. The result is shown on the worksheet.

	A	B	C	D	E	F	G	H
1	<b>Invoice</b>	<b>Month</b>	<b>Sales Person</b>	<b>Product</b>	<b>Sales Value</b>			
2	A001	February	Rahul	Monitor	5000			
3	A002	February	Sanjeev	Scanner	4000			
4	A003	February	Puneet	Plotter	3000		<b>Sales Person</b>	<b>Month</b>
5	A004	February	Saransh	CDROM	20		Puneet	February
6	A005	February	Pranav	Keyboard	500			
7	A006	March	Rajesh	Mouse	300			
8	A007	March	Jimmy	Printer	4500			
9								
10	<b>What is the total sales value for Puneet ?</b>				3000			
11	<b>What is the average sales value for Puneet ?</b>				3000			
12	<b>What is the highest sales value for Puneet in February ?</b>				3000			

#### (4) DCOUNTA Function

The DCOUNTA function returns the number of non-blank cells in a field of a list or database that satisfies specified conditions.



*Example:*

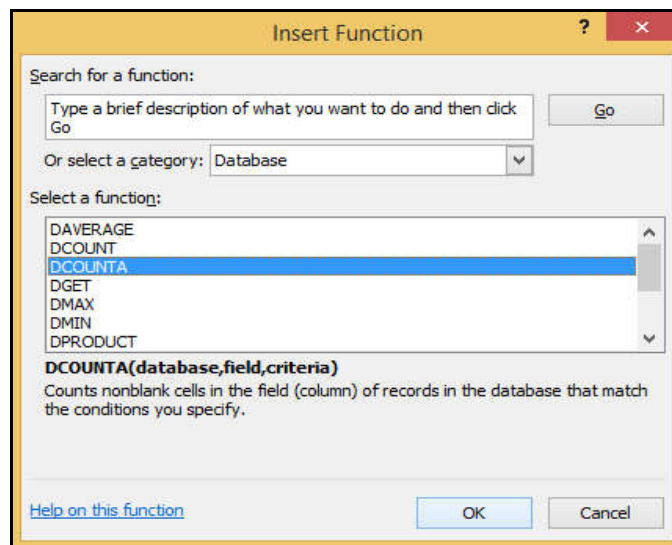
- (i) Create a new worksheet and enter the database list, as shown below:

	A	B	C	D	E	F	G	H
1	Invoice	Month	Sales Person	Product	Sales Value			
2	A001	February	Rahul	Monitor	5000			
3	A002	February	Sanjeev	Scanner	4000			
4	A003	February	Puneet	Plotter	3000		Sales Person	Month
5	A004	February	Saransh	CDROM	20		Puneet	February
6	A005	February	Pranav	Keyboard	500			
7	A006	March	Rajesh	Mouse	300			
8	A007	March	Jimmy	Printer	4500			
9								
10	What is the total sales value for Puneet ?				3000			
11	What is the average sales value for Puneet ?				3000			
12	What is the highest sales value for Puneet in February ?				3000			
13	How many records for Puneet in February ?							

- (ii) Click the cell E13.

(This is where you want to count the occurrences of records for sales person "Puneet" in February.)

- (iii) Click on **Formulas** Tab → **Function Library** Group → **Insert Function** Command. **Insert Function** dialog box appears.
- (iv) In the **select a category** box, click the **drop-down arrow** and click **Database** from the list. In the **Select a function** box, scroll down and click **DCOUNTA** function.



- (v) Click **OK** button.
- (vi) **Function Arguments dialog box** appears.
- In the **Database box**, select the range **A1:E8**.
  - In the **Field box**, select the cell **A1**.  
(You can use any field in the database because the function is counting the occurrences, not the value in the field.)
  - In the **Criteria box**, select the range **G4:H5**.

The arguments for the function are shown below:

The screenshot shows the 'Function Arguments' dialog box for the DCOUNTA function. The dialog has a title bar with a question mark and a close button. The function name 'DCOUNTA' is displayed at the top left. Below it, three input fields are shown: 'Database' with the value 'A1:E8', 'Field' with the value 'A1', and 'Criteria' with the value 'G4:H5'. To the right of each field is a small icon and a list of values: for Database, it lists '{ "Invoice", "Month", "Sales Person", "Prod'; for Field, it lists '"Invoice"'; and for Criteria, it lists 'G4:H5'. Below these fields, the formula result is shown as '= 1'. A descriptive text explains that the function counts nonblank cells in the field of records in the database that match the conditions. A note defines 'Criteria' as the range of cells that contains the conditions you specify. At the bottom, there is a 'Formula result = 1' and a 'Help on this function' link. The 'OK' and 'Cancel' buttons are at the bottom right.

- (vii) Click the **OK** button. The result is shown on the worksheet.

	A	B	C	D	E	F	G	H
1	Invoice	Month	Sales Person	Product	Sales Value			
2	A001	February	Rahul	Monitor	5000			
3	A002	February	Sanjeev	Scanner	4000			
4	A003	February	Puneet	Plotter	3000		Sales Person	Month
5	A004	February	Saransh	CDROM	20		Puneet	February
6	A005	February	Pranav	Keyboard	500			
7	A006	March	Rajesh	Mouse	300			
8	A007	March	Jimmy	Printer	4500			
9								
10	What is the total sales value for Puneet ?				3000			
11	What is the average sales value for Puneet ?				3000			
12	What is the highest sales value for Puneet in February ?				3000			
13	How many records for Puneet in February ?				1			

## 5.18 AUTOSUM FUNCTION

The *AutoSum* function provides a shortcut to adding up columns or rows of numbers in an Excel spreadsheet. It is used to sum the values of columns or rows with a single click.

### How to use AutoSum?

- Type the numbers to be included in the formula in separate cells of a column in worksheet.

	A	B	C	D	E	F	G
1							
2		128					
3		345					
4		243					
5		97					
6		187					
7							

- Highlight the range of numbers to be added, from cell B2 to cell B6.

	A	B	C	D	E	F
1						
2		128				
3		345				
4		243				
5		97				
6		187				
7						
8						

- Click the **Home** tab → **Editing** group → **AutoSum** command.

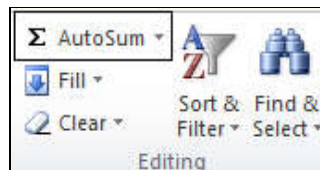


Fig. 5.69 (AutoSum Command)

- The sum of the numbers will be added to cell B7, or the cell immediately beneath the defined range of numbers.

	A	B	C	D	E	F
1						
2		128				
3		345				
4		243				
5		97				
6		187				
7		1000				
8						

- Notice the formula, =SUM(B2:B6), has been defined to cell B7.

	A	B	C	D	E
1					
2		128			
3		345			
4		243			
5		97			
6		187			
7		1000			
8					

## 5.19 SPEEDING UP DATA ENTRY

Excel provides some speedy tools to enter data in a faster and smarter way than via the keyboard.

### 5.19.1 FILL TOOL

*Fill tool* is a way to duplicate existing content. It basically helps you fill in sequential data without having to type in every cell.

#### To Use Fill Tool:

- Start by selecting the cell to copy. You will notice a small square- called a *Fill handle*- in the bottom right-hand corner of the cell.

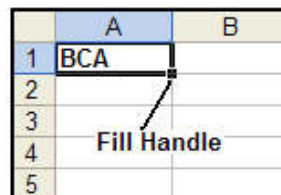
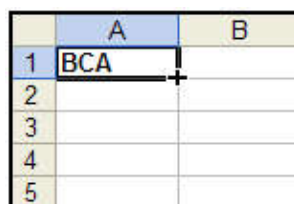


Fig. 5.70 (Fill Handle)

- Hold your *mouse pointer* over the *fill handle*, it will change to a *plus sign (+)*.



- Click on the + sign and drag the mouse in any direction (*Down, Up, Right or Left*).

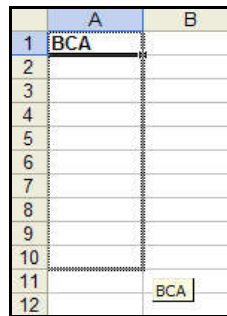


Fig. 5.71 (Use of Fill Handle)

OR

- Hold down the *Shift* key and click in the last cell you want to fill. Thereafter, click on **Home** tab → **Editing** group → **Fill** command. A **drop-down list** will be appeared. Select the direction (*say- down*) in which you want to copy.

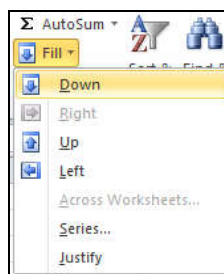


Fig. 5.72 (Fill Command)

- The result would be look like:

	A	B
1	BCA	
2	BCA	
3	BCA	
4	BCA	
5	BCA	
6	BCA	
7	BCA	
8	BCA	
9	BCA	
10	BCA	
11		
12		

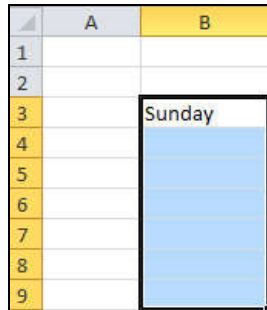
**Note:** If the cell contains a number, the number will fill in series. If the cell contains text, the same text will fill in the direction you choose.

### 5.19.2 FILL SERIES

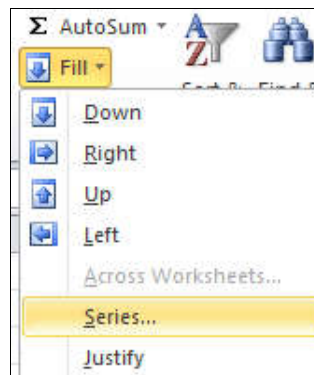
A more complex use of the *Fill Tool* is to use a *Fill Series*. The default lists are for the full and abbreviated days of the week and the months of the year, but you can create your own lists as well.

