SPREADSHEET

Spreadsheet

A spreadsheet is a computer program that allows the user to store data in a grid of Rows and Columns. It is used to record, calculate and compare numerical or financial data.

There is a lot of Spreadsheet programs like LibreOffice Calc, MS Excel, Lotus 1-2-3 etc.

Basic Concepts of a Spreadsheet

Workbook – A file that contains one or more worksheets is called a workbook. In this we can enter, store and manipulate data.

Worksheet - A page in a workbook is called Worksheet which contains rows and columns. **Cell** - The intersection of rows and columns is called Cell. The cell which is clicked is known as **active cell**.

Cell Address – It is the unique identification of each cell. It is a combination of column name and row number. Eg: A1, B5 etc.

Rows – A row is the range of cells that go horizontally in a worksheet. Rows are identified by numbers like 1, 2, 3.

Columns – - A column is the range of cells that go vertically in a worksheet. Columns are identified by letters like A, B, C.

Adding, Deleting and Renaming Worksheets

To **add** a new worksheet, click on the 'Insert Worksheet button' available near to the sheet tab. A new blank worksheet will be created. Alternatively, you can right click on any sheet tab and select "Insert" from the menu. Pressing of 'Shift+F11' buttons also inserts a new sheet.

To **delete** an existing sheet, right click on the sheet tab of the desired sheet and select 'Delete' from the menu.

By default Calc sheets are named as 'Sheet1', 'Sheet2, etc. To change the name of a worksheet right click on a sheet tab, select "**rename**" and type in a new name followed by the Enter key.

Range - Range is a group of selected cells. Ranges are identified by the cell references of the cells in the upper left and lower right corners of the range. For example, the range D1:E10 includes a block of 20 cells starting from D1 and ending to E10.

Cell Reference – A cell reference identifies the location of a cell or group of cells, which is also called cell address. Eg: A1, C10 etc.

Relative Cell Reference - Normally, when a formula or function from one cell is copied to another, <u>the references given in the formula or function automatically changes to suit the new location</u>. For example in the cell C1, we have given a formula as '=A1+B1' to add values in A1 and B1. If we copy the formula to C2, the formula is converted as '=A2+B2 '. This type of reference is called Relative Reference.

Absolute Cell Reference - Unlike relative references, <u>absolute references do not change when copied to another location</u>. Eg. The formula =$A$1+$B$1 will not change its references if we copy the formula to any part of the worksheet.

Mixed Cell Reference - If we assign the constant reference either for column or for row, it is called Mixed Reference. E.g. The cell reference $A1, makes the column A constant, but the row 1 changes according to the new location. In the same way the reference A$1, makes the row constant, but the column reference relative.

Navigation through the Sheet

We locate any cell by use a mouse click on the desired cell. We can navigate to unseen portion of the screen by using Vertical and Horizontal Scroll Bars. Below is given the important Key Board Short Cuts to navigate around the sheet.

Action	Key Stroke
One cell down	Down arrow key or Enter Key
One cell up	Up arrow key
One cell left	Left arrow key or Shift + Tab
One cell right	Right arrow key or Tab
Go to cell A1	Ctrl + Home
Go to right bottom cell of a range	Ctrl + End
Go to beginning cell of a row (Column A)	Home Key
Go to one screen up	Page Up
Go to one screen down	Page down
Go to the last column of the sheet	Ctrl + Right arrow
Go to the last row of the sheet	Ctrl + Down arrow

Labels – In spreadsheet programs, <u>a label is any descriptive text placed in a cell</u>. It consists of Alphabets and Special Characters. Labels can't be used for mathematical operations. For example in an employee database the First Name, Middle Name, Last Name, Address etc can be labels, because these are not used for any mathematical operations.

Formula – Formulas are <u>self-defined instructions entered in cell for performing calculations</u>. Formula should begin with an '=' sign. After entering the formula in a cell, we can see only the result of the formula in the cell. To see the formula again, we have to double click on the cell or just click on the cell and see the formula bar on the top of the window.

Functions – A function is a <u>pre-set formula which can be written directly into a cell, to display an outcome</u>. Some examples are given below:

=Sum(A1:A5)   gives the total of the figures in the range

 =Average(A1:A5)   gives the average value of the figures in the range

  =Max(A1:A5)   gives the Maximum value from the figures in the range Components of a function

in spreadsheet

Initial Operator	Function Name	Arguments
=	Sum	(A1:A5)

Basic and Derived Values

If we directly enter a value or piece of data in a cell, it is called Basic Value. If the data in a cell is generated by an arithmetical expression or as the result of a function or formula, it is called derived value.

