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What is MS-Excel

MS Excel is an Electronic Spreadsheet present in Microsoft Office application. It is a spreadsheet program which is used to save and analyses numerical data. In MS Excel one can record data in the form of tables. Unlike a word processor, such as Microsoft Word, Excel organizes data in columns and rows. Rows and columns intersect at a space called a cell. Each cell contains data, such as text, a numerical value, or a formula. Collection of cells is known as Range. We can open excel in the run software by typing this command “excel”.

In MS Excel, The document in which work is known as a sheet. By default we have 3 sheets in excel and can add more at any time. The collections of these sheets are known as workbook or worksheets.

In excel, we have a total of **16384** columns and **1048576** rows. The columns are named alphabetically and start from A and ends at XFD. While as rows are numerically named starting from 1 and ending at 1048576. The intersection or meeting point of rows & columns, known as cells are named alpha-numerically. They contain both the names of their rows and columns. First they have the name of their column and then the row e.g. A1, B2… XFD1048576 ETC. This is also known as cell addressing. The cell address is the name by which is cell can be addressed. For example, if row 7 is interested in column G, then the cell address is G7.

The default name of the file made in MS excel is called book1. MS Excel has 7 tabs/menu which contains all the tools and options which we can use. They are known as: Home tab, Insert tab, Page Layout, Formula Tab, Data Tab, Review Tab, View Tab. We can zoom up to 500% maximum,10%minimun and 100% default in MS Excel.

Features of MS Excel

Various editing and formatting can be done on an Excel spreadsheet. The various features of MS Excel are as below.

1. **Home**

Comprises options like font size, font styles, font colour, background colour, alignment, formatting options and styles, insertion and deletion of cells and editing options

2. **Insert**

Comprises options like table format and style, inserting images and figures, adding graphs, charts and sparklines, header and footer option, equation and symbols

3. **Page Layout**

Themes, orientation and page setup options are available under the page layout option

4. **Formulas**

Since tables with a large amount of data can be created in MS excel, under this feature, you can add formulas to your table and get quicker solutions

5. **Data**

Adding external data (from the web), filtering options and data tools are available under this category

6. **Review**

Proofreading can be done for an excel sheet (like spell check) in the review category and a reader can add comments in this part

7. **View**

Different views in which we want the spreadsheet to be displayed can be edited here. Options to zoom in and out and pane arrangement are available under this category.

Benefits of Using MS Excel

MS Excel is widely used for various purposes because the data is easy to save, and information can be added and removed without any discomfort and less hard work.

Given below are a few important benefits of using MS Excel:

Easy To Store Data: Since there is no limit to the amount of information that can be saved in a spreadsheet, MS Excel is widelyused to save data or to analyse data. Filtering information in Excel is easy and convenient.

Easy To Recover Data: If the information is written on a piece of paper, finding it may take longer, however, this is not the case with excel spreadsheets. Finding and recovering data is easy.