**To Add a Fill Series to a Spreadsheet:**

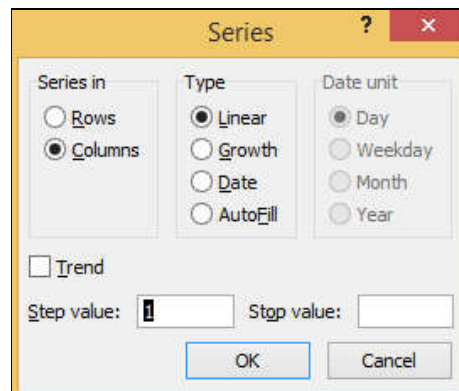
- Type the starting value for the series and then select the cells to fill.



- Click on **Home** tab → **Editing** group → **Fill** command. A **drop-down list** will be appeared. Select the **Series** option from the list.

**Fig. 5.73** (Fill Series)

- **Series dialog box** will be displayed.

**Fig. 5.74** (Series Dialog box)

- In the **Series dialog box**, select **AutoFill** as the **Series type**.
- Click **OK**.

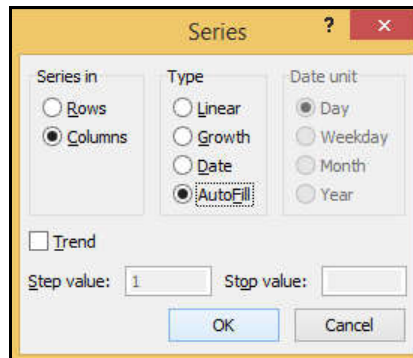


Fig. 5.75 (Series Dialog box: AutoFill Type)

- The selected cells then fill in the other items on the list sequentially, repeating from the top of the list when they reach the end of the list.

	A	B	C
1			
2			
3		Sunday	
4		Monday	
5		Tuesday	
6		Wednesday	
7		Thursday	
8		Friday	
9		Saturday	

Fig. 5.76 (Fill Series Result)

## 5.20 CONDITIONAL FORMATTING

A format, such as *cell shading* or *font color*, that Excel automatically applies to cells if a specified condition is true.

*Conditional formatting* is a special formatting feature of *Excel* that sets a cell's format according to conditions that you specify.

Conditional formatting allows you to present numeric data in different colors; For example, you can shade data depending on whether the value is greater, equal to, or less than zero.

### **Example:**

To apply different shades to the rows / cells of a worksheet, follow these steps:

- Start *Excel*, and then open **New Worksheet**.

- Type the following data in cells A1:D5:

	A	B	C	D
1	Name	Class	Roll No.	Marks
2	Mohit	BCA	A101	77
3	Rahul	BBA	B201	66
4	Amit	MCA	M301	54
5	Prince	MBA	C101	85

- Select the range D2:D5.

	A	B	C	D
1	Name	Class	Roll No.	Marks
2	Mohit	BCA	A101	77
3	Rahul	BBA	B201	66
4	Amit	MCA	M301	54
5	Prince	MBA	C101	85

- In **Home** tab, under **Styles** group, click **Conditional Formatting** command. A drop down list will be displayed. Click **Highlight Cells Rules** → **Greater Than**.

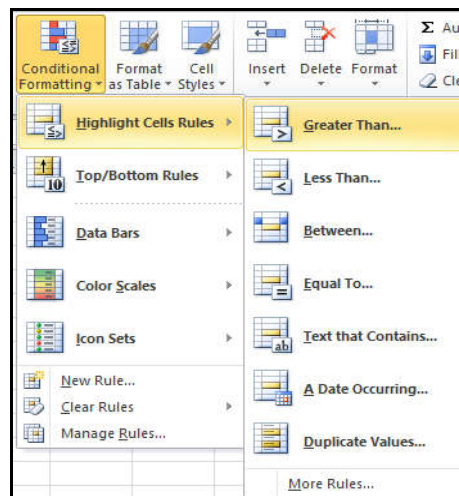


Fig. 5.77 (Conditional Formatting Command)

- Greater Than** dialog box will be appeared.

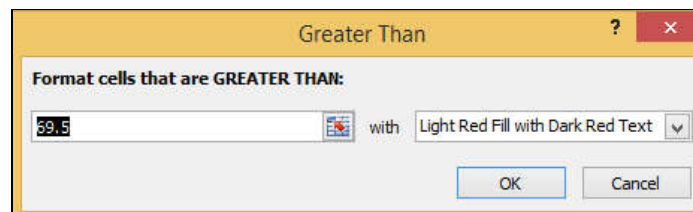
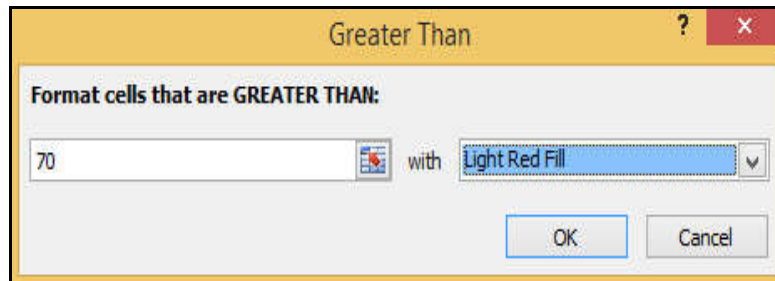


Fig. 5.78 (Greater Than Dialog box)



- Enter value 70 in the **GREATER THAN** field and select “Light Red Fill” option from the “with: drop down list”.



- Click **OK**.
- The final result of conditional formatting would be look like:

	A	B	C	D
1	<b>Name</b>	<b>Class</b>	<b>Roll No.</b>	<b>Marks</b>
2	Mohit	BCA	A101	77
3	Rahul	BBA	B201	66
4	Amit	MCA	M301	54
5	Prince	MBA	C101	85

## 5.21 PRINTING WORKSHEETS

Printing in *Excel* is much like printing in other Office applications like *Microsoft Word*. By default, *Excel* prints the entire worksheet.

*Print Preview* is a method to review the formatting and make sure the columns, rows, and margins appear exactly as you want them.

In *Excel 2010*, you can print and preview files from the same location by clicking **File** and then **Print** (or pressing *CTRL+P*).

*Excel* allows you to print all or part of a worksheet or workbook, with just the information you need.

### To View the Print pane:

- Click the **File** tab. This takes you to **Backstage view**.
- Select **Print**. The **Print pane** appears, with the **print settings** on the left and **Print Preview** on the right.

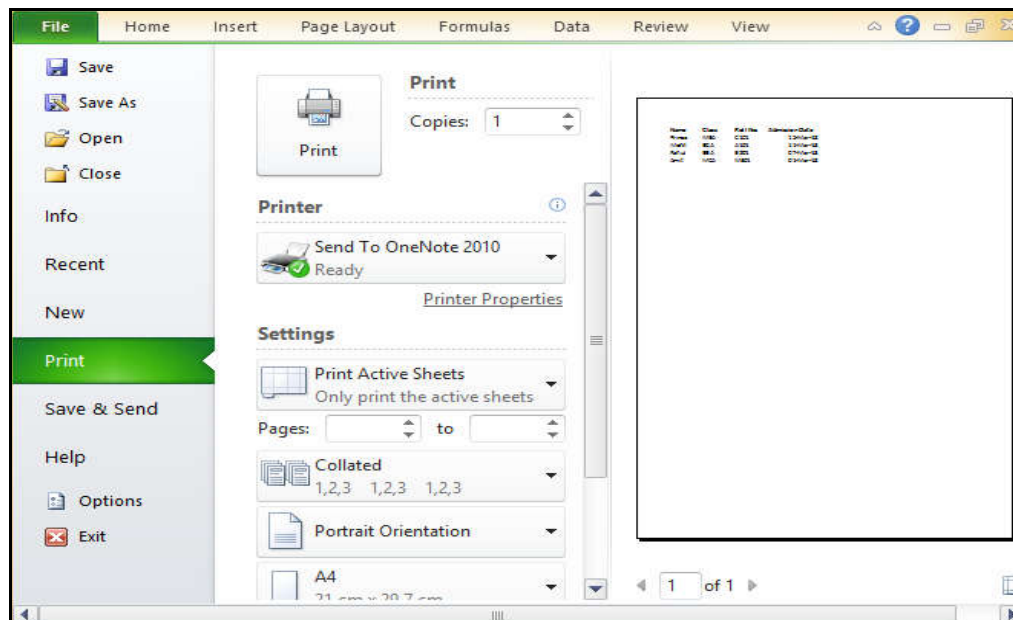


Fig. 5.79 (Print Pane Window)

### 5.21.1 USING PRINT RANGES

By default, Excel prints the whole worksheet. Sometimes, you only need to print some specific ranges instead of the whole worksheet for saving paper and printer ink.

This section will talk about how to print multiple cell ranges in Microsoft Excel.

#### To Print a Worksheet:

- Select the worksheets that you want to print.
- To print multiple worksheets, click the first worksheet, hold down the **Ctrl** key, then click the other worksheets you want to select.
- Click **File**, and then click **Print**.

OR

Press **Ctrl+P**. The Print pane window appears.

- Click the **Print** button.

#### To Print Active sheet:

- A worksheet is considered active if it is **selected**.
- Select the worksheets you want to print.
- Click the **File** tab → **Print** to access the **Print** pane.

- Select **Print Active Sheets** from the **print range** drop-down menu.

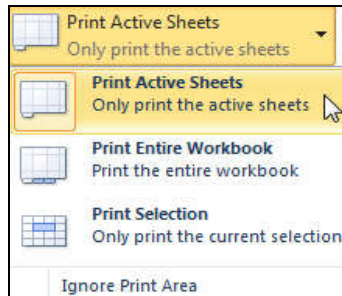


Fig. 5.80 (Print Active Sheets)

- Click the **Print** button.

#### To Print the Entire Workbook:

- Click the **File** tab → **Print** to access the **Print** pane.
- Select **Print Entire Workbook** from the **print range** drop-down menu.