Eg. We entered Basic Salary in A1, DA in A2, HRA in A3 and the formula =A1+A2+A3 in the cell A4 to get Gross Salary. Here Cells A1, A2 and A3 has Basic Values, whereas, A4 has Derived Value.

Naming a Range – In spreadsheet, we can assign suitable names for the ranges and these names can be used instead of complicated range references in the formulas and functions.

Eg: Scores obtained by a commerce student in his subjects are given in the range C2:C7. To get the total scores in the cell C8, we have to give a formula in C8 as '= SUM(C2:C7)'. But it is difficult to remember this range reference. Hence we named the range as 'Marks'. Then we can use the formula in C8 as '=SUM(Marks)'.

Steps for Naming a Range

 a. Select the range of cells, that we want to assign name
 b. Click on 'Data' tab
 c. Select the 'Define Range' option
 d. Give name for the range
 e. Click on OK button
     Select the cells – Data – Define Range – Type Name - OK

Useful Functions in Spreadsheet
1. Date and Time Function
2. Mathematical Function
3. Text Manipulation Function
4. Logical Functions
5. Lookup and Reference Function
6. Financial Function

Date and Time Function

Spreadsheet takes 01/01/1900 as a base for calculating the dates. It assigns a serial number for each date taking 01/01/1900 as 1, 02/01/1900 as 2 etc.

Today - This function gives the current date in the cell.   **Synax: Today( )**

Now – It shows the current time along with date   **Synax: Now( )**

DATEVALUE(date_text) - This function converts the date into the corresponding value. In LibreOffice Calc 30/12/1899 has been set as the default date with the date value as zero (0). Thus January 1, 2000 has the value as 36526. Its syntax is **=Datevalue("date").** Eg: To find the date value of 15-05-2015, give the formula as =Datevalue("15/05/2015"). The result will be 42139.

Day(Serial_number) – This returns the day of a date ranging from 1 to 31

<div align="center">

Synax: Day(Serial no.)
</div>

Eg: 1. If we enter **=Day(42139)** in a cell, the result will be 15 as it is the 15th day of that month.
    2. If A1 = 23/07/2015, the **Day(A1**) will result in 23.

Month(Serial_number) – This function returns the serial number of the month. It ranges from 1 to 12. For example in the above case Month(A1) returns 7, i.e. the 7th month.

<div align="center">

Synax: Month(A1)
</div>

Year(Serial_number) – This function returns the serial number of the year. It ranges from 1900 to 9999. For example in the above case Year(A1) results in 2015. Ie; the 2015th year. **Syntax : Year(A1)**

Mathematical Function

SUM( ) – This function adds together a supplied set of numbers or numbers in a given range and returns the sum of these values.

Syntax: 1. =Sum(10,20,40)   2. =Sum(A1,A2,A3)   3. =Sum(A1:A3)

SUMIF( ) – This function adds all numbers in a range of cells, only if it meets the given criteria.
        Syntax: =Sumif(Range,Criteria,Sum_range)
                Range   = The range of cells in which the criteria is to be applied.
                Criteria   = The condition by which the cells to be added.
                Sum-range   = The actual cells to be added in the range.
E.g. 1.   =SUMIF(A1:A10,">50")   E.g.2.

=SUMIF(B2:B7,"Salesman",C2:C7)

This function will add the data in C2 to C7, only if the corresponding data in B2 to B7 is "Salesman".

	A	B	C
1	Name of Employee	Designation	Salary
2	Ajith	Manager	65000
3	Biji	Salesman	35000
4	~~Chandran~~	~~Manager~~	~~40000~~
5	~~Darvin~~	~~Salesman~~	~~18000~~
6	~~Eldo~~	~~Salesman~~	~~35000~~
7	Farhan	Manager	32000
8			
9	**Total Salary of Salesmen**		**88000**

ROUND( ) – This function rounds a number to a specified number of digits following normal rounding rules, i.e.; round down if the decimal portion is < 5, and round up if the decimal portion is ≥ 5.

> **Syntax : =Round(Number, count)**

Number = The number that we want to round.

Count = The number of digits to which we want to round the number.

Eg: =Round(210.5633,2) The result will be 210.56

Num_digits	-3	-2	-1	0	1	2	3
Rounds to	Nearest 1000	Nearest 100	Nearest 10	Nearest 1	1 Decimal	2 Decimal	3 Decimal
Examples	2795.285	1885.81	412.654	528.654	32.654	185.9214	5.1478
Result	3000	1900	410	529	32.7	185.92	5.148

ROUNDUP( ) – This function always round a number to upward, without considering the value next to the rounding digit.

Syntax: =Roundup**(**number, count**)**

Eg: 1. =Roundup(85.462,2) results in 85.47

2. =Roundup(85.462,0) results in 86

3. =Roundup(1430,-3) results in 2000

ROUNDDOWN( ) – This function always round a number to downward, without considering the value next to the rounding digit.