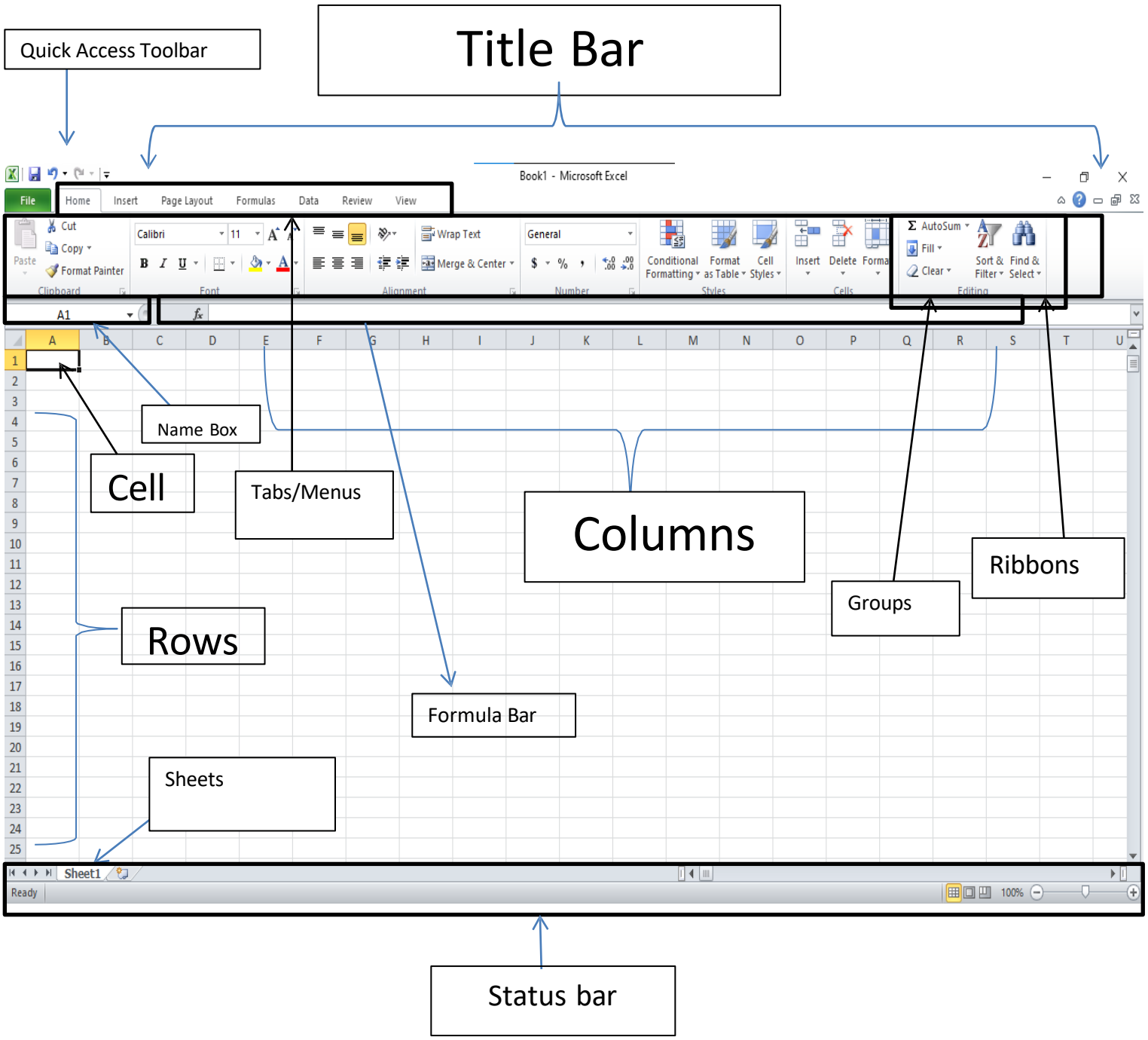
Application of Mathematical Formulas: Doing calculations has become easier and less time -taking with the formulas option in MS excel

More Secure: These spreadsheets can be password secured in a laptop or personal computer and the probability of losing them is way lesser in comparison to data written in registers or piece of paper.

Data at One Place: Earlier, data was to be kept in different files and registers when the paperwork was done. Now, this has become convenient as more than one worksheet can be added in a single MS Excel file.

Neater and Clearer Visibility of Information: When the data is saved in the form of a table, analysing it becomes easier. Thus, information is a spreadsheet that is more readable and understandable.

Structure of MS-Excel



Functions and Formulas

An Excel formula is an expression that acts on a cell or range of cells and produces results in another cell or multiple cells. You can create a simple formula to add, subtract, multiply, or divide values in your worksheet. Simple formulas always start with an equal sign (**=**), followed by constants that are numeric values and calculation operators such as plus (**+**), minus (**-**), asterisk(*****), or forward slash (**/**) signs.