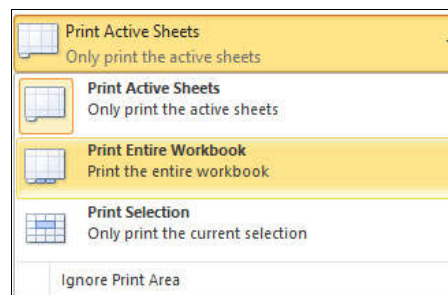


Fig. 5.81 (Print Entire Workbook)

- Click the **Print** button.

#### To Print a Selection:

- Select the cells you want to print.
- Click the **File** tab → **Print** to access the **Print** pane.
- Select **Print Selection** from the **print range** drop-down menu.

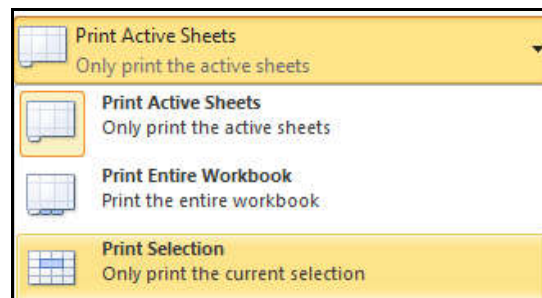


Fig. 5.82 (Print Selection)

- You can see what your selection will look like on the page in **Print Preview**.
- Click the **Print** button.

**To Print only Selected Cell Ranges:**

- Hold down the **Ctrl** key to select the non-contiguous ranges or cells.
- Click **Page Layout** tab → **Page Setup** group → **Print Area** command. From the drop down list, select **Set Print Area**.



Fig. 5.83 (Print Selected Cell Ranges)

- The selected ranges will be surrounded by a dotted line. Click **File** → **Print** to start printing the ranges one by one.

**Note:** This Set Print Area command only allows you to select and print cell ranges in the active worksheet. If you switch to another worksheet, the previous set print areas will be cleared.

### 5.21.2 PAGE ORIENTATION

*Page orientation* controls the way in which information is printed on the page. You can print a worksheet in *landscape* or *portrait* orientation. Portrait is useful for worksheets needing to fit *more rows* on one page, while landscape is useful for worksheets needing to fit *more columns* on one page.

**To Change Page Orientation:**

- Click the **File** tab → **Print** to access the **Print pane**.



Fig. 5.84 (Page Orientation: Portrait Or Landscape)

- Select either **Portrait Orientation** or **Landscape Orientation** from the **orientation** drop-down menu.
- Page orientation for the worksheet will be changed.

### 5.21.3 INSERTING AND REMOVING PAGE BREAKS

There are two different kinds of page breaks in Excel:

- (i) Soft page breaks
- (ii) Hard page breaks

A *soft page break* is automatically inserted into a spreadsheet when there is too much data to fit on one page.

A *hard page break* is one that you can insert into a spreadsheet, wherever you want it to appear.

**To Insert a Page Break:**

- Move the cursor to the row where a page break needs to be inserted. This row will be the first row on the new page.
- Click the Page Layout tab → **Page Setup** group → **Breaks** command → Insert Page Break option.

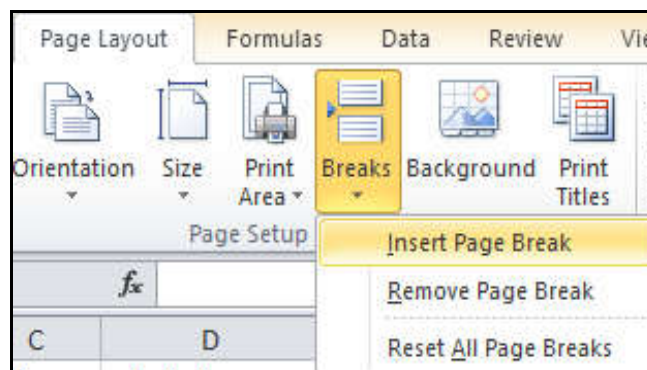


Fig. 5.85 (Inserting a Page Break)

- A page break, indicated by a dashed line, is inserted into the worksheet.
- You can go to **Print Preview** to confirm that it appears in the correct place on the page.

**To Remove a Page Break:**

- Move the cursor to the row where a page break appears.

- Click the Page Layout tab → Page Setup group → Breaks command → Remove Page Break option.

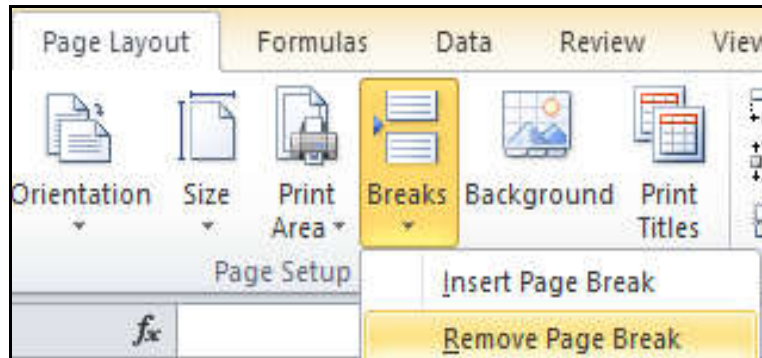


Fig. 5.86 (Removing a Page Break)

- The page break (represented by a dashed line) is removed from the page.

## 5.22 GRAPHICAL REPRESENTATION OF DATA

*Charts (also known as graphs)* are a visual representation of data in a worksheet. *Charts* allow you to present data entered into the worksheet in a visual format using a variety of graph types. Charts make it easy to see comparisons, patterns, and trends in data. It includes the design area, gridlines, and values. By using elements such as columns (in a column chart) or lines (in a line chart), a chart displays series of numeric data in a graphical format. It works by drawing figures that would represent numbers, adding colors and shapes to the information presented.

The graphical format of a chart makes it easier to understand large quantities of data and the relationship between different series of data. A chart can also show the big picture so that you can analyze your data and look for important trends.

### 5.22.1 ORGANIZING CHARTS AND GRAPHS

Before to create a chart, you must have some numeric data values stored in the cells of a worksheet. Normally, the data that a chart uses can reside in a single worksheet, or in multiple worksheets.

#### 5.22.1.1 COMPONENTS OF A CHART

In *Excel*, a chart comprises of following components:

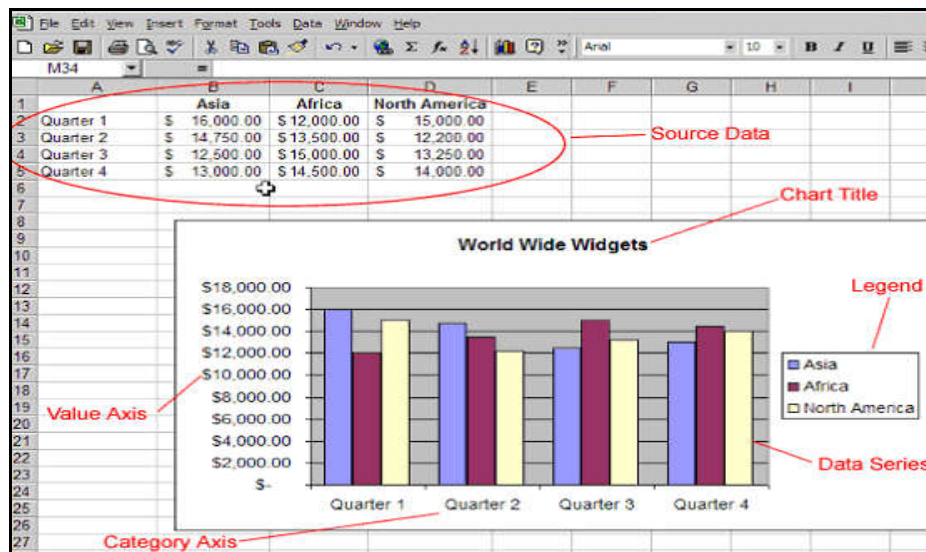


Fig. 5.87 (Components of a Chart)

- **Source Data**
  - This is the range of cells that make up a chart. The chart is updated automatically whenever the information in these cells changes.
- **Title**
  - This is the title of the chart.
- **Legend**
  - This is the chart key, which describes what each color on the chart represents.
- **Axis**
  - This is the vertical and horizontal parts of a chart. The vertical axis is often referred to as the *Y axis*, while the horizontal axis is referred to as the *X axis*.
- **Data Series**
  - This is the actual charted values, which usually are rows or columns of the source data.
- **Value Axis**
  - This is the axis that represents the values or units of the source data.
- **Category Axis**
  - This is the axis identifying each data series.

### 5.22.1.2 TYPES OF CHARTS

Excel allows you to create different kinds of charts or graphs.

- **AREA CHART**

- *Area chart* emphasizes the trend of each value over time. An area chart also shows the relationship of parts to a whole.

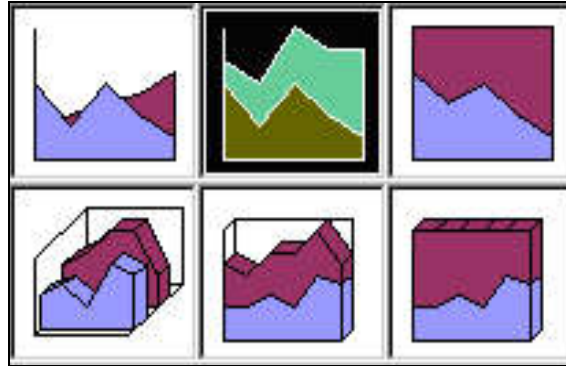


Fig. 5.88 (Area Chart)

- **COLUMN CHART**

- *Column chart* uses vertical bars or columns to represent data. They can work with many different types of data, but they are most frequently used for comparing information.

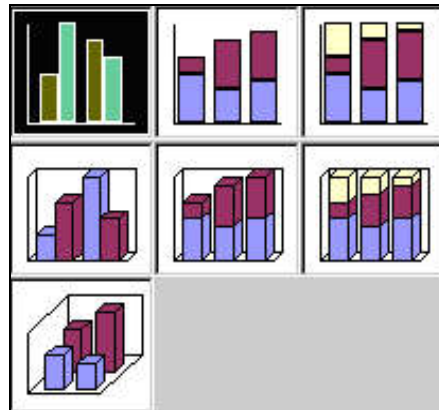


Fig. 5.89 (Column Chart)

- **BAR CHART**

- *Bar chart* is similar to a column chart except these use horizontal instead of vertical bars. Like the column chart, the bar chart shows variations in value over time.



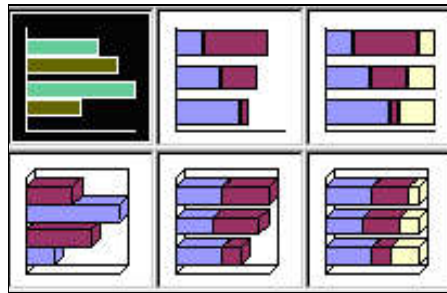


Fig. 5.90 (Bar Chart)

- **LINE CHART**

- *Line chart* shows trends and variations in data over time. A line chart displays a series of points, called *data points* that are connected over time. The data points are connected with lines, making it easy to see whether values are increasing or decreasing over time.

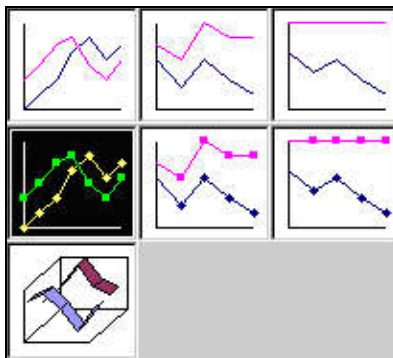


Fig. 5.91 (Line Chart)

- **PIE CHART**

- *Pie chart* displays the contribution of each value to the total. Pie charts are a very effective way to display information when you want to represent different parts of the whole, or the percentages of a total. In Pie chart, each value is shown as a slice of the pie, so it is easy to see which values make up the percentage of a whole.



Fig. 5.92 (Pie Chart)

### 5.22.1.3 EMBEDDED CHART

Embedded charts are charts that reside in the same worksheet as the source data i.e. if a chart resides in a worksheet along with worksheet data, then that kind of chart is called an *embedded chart*.

In Excel, either you can print an embedded chart as part of the data on the worksheet or you can print an embedded chart by itself without the supporting worksheet data i.e. you can print embedded charts only one by one by selecting the charts from the worksheet.

An Excel *Chart Sheet* is a worksheet tab that only contains the Excel charts. Thus, it is called a Chart Sheet. You can place more than one chart on a chart sheet.

#### 5.22.1.3.1 CREATING A CHART / EMBEDDED CHART

To create a chart or an embedded chart, you must first enter the data into a worksheet. This section explains how you can create simple embedded charts from the data.

##### To Create a Chart:

- First of all, enter the data into the worksheet and highlight all the cells that will be included in the chart including the *column titles* and the *row labels*. These cells will be the *source data* for the chart.

	A	B	C	D
1	<b>Marks</b>			
2		<b>Math</b>	<b>English</b>	<b>Science</b>
3	Ricky	88	90	78
4	Vikas	65	66	87
5	Mohit	87	79	72
6	Pranav	58	55	66

Fig. 5.93 (Highlight the cells that will be included in the chart)

- Click the **Insert** tab. In the **Charts** group, select the desired **Chart Category** (say-**Column**).

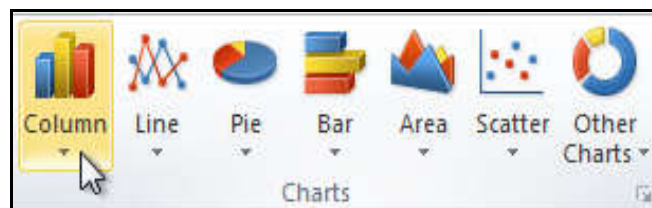


Fig. 5.94 (Selecting Chart Category)

- Select the desired **Chart type** from the drop-down menu (say- **Clustered Column**).

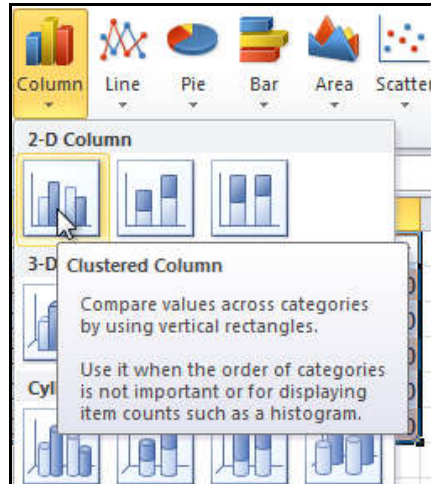


Fig. 5.95 (Selecting Chart Type Under Chart Category)

- The chart will appear in the worksheet.

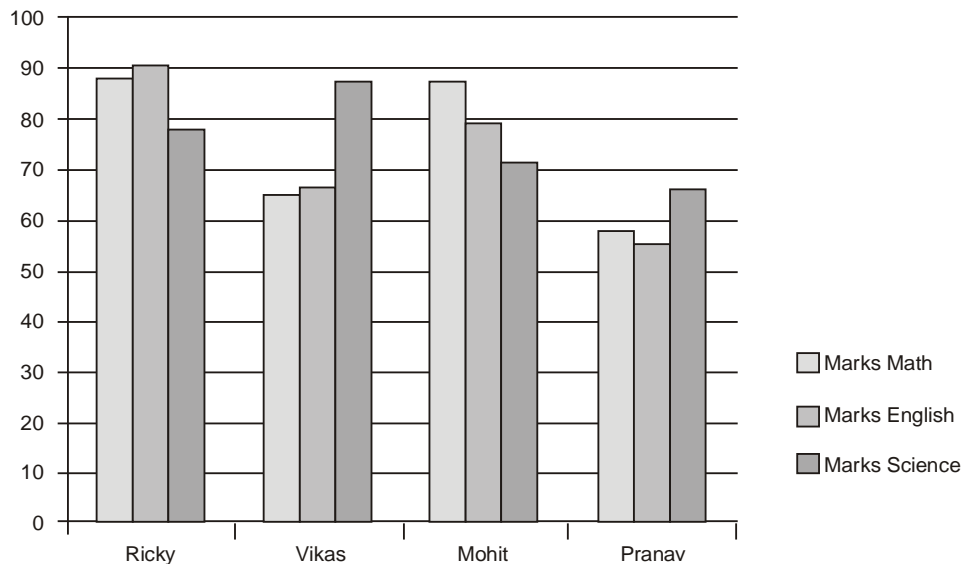


Fig. 5.96 (Chart)

#### 5.22.1.4 CHANGING CHART TYPES

To Change the Chart Type:

- Select the chart and click the **Design tab**. In the **Type** group, click the **Change Chart Type** command.

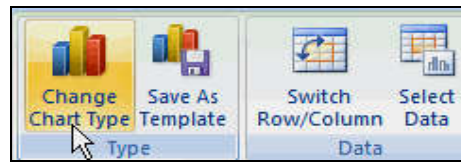


Fig. 5.97 (Chart: Change Chart Type Command)

- **Change Chart Type dialog box** appears.

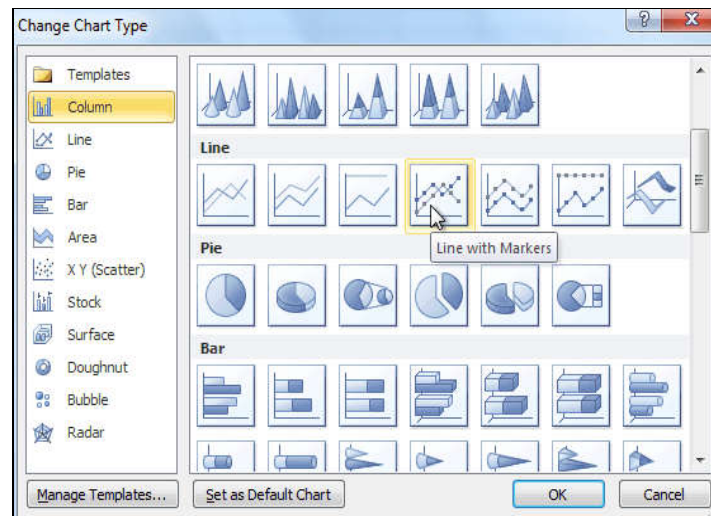


Fig. 5.98 (Change Chart Type Dialog box)

- Select the desired chart type, and then click **OK**.

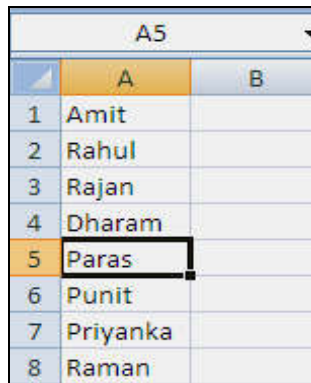
## 5.23 SORTING

A spreadsheet can contain a huge amount of information. With more rows and columns than previous versions, Excel 2010 gives you the ability to analyze and work with an enormous amount of data. To most effectively use this data, you may need to manipulate this data in different ways. Sometimes you may find that you need to reorder or sort that information to be able to use it most effectively.

*Sorting or Data Sorting* is a common spreadsheet task that allows you to easily reorder your data. The most common type of sorting is alphabetical ordering, which you can do in ascending or descending order.

### To Sort in Alphabetical Order:

- Select a cell in the column you want to sort (In **Figure 5.99**, we choose a cell in column A).