Basic Syntax of a formula:

= argument1 operator argument2 (enter)

e.g. =1+1 . =2

arguments can be cell or values

While as Functions are Pre-defined formulas. They have formulas already defined in themselves. In a function, we don't need to repeat our operator, we only have to add our arguments in our function to get result.

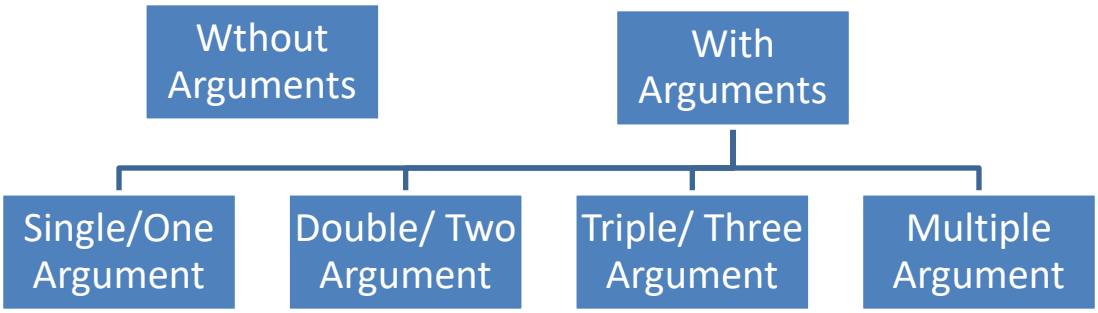
Basic Syntax of a Function:

= Function name(argument1 , argument 2 , argument 3 .....) (enter)

e.g. =sum(1,2,3) . =6

Categories of Functions

In Excel, There are total 2 categories of Functions:



1. **Function without arguments**: those functions are which are used without having any arguments in it .
   Syntax:
   =function-name ()
   e.g.: =now (), =today () etc.

2. **Function with arguments:** these functions need something to work with, that could be a value or cell. These functions have sub-categories

   a. **Function with single Argument:** They only use one argument. syntax: =function-name(arg1) e.g., =sqrt (), =fact ()

   b. **Function with double Argument:** They only have Two argument. syntax: =function-name (arg1, arg2) e.g., =left (), =mod ()

   c. **Function with triple Argument:** They use Three argument. syntax: =function-name (arg1, arg2, arg3) e.g., =mid ()

   d. **Function with Multiple Argument:** These functions can have a minimum of two argument and do not have any limit for their arguments. syntax: =function name (Range) -→ range means more than one cells. E.g., =sum(range), =product(range)

Types of Functions

Excel has a total of 4 functions in it.

1. Numeric functions:

These Functions uses number as their arguments

1. =SUM(Range) E.g.: =SUM(A1, A5, B5, C5, F5) or =SUM(A1:A10) Used to get the sum of cell values.
2. =PRODUCT(Range) E.g.: =PRODUCT(B1, 67, A4, 7) or =PRODUCT(A1:F1) Used to get the product of cell values.
3. =COUNT(Range) E.g.: =COUNT(A1, A5, A7, A10) or =COUNT(B1:B2) Counts the number of filled cells.
4. =COUNTBLANK(Range) E.g.: =COUNTBLANK(A1, A2, A3, A4) Counts the number of blank cells.
5. =MIN(Range) E.g.: =MIN(A2:M11) Returns the smallest cell value from the selected area.
6. =MAX(Range) E.g.: =MAX(A2, B2, A5) Returns the largest cell value from the selected range.
7. =AVERAGE(Range) E.g.: =AVERAGE(A1:A10) Returns the average value of selected cells.
8. =MOD(Number, Divisor) E.g.: =MOD(18, 3) Returns the remainder value.
9. =FACT(Number) E.g.: =FACT(15) Returns the factorial of a number.
10. =SQRT(Number) E.g.: =SQRT(18) Returns the square root of a number.