	A	B
1	Amit	
2	Rahul	
3	Rajan	
4	Dharam	
5	Paras	
6	Punit	
7	Priyanka	
8	Raman	

Fig. 5.99 (Sorting: Select a Cell from the Column)

- Click the **Sort & Filter** command in the **Editing** group on the **Home tab**. Select **Sort A to Z**.

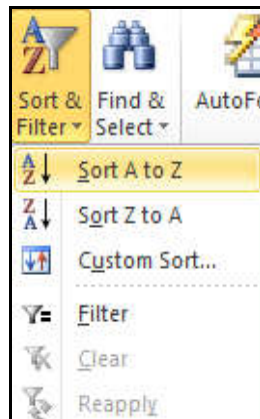
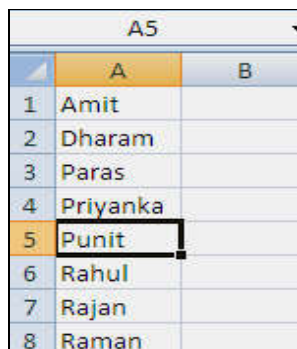


Fig. 5.100 (Sort & Filter: Sort A to Z)

- Now, the data in the spreadsheet will be organized alphabetically.



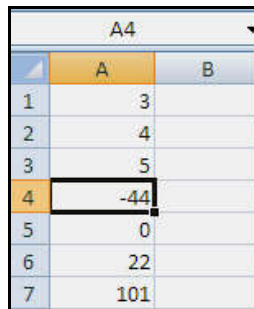
	A	B
1	Amit	
2	Dharam	
3	Paras	
4	Priyanka	
5	Punit	
6	Rahul	
7	Rajan	
8	Raman	

Fig. 5.101 (Sorted List)

**Note:** You can sort in **reverse alphabetical order** by choosing **Sort Z to A** in the list.

### To Sort in Numerical Order:

- Select a cell in the column you want to sort (a column with numbers).



	A	B
1	3	
2	4	
3	5	
4	-44	
5	0	
6	22	
7	101	

Fig. 5.102 (Sorting: Select a Cell from the Column)

- Click the **Sort & Filter** command in the **Editing** group on the **Home** tab. Select **Sort Smallest to Largest**.

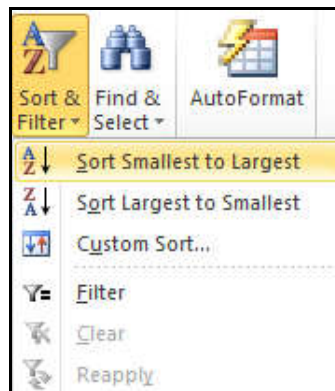
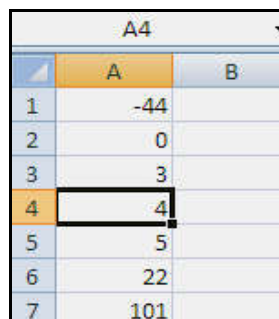


Fig. 5.103 (Sorting: Sort Smallest to Largest)

- Now, the data in the spreadsheet will be organized numerically from the smallest to largest value.



	A	B
1	-44	
2	0	
3	3	
4	4	
5	5	
6	22	
7	101	

Fig. 5.104 (Sorted List)

**Note:** You can sort in **reverse numerical order** by choosing **Sort Largest to Smallest** in the list.

**To Sort by Date or Time:**

- Select a cell in the column you want to sort.

	A	B	C	D
1	Name	Class	Roll No.	Admission Date
2	Mohit	BCA	A101	11-Mar-18
3	Rahul	BBA	B201	07-Mar-18
4	Amit	MCA	M301	01-Mar-18
5	Prince	MBA	C101	15-Mar-18

Fig. 5.105 (Sorting: Select a Cell from the Column)

- Click the **Sort & Filter** command in the **Editing** group on the **Home** tab. Select **Sort Oldest to Newest**.

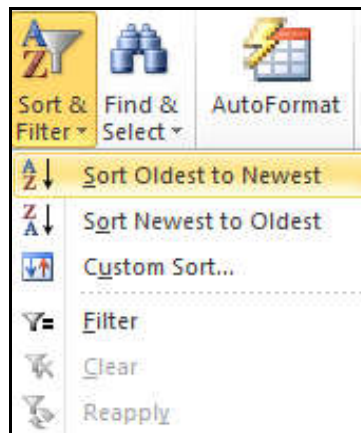


Fig. 5.106 (Sorting: Sort Oldest to Newest)

- Now, the data in the spreadsheet will be organized by date or time.

	A	B	C	D
1	Name	Class	Roll No.	Admission Date
2	Amit	MCA	M301	01-Mar-18
3	Rahul	BBA	B201	07-Mar-18
4	Mohit	BCA	A101	11-Mar-18
5	Prince	MBA	C101	15-Mar-18

Fig. 5.107 (Sorted List)

**Note:** You can sort in **reverse Date or Time order** by choosing **Sort Newest to Oldest** in the list.

## 5.24 FILTERING

Filtering is a convenient and reliable way to locate and manage spreadsheet data. This allows you to focus on specific spreadsheet entries. Filtered data can be copied, manipulated, and printed without having to move it to a new spreadsheet.

*Data filtering* in *Excel* enables the user to work with a subset of data within the data list. When a filter is created, only the records that contain the values specified are displayed. Other records in the data list are hidden temporarily.

Unlike sorting, filtering does not rearrange a list. Filtering temporarily hides rows you do not want displayed.

### Filtering in Excel:

In Excel 2010, filtering, or temporarily hiding data in a spreadsheet is very easy. You can filter data using the *AutoFilter* feature in Excel 2010 to display only the data that meets specified criteria.

#### To Filter Data:

- Open the spreadsheet in which you want to filter data.

	A	B	C	D	E	F
1	Last	First	Day	Worker	Amount	Hours
2	Goel	Amit	Monday	Staff	250	22
3	Kumar	Prem	Monday	Student	400	32
4	Sharma	Puneet	Wednesday	Staff	340	23
5	Singh	Gerry	Wednesday	Student	530	25
6	Mittal	Arvind	Thursday	Volunteer	400	30
7	Verma	Anita	Thursday	Student	300	34
8	Devgan	Vipin	Friday	Staff	550	40
9	Kapoor	Anil	Saturday	Volunteer	500	35
10	Babbar	Raj	Saturday	Volunteer	660	20

Fig. 5.108 (Filtering: Spreadsheet for Filtering)

- *Prepare your data for an Excel 2010 AutoFilter:* Excel can filter the data in all selected cells within a range, as long as there are no completely blank rows or columns within the selected range. Once a blank row or column is encountered, filtering stops. If the data in the range you wish to filter is separated by blank rows or columns, remove them before proceeding with the AutoFilter.
- Conversely, if there is data on the worksheet that you do not want to be part of the filtered data, separate that data using one or more blank rows or blank columns. If



the data you don't want to filter is located beneath the data to be filtered, use at least one completely blank row to end filtering. If the data you don't want to filter is located to the right of data to be filtered, use a completely blank column.

- Select any cell within the range that you would like to filter.

	A	B	C	D	E	F
1	Last	First	Day	Worker	Amount	Hours
2	Goel	Amit	Monday	Staff	250	22
3	Kumar	Prem	Monday	Student	400	32
4	Sharma	Puneet	Wednesday	Staff	340	23
5	Singh	Gerry	Wednesday	Student	530	25
6	Mittal	Arvind	Thursday	Volunteer	400	30
7	Verma	Anita	Thursday	Student	300	34
8	Devgan	Vipin	Friday	Staff	550	40
9	Kapoor	Anil	Saturday	Volunteer	500	35
10	Babbar	Raj	Saturday	Volunteer	660	20

Fig. 5.109 (Filtering: Select any Cell within the Range for Filtering)

- Select **Filter** command in **Sort & Filter** group under **Data** tab.

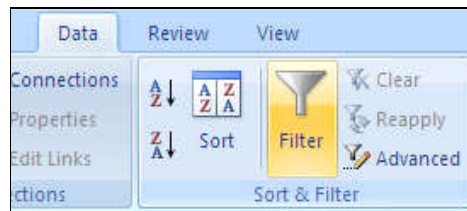


Fig. 5.110 (Filter Command)

- Drop-down arrows will appear at the top of each column range. If the range of cells contains column headings, the drop-down arrows will appear in the headings.

	A	B	C	D	E	F
1	Last	First	Day	Worker	Amount	Hours
2	Goel	Amit	Monday	Staff	250	22
3	Kumar	Prem	Monday	Student	400	32
4	Sharma	Puneet	Wednesday	Staff	340	23
5	Singh	Gerry	Wednesday	Student	530	25
6	Mittal	Arvind	Thursday	Volunteer	400	30
7	Verma	Anita	Thursday	Student	300	34
8	Devgan	Vipin	Friday	Staff	550	40
9	Kapoor	Anil	Saturday	Volunteer	500	35
10	Babbar	Raj	Saturday	Volunteer	660	20

Fig. 5.111 (Filtering: Drop-down arrows at the top of each column)

- Click the drop-down arrow of the column containing the desired criteria to be filtered. Do the following tasks:
  - To filter the data by criteria, click to clear the “(Select All)” check box. All other check boxes will be cleared. Click to select the check boxes of the criteria that you want to appear in the filtered list.

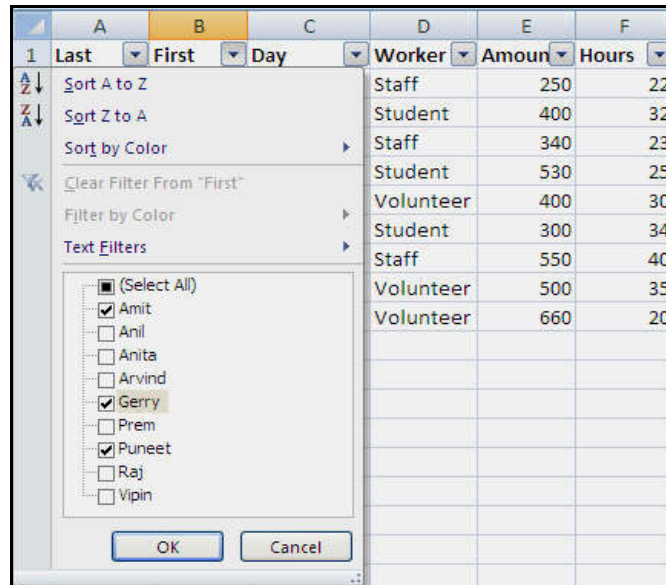


Fig. 5.112 (Filtering: Filter Data by Criteria)

- Click "OK" to filter the range by the selected criteria. The filtered result will be look like this:

	A	B	C	D	E	F
1	Last	First	Day	Worker	Amount	Hours
2	Goel	Amit		1 Staff	250	22
4	Sharma	Puneet		3 Staff	340	23
5	Singh	Gerry		3 Student	530	25

Fig. 5.113 (Filtering: Filtered Data)

## 5.25 PROTECTING WORKSHEETS

Protecting worksheets in Excel can help safeguard your data and prevent unauthorized changes.

### To Protect a Worksheet:

- Open the workbook containing the worksheet you want to protect.

- **Select the worksheet:** Click on the worksheet tab to select the specific worksheet you want to protect. If you want to protect multiple worksheets, hold down the **Ctrl** key while selecting multiple tabs.
- In the **Excel ribbon** at the top of the window, click on the "**Review**" tab.
- In the "**Changes**" group, click on the "**Protect Sheet**" button.

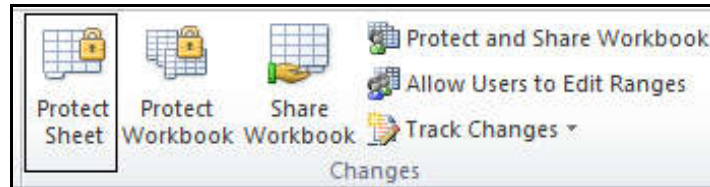


Fig. 5.114 (Protect Sheet)

- **Protect Sheet dialog box** will appear.

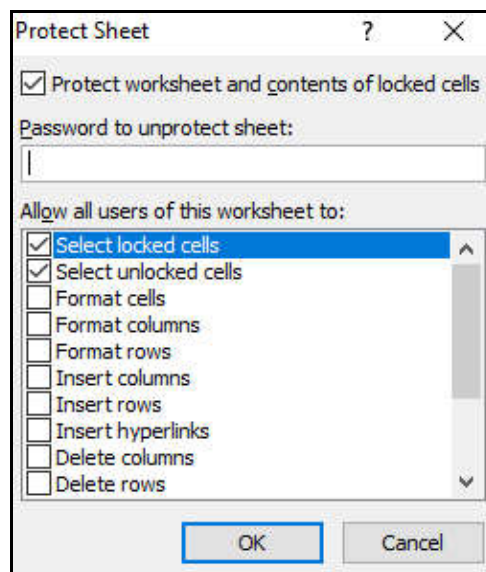


Fig. 5.115 (Protect Sheet Dialog Box)

- In the "**Protect Sheet**" dialog box, you can choose various protection options, such as allowing or disallowing certain actions like- *selecting cells, formatting cells, inserting or deleting rows/columns*, etc. You can also set a **password** to prevent others from unprotecting the sheet without the password.
- After configuring the desired protection options, click the "**OK**" button. The selected worksheet(s) will be protected.

## 5.26 CONTROLLING WORKSHEETS VIEWS

Controlling worksheet views in Excel allows you to customize the appearance and settings of specific worksheets within a workbook. This can be helpful for organizing and presenting data in a clear and concise way.

There are several ways to control worksheet views in Excel. Here are a few of the most common methods:

### 5.26.1 Hiding and Unhiding Rows and Columns

You can hide rows and columns to temporarily remove them from view.

#### To Hide a Row/Column:

- To hide a row or a column in a worksheet, **click** a row or column heading to select it.
- Then, **right-click** within the row or column and select *Hide* from the *shortcut menu* that appears.

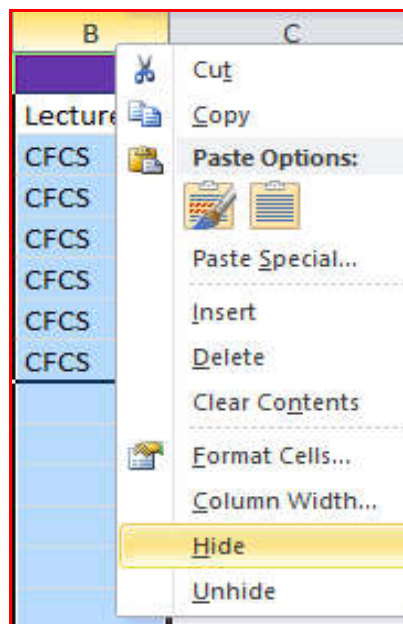


Fig. 5.116 (Hiding Row / Column)

#### To Display a Hidden Row/Column:

- To unhide the row or column, **right-click** the border between the hidden item and rows or columns that are visible.

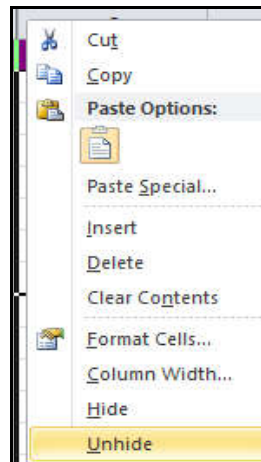


Fig. 5.117 (Unhiding Row / Column)

- Select **Unhide** from the *shortcut menu*.

### 5.26.2 Freezing Rows and Columns

When you are working with a lot of data, it can be difficult to compare one or more rows with others that are towards the bottom of the workbook. Excel's freeze panes feature solves this problem by letting you lock specific rows or columns so they are always visible when you scroll.

To keep *row* and *column labels* or other data visible as you scroll through a sheet, you can *freeze* the rows and/or columns. The frozen rows and columns don't scroll but remain visible as you move through the rest of the worksheet.

#### To Freeze Row(s):

- Select the row right below the row or rows you want to freeze. For example, if you want *row 1* to always appear at the top of the worksheet even as you scroll, then select *row 2*.

	A	B	C
1	Name	Class	Roll Number
2	Aman	BCA	3232
3	Rahul	BBA	4322
4	Amit	BBA	4344
5	Paras	BCA	3239
6	Nitin	BA	7675
7	Rajiv	BA	7678
8	Jatin	BCA	3235
9	Sunny	BSC	9898
10	Tarun	BCOM	8787

Fig. 5.118 (Freeze Row(s))

- Click the **View** tab → **Windows** group → **Freeze Panes** command. A **drop-down menu** appears. Select **Freeze Panes**.

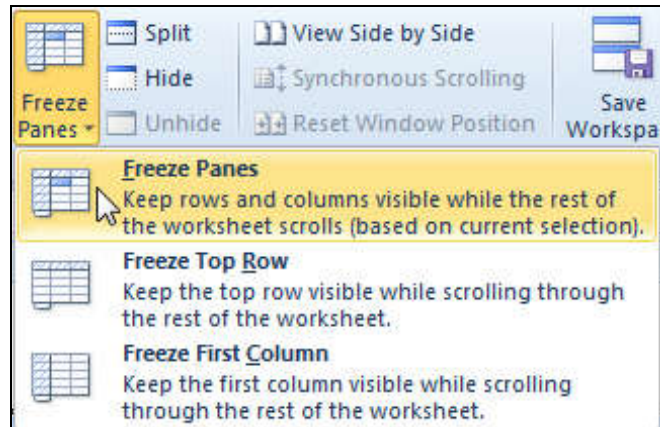


Fig. 5.119 (Freeze Panes Command)

- A **black line** appears *below* the row that is frozen in place. Scroll down in the worksheet to see the rows below the frozen rows.

	A	B	C
1	<b>Name</b>	<b>Class</b>	<b>Roll Number</b>
8	Jatin	BCA	3235
9	Sunny	BSC	9898
10	Tarun	BCOM	8787
11	Raj	BCA	3232
12	Raman	BSC	5655
13	Micheal	BCOM	7673
14	Charan	BA	7667
15	Puneet	BA	8789
16	Rohit	BBA	2121
17	Manu	BBA	1122
18	John	BCA	3311
19	Tonny	BSC	3533
20	Alexander	BCOM	4331

Fig. 5.120 (Worksheet Window with Row 1 Frozen)

### To Freeze Column(s):

- Select the column to the right of the columns you want frozen. For example, if you want *column A* to always appear to the left of the worksheet even as you scroll, select *column B*.

	A	B	C
1	Name	Class	Roll Number
8	Jatin	BCA	3235
9	Sunny	BSC	9898
10	Tarun	BCOM	8787
11	Raj	BCA	3232
12	Raman	BSC	5655
13	Micheal	BCOM	7673
14	Charan	BA	7667
15	Puneet	BA	8789
16	Rohit	BBA	2121
17	Manu	BBA	1122
18	John	BCA	3311
19	Tonny	BSC	3533
20	Alexender	BCOM	4331

Fig. 5.121 (Freeze Column(s))

- Click the **View** tab → **Windows** group → **Freeze Panes** command. A drop-down menu appears. Select **Freeze Panes**.

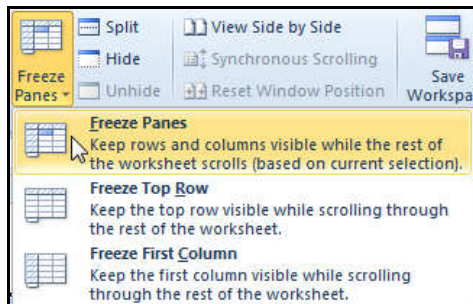


Fig. 5.122 (Freeze Panes Command)

- A **black line** appears to the *right* of the frozen area. Scroll across the worksheet to see the columns to the right of the frozen columns.