11. =ROUND(Number, DecimalPlaces) E.g.: =ROUND(2.43789, 0) Rounds a number to the specified decimal places.
12. =FLOOR(Number) E.g.: =FLOOR(2.99976391) Returns the floor value of a number.
13. =CEIL(Number) E.g.: =CEIL(2.143376) Returns the ceiling value of a number.
14. =COUNTIF(Range, Criteria) E.g.: =COUNTIF(A1:A20, "<=5") Counts the number of cells matching a given condition.
15. =COUNTA(Range) E.g.: =COUNTA(A1:A10) Counts the number of non-empty cells (including text).

2. Text functions

These formulas are implemented on text.

1. =LEFT(Text, NumChars) E.g.: =LEFT("Waseem Ahmed", 6) → Output: Waseem
2. =RIGHT(Text, NumChars) E.g.: =RIGHT("Beigh Waseem", 6) → Output: Waseem
3. =MID(Text, StartNum, NumChars) E.g.: =MID("Waseem Ah. Beigh", 5, 3) → Output: em
4. =LOWER(Text) E.g.: =LOWER(A1) Converts text to lowercase.
5. =UPPER(Text) E.g.: =UPPER(A1) Converts text to uppercase.
6. =FIND(FindText, WithinText, StartNum) E.g.: =FIND("Q", A5, 1) Finds the position of a character in text.
7. =REPLACE(OldText, StartNum, NumChars, NewText) E.g.: =REPLACE("Skyline Computer", 10, 9, "Institute") → Output: Skyline Institute
8. =LEN(Text) E.g.: =LEN("Beigh Waseem") Returns the length of text.

3. Day/time functions

These functions are used to get time and date.

1. =NOW() – Shows current date and time.
2. =TODAY() – Shows current date only.
3. =DAY(TODAY()) – Shows the day of the current date.
4. =YEAR(TODAY()) – Shows the year of the current date.
5. =MONTH(TODAY()) – Shows the month of the current date.
6. =HOUR(Time) – Shows the hour from a time value.
7. =MINUTE(Time) – Shows the minutes from a time value.
8. =SECOND(Time) – Shows the seconds from a time value.

4. Boolean Functions

These functions are used for comparisons.

1. IF FUNCTION: Syntax: =IF(Condition, ValueIfTrue, ValueIfFalse) E.g.: =IF(20>10, "Hello", "Hey") → Output: Hello
2. NESTED IF: =IF(Condition1, Value1, IF(Condition2, Value2, Value3))

Cell Addressing and Cell Referencing in MS Excel

Cell referencing in Excel (and other spreadsheet software) is the way you identify and refer to a specific cell or range of cells so that formulas and functions know where to get their data from.

Instead of hard-typing values into every formula, you use a **cell reference** — which points to the location of the data — so that if the data changes, the formula updates automatically.

Cell addressing is the way Microsoft Excel identifies the location of a cell in a worksheet. Each cell is given a unique **address** based on its **column letter** and **row number** — for example, `B3` means the cell in **column B** and **row 3**.

Types of Cell Addressing

1. **Absolute Reference :-**

   It refers to a specific cell or range of cells. It is useful when we want to refer to data in a fixed location, rather than allowing the reference to change based on the column or row. Example: If we want to calculate a percentage using a fixed value, we can make a column, row, or cell absolute by placing a dollar sign (`$`) before the column letter, the row number, or both.

2. **Relative Reference :-**

   It refers to a cell relative to the position of the formula. If we copy a formula that contains a relative cell reference, the reference will adjust automatically to the new location. Example: Given the contents in cell A1 and cell A2, type the formula in cell B1 and press Enter. Now, use the Copy-Paste option from the Edit menu or the AutoFill handle to copy the formula to cell B2. The formula in B2 will automatically adjust to refer to A2 instead of A1.

3. **MIXED REFERENCE:**

   A combination of absolute and relative references is called a mixed reference. Example: `$A1` (column fixed, row changes) or `A$1` (row fixed, column changes).