	A	C	D	E
1	Name	Roll Number		
2	Aman	3232		
3	Rahul	4322		
4	Amit	4344		
5	Paras	3239		
6	Nitin	7675		
7	Rajiv	7678		
8	Jatin	3235		
9	Sunny	9898		
10	Tarun	8787		
11	Raj	3232		
12	Raman	5655		
13	Micheal	7673		
14	Charan	7667		

Fig. 5.123 (Worksheet Window with Column A Frozen)

**To Unfreeze Panes:**

- Click the **View** tab → **Windows** group → **Freeze Panes** command. A drop-down menu appears. Select **Unfreeze Panes**.

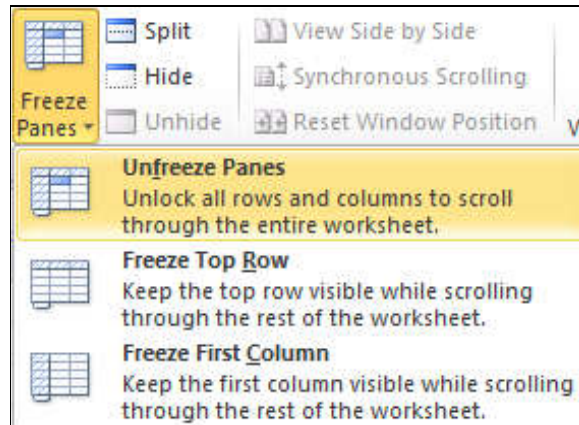


Fig. 5.124 (Unfreeze Panes)

**5.26.3 SPLITTING SCREEN**

Microsoft Excel allows you to split the worksheet window into separate panes on the same worksheet. This allows you to work on different areas of a spreadsheet without having to scroll between them. You can split the screen horizontally, vertically or both for up to four different panes.

*Split Box* is used to split the screen vertically and/or horizontally into sections allowing you to see multiple copies of a worksheet.

Use the *Split Box* located at the top of the vertical scroll bar (*horizontal split*) or the far right end of the horizontal scroll bar (*vertical split*) to divide the screen into two parts.

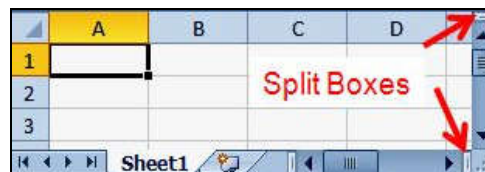


Fig. 5.125 (Split Boxes)

**Note:** Splitting the screen is an alternative to *freeze panes* to keep worksheet titles or headings on screen as you scroll.

**To Split a Worksheet into two Horizontal Panes:**

- Place the mouse pointer over the split box above the vertical scroll bar.



- The mouse pointer will change to a **double-headed black arrow** when you are over the split box. (Fig. 5.126)

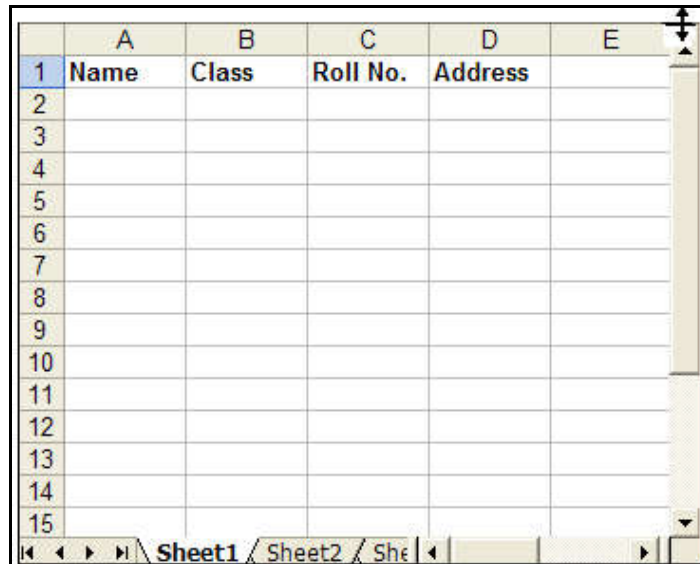


Fig. 5.126 (Mouse pointer over Split Box)

- When the mouse pointer changes, **click** and **hold down** the left mouse button.
- A *dark horizontal line* will appear above row one of the worksheets.
- Drag the mouse pointer downward. The dark horizontal line will follow the mouse pointer. (Fig. 5.127)

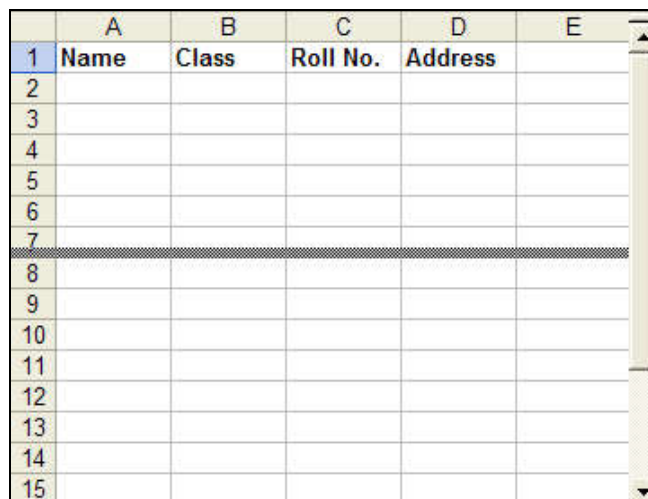


Fig. 5.127 (Dark Horizontal line follows the Mouse Pointer)

- Release the mouse button and the screen will be split into two views, each with its own vertical scroll bar.
- Now, above and below the horizontal split bar, there will be two copies of the worksheet. (Fig. 5.128)

	A	B	C	D	E
1	Name	Class	Roll No.	Address	
2					
3					
4					
5					
6					
7					
1	Name	Class	Roll No.	Address	
2					
3					
4					
5					
6					
7					
8					

Fig. 5.128 (Horizontal Split Bar)

#### To Split a Worksheet into two Vertical Panes:

- Place the mouse pointer over the split box to the right of the horizontal scroll bar.
- The mouse pointer will change to a double-headed black arrow when you are over the split box. (Fig. 5.129)

	A	B	C	D
1	Name	Class	Roll No.	Address
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Fig. 5.129 (Mouse pointer over Split Box)

- When the mouse pointer changes, click and hold down the left mouse button.

- A dark vertical line will appear, running up the page. Drag the mouse to the left and this line will follow. (Fig. 5.130)

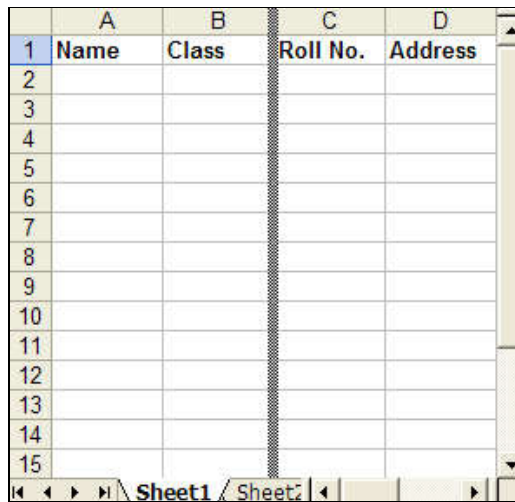


Fig. 5.130 (Dark Vertical line follows the Mouse Pointer)

- Release the mouse button and the screen will be split into two views, each with its own horizontal scroll bar.
- Now, before and after the vertical split bar, there will be two copies of the worksheet. (Fig. 5.131)

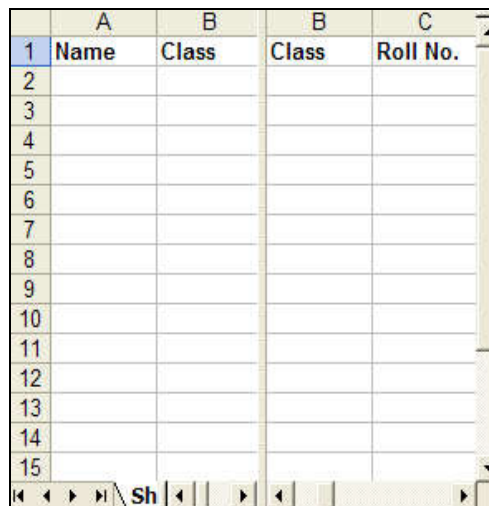


Fig. 5.131 (Vertical Split Bar)

**Note:** To restore a window that has been split into two scrollable areas, double-click any part of the split bar that divides the panes.

## 5.27 NAMING CELLS AND CELL RANGES

By assigning meaningful names to cells or ranges, you can make it easier to understand and reference them in formulas and calculations. Additionally, named ranges can be used to create dynamic charts and tables that automatically update when the underlying data changes.

### Naming Cells:

To name a cell in Excel, follow these steps:

1. Select the cell you want to name.
2. Click on the Name box located to the left of the formula bar.
3. Enter a descriptive name for the cell.
4. Press Enter to save the name.

### Naming Cell Ranges:

To name a range of cells in Excel, follow these steps:

1. Select the range of cells you want to name.
2. **Click** on the **Name box** located to the left of the formula bar.
3. Enter a descriptive name for the range.
4. Press *Enter* to save the name.

### 5.27.1 Benefits of Naming Cells and Cell Ranges

Here are some of the benefits of naming cells and cell ranges in Excel:

- **Improved readability:** Named cells and ranges make your spreadsheets easier to read and understand.
- **Easier to reference:** You can use named cells and ranges in formulas instead of cell references, which makes your formulas more readable and easier to maintain.
- **Dynamic charts and tables:** You can use named ranges to create dynamic charts and tables that automatically update when the underlying data changes.
- **Error prevention:** Named cells and ranges can help to prevent errors by making it less likely that you will enter an incorrect cell reference in a formula.

### 5.27.2 Working with Cell Ranges

A *cell* is a single element in a worksheet that can hold a value, some text, or a formula. A cell is identified by its address, which consists of its *column letter* and *row number*. For example, cell E9 is the cell in the fifth column and the ninth row.

A range is a group or block of cells in a worksheet that have been selected or highlighted. When cells have been selected, they are surrounded by an *outline* or *border*.

Normally there is only one cell in the worksheet with a black outline. This is the *Active cell*. Whatever command is executed by *Excel* affects the active cell.

	A	B	C	D	E	F
1						
2						
3						
4						
5						
6						

Fig. 5.132 (Active Cell)

Using the mouse, keyboard or Name Box, more than one cell can be selected to create a range, and commands executed by Excel will affect the entire range.

Ranges can be made up of *adjacent* or *non-adjacent* cells. Adjacent cells are all together. There are no gaps in the range. Non-adjacent cell ranges consist of two or more separate blocks of cells. These blocks can be separated by rows or columns. For non-adjacent ranges, a block of cells can be of any size – from one to several hundred or even a thousand or more.

A range consisting of *adjacent cells* can be created by dragging with the mouse. A range of adjacent cells as seen in the Fig. 5.133 would be **B1:B9**.

	A	B	C	D	E
1		4			
2		5			
3		6			
4		7			
5		9			
6		2			
7		1			
8		8			
9		4			
10		=sum(B1:B9)			

The Range for the SUM function is B1 to B9.

Fig. 5.133 (Range of Adjacent Cells)

Ranges consisting of *non-adjacent cells* can be created by using the mouse and keyboard.

### To Create a Range consisting of non-adjacent cells:

- **Click** on the first cell you want to select with the mouse pointer to make it the active cell.
- Release the mouse button.
- **Press and hold** down the **Ctrl** key on the keyboard.
- **Click** on the rest of the cells you want to select them without releasing the **Ctrl** key.
- Once all the desired cells are selected, release the **Ctrl** key.
- Do not click anywhere else with the mouse pointer once you release the **Ctrl** key or you will clear the highlight from the selected cells.
- If you release the **Ctrl** key too soon and wish to highlight more cells, simply press and hold down the **Ctrl** key again and then click on the additional cell(s).

	A	B	C
1			
2	2	77	7
3	3	5	7
4	54	5	34
5	6	65	5
6	78	7	6
7	98	78	7
8	90	89	6
9			

Fig. 5.134 (Range of Non-adjacent Cells)

Ranges are identified by the cell references or addresses of the cells in the upper left and lower right corners of the range. These two references are separated by a colon (:) which tells Excel to include all the cells between these start and end points.

## QUESTIONS

### Short Answer Questions

Q1. What is Spreadsheet

Or

Define Worksheet.

**Ans:** *Spreadsheet or Worksheet* is a document that stores data in a grid of horizontal rows and vertical columns. Rows are typically labeled using numbers (1, 2, 3, etc.), while columns are labeled with letters (A, B, C, etc). Individual row/column locations, such as C3 or B12, are referred to as *cells*.

In a spreadsheet application, each value sits in a cell. You can define what type of data is in each cell and how different cells depend on one another.

**Q2. Define Spreadsheet Software.**

**Ans:** Spreadsheet software allows users to perform calculations on the data. These are computer programs that allow the user to create and manipulate spreadsheets electronically. Microsoft Excel is spreadsheet software in the *Microsoft Office Suite* widely used to perform mathematical calculations. The data is spread in a tabular form consisting of rows and columns. It provides built-in features and tools such as formulas, functions and data analysis tools that make it easier to work with large amount of data.

**Q3. Briefly explain worksheet, workbook and cell.**

**Ans:** A **worksheet** is the grid of cells where you can type the data. The grid divides your worksheet into rows and columns. *Columns* are identified with letters (A, B, C ...), while *rows* are identified with numbers (1, 2, 3 ...).

The worksheets in turn are grouped together into a **workbook**. By default each workbook in Excel contains 3 blank worksheets, which are identified by tabs (sheet1, sheet2 and sheet3) displaying along the bottom of your screen.

**Cells** are the basic building blocks of a worksheet. Each rectangle in a worksheet is called a **cell**. A cell is the intersection of a **row** and a **column** i.e. a cell is identified by column and row. Each cell has a **name**, or a **cell address** based on which column and row it intersects.

**Q4. What are the features of MS-Excel?**

**Ans:** MS-Excel helps us to:

- Arrange data in an organized way
- Perform mathematical calculations
- Compare data through charts
- Sort data for better analysis
- Compare two workbooks side by side

**Q5. What is Range in MS-Excel?**

**Ans:** A range is a group or block of cells in a worksheet that have been selected or highlighted. When cells have been selected they are surrounded by an *outline* or *border*.

Normally there is only one cell in the worksheet with a black outline. This is the *Active cell*. Whatever command is executed by *Excel* affects the active cell.

	A	B	C	D	E	F
1						
2						
3						
4						
5						
6						

(Active Cell)

Using the mouse, keyboard or Name Box, more than one cell can be selected to create a range, and commands executed by Excel will affect the entire range.

Ranges can be made up of *adjacent* or *non-adjacent* cells. Adjacent cells are all together.

There are no gaps in the range. Non-adjacent cell ranges consist of two or more separate blocks of cells. These blocks can be separated by rows or columns.

**Q6. Define Formulas in Excel.**

**Ans:** *Formulas* are equations that perform calculations on data values in the worksheet. Like a calculator, Excel can execute formulas that add, subtract, multiply, and divide. A formula can be a combination of constant values, cell references and mathematical operators (+, -, /, \*, =). A formula starts with an equal sign (=).

**Example:**

The following formula multiplies 5 by 10 and then adds the value in cell A2 to the result:

=A2+5\*10

**Q7. Write a note on Chart.**

**Ans:** *Charts (also known as graphs)* are a visual representation of data in a worksheet. *Charts* allow you to present data entered into the worksheet in a visual format using a variety of graph types. Charts make it easy to see comparisons, patterns, and trends in data.

Before to create a chart, you must have some numeric data values stored in the cells of a worksheet. Normally, the data that a chart uses can reside in a single worksheet, or in multiple worksheets.

**Q8. How data filter helps to manage and locate spreadsheet data effectively?**

**Ans:** Filtering is a convenient and reliable way to locate and manage spreadsheet data. This allows you to focus on specific spreadsheet entries. Filtered data can be copied, manipulated, and printed without having to move it to a new spreadsheet.

*Data filtering in Excel* enables the user to work with a subset of data within the data list. When a filter is created, only the records that contain the values specified are displayed. Other records in the data list are hidden temporarily.

Unlike sorting, filtering does not rearrange a list. Filtering temporarily hides rows you do not want displayed.

**Q9. What is Embedded Chart?**

**Ans:** Embedded charts are charts that reside in the same worksheet as the source data i.e. if a chart resides in a worksheet along with worksheet data, then that kind of chart is called an *embedded chart*.

**Q10. Write about Fill Tool and Fill Series.**

**Ans:** Fill tool is a way to duplicate existing content. It basically helps you fill in sequential data without having to type in every cell.

A more complex use of the Fill Tool is to use a Fill Series. The default lists are for the full and abbreviated days of the week and the months of the year, but you can create your own lists as well.

**Q11. Discuss menus and toolbars in Excel 2010.**

**Ans:** In Excel 2010, *menus* and *toolbars* have been replaced by the *tabbed Ribbon system*. Ribbon is a combination of *menu bar* and *tool bar*. The Ribbon is designed to help you quickly find the commands that you need to complete a task. Commands are organized in logical groups, which are collected together under *tabs*.

**Q12. What is Payroll Statement?**

**Ans:** Payroll is the sum total of all compensation a business must pay to its employees for a set



period of time or on a given date. It is usually managed by the accounting department of a business; small-business payrolls may be handled directly by the owner or an associate.

**Q13. Explain Lookup function.**

*Or*

**Discuss the uses of lookup and reference function in spreadsheet.**

**Ans:** Refer section 5.17.7

**Q14. Write steps for inserting and removing page breaks in MS-Excel.**

**Ans: To Insert a Page Break:**

- Move the cursor to the row where a page break needs to be inserted. This row will be the first row on the new page.
- Click the **Page Layout** tab → **Page Setup** group → **Breaks** command → **Insert Page Break** option.
- A page break, indicated by a dashed line, is inserted into the worksheet.
- You can go to **Print Preview** to confirm that it appears in the correct place on the page.

**To Remove a Page Break:**

- Move the cursor to the row where a page break appears.
- Click the **Page Layout** tab → **Page Setup** group → **Breaks** command → **Remove Page Break** option.
- The page break (represented by a dashed line) is removed from the page.

### **Long Answer Questions**

**Q1. What is Spreadsheet? Explain the main features of MS-Excel.**

*Or*

**What is Spreadsheet? Explain the main features of a spreadsheet package.**

**Ans:** Refer section 5.1 & 5.1.1

**Q2. What is Spreadsheet? Explain different kinds of mathematical and statistical functions with example.**

**Ans:** Refer Section 5.1, 5.17.1 & 5.17.2

**Q3. What are different categories of Charts? Write the steps to create a chart in MS-Excel.**

**Ans:** Refer section 5.22.1.2 & 5.22.1.3.1

**Q4. Define Cell Referencing. Explain relative, mixed and absolute cell referencing with example.**

**Ans:** Refer Section 5.16

**Q5. How functions make tasks easy in Excel? Explain different kinds of mathematical and statistical functions with example.**

**Ans:** Refer Section 5.17, 5.17.1 & 5.17.2

**Q6. Discuss the mathematical formulae of SUM, SUBTOTAL, PRODUCT, and AVERAGE in a spreadsheet in detail.**

**Ans:** Refer Section 5.17.1