Syntax: =Rounddown(number,count)

Eg: 1. =Rounddown(85.462,2) results in 85.46

2. =Rounddown(85.462,0) results in 85

3. =Rounddown(1430,-3) results in 1000

COUNT( ) – This function will count cells that contain numbers or count the numbers given in the arguments separated by commas.

> **Syntax:** =Count **(**Value1, Value2, Value3…..**)**

Eg: 1. =Count(25,38,450,365,12) Results 5

2. =Count(A1:A10) gives the count of cells in the range A1 to A10, that contain numbers

COUNTA( ) – This function counts the number of cells that contain any type of data such as numbers, formula (with or without result), text etc. It doesn't count empty cells. Syntax: =Counta(Range of cells) Eg: =Counta(A1:E10)

COUNTBLANK( ) – This function counts the number of cells which are empty in a range. It is an opposite function of COUNTA. A cell that contains formula is not treated as empty, even if its result is empty.

      Syntax: =Countblank(Range of cells)   Eg: =Countblank(A1:E10)

COUNTIF( ) – This function is used to count the number of cells that meet a criteria. The criteria can be a number, expression, cell reference, or text string. For example, you can use a number like 32, a comparison like ">32", a cell like B44, or a word like "apples".

      Syntax: =Countif(Range,Criteria) Eg: =Countif(A1:A10,">=90")

Apply all the above Count functions based on the given table.

	A	B	C	D
1		105	APPLE LAPTOP	
2		FLOWER	70	MANGO	500
3		APPLE	45	
4		850	RED APPLE	

Rows(Range of cells) – This function counts the number of rows in an array or range.

      Syntax: =Rows(A1:F10)

Columns(Range of cells) – This function counts the number of columns in an array or range. **Syntax:** Columns(A1:F10)

Text Manipulation Function

Text( ) – This function converts a numeric value into text. It will be helpful to convert the numbers into more readable format.

      Syntax: =Text **(**value, format_text**)**

      Eg: 1. =Text(A1,"0.00") If A1 cell contains the value of 25, the result will be 25.00

CONCATENATE( ) – This function allows to join 2 or more strings together. The item can be a text value, number, or cell reference

      Syntax: **=Concatenate (text1, [text2], ...)**

Eg: = Concatenate("Good","Morning") give the result "GoodMorning"

Here there is no space between "Good" and "Morning". So in order to put a space we should use a space in quotes between these two texts.

So the formula = Concatenate("Good", " ", "Morning") gives the result "Good Morning"

Have a look on the following table and view the results of the formulas:

	A	B	C	Formula	Result
1	Today	Is	Holida	=Concatenate(A1," ", B1," ",C1)	Today is Holiday y
2	500	250		=Concatenate(A2,B2) 500250	
3	Mohan	Kumar	Mishra	=Concatenate(A3," ",B3," ",C3)	Mohan Kumar Mishra
				=Concatenate("My Total Mark is ",B2)	My Total Mark is 250

We can do the same function by using ampersand sign (&) instead of Concatenate function. Ie; '

      =A1&" "&B1&" "&C1 ' gives the result as "Today is Holiday"

Logical Functions

A logical function can return only one of two values: TRUE or FALSE

If - IF returns one value if the condition is true, and another value if the condition is false.

      Syntax: =IF(logical_test, value_if true, value_if_false)

        Logical test = The condition that is determined to be true or false

        Value if true = If the condition is true, this value will be returned

        Value if false = If the condition is false, this value will be returned

The operators in the logical_test of the IF function may be:

=	Equals to	<>	Not Equals to	>	Greater than
>=	Greater than or Equals to	<	Less than	<=	Less than or Equals to

Examples:

1) =If(B1="Male","He","She") Results - "He"

2) =If(B2>=18,"Adult","Child") Results - "Child"

3) =if(B3<20000,B3*10%,B3*20%) Results – 5000

4) =if(B4>=18,"Passed","Failed")

              Results – "Passed"

5) =if(B5>300000,"Rich","Poor")

              Results – "Rich"

6) =if(B3<50000,100,50) Results – 100

7) =if(B4<>30,1,2) Results -1

	A	B
1	Gender	Male
2	Age	16
3	Basic Salary	25000
4	Mark of Computerised Accounting	32
5	Annual Income	360000
6		

Nested IF

The IF function can be nested, when we have multiple conditions to meet. The FALSE value is being replaced by another If function to make a further test.

Syntax: =IF(Condition_1,Value_if_True_1,(Condition_2,Value_if_True_2,Value_if_False_2))

        Eg: 1. =if(A1=1,"Average",if(A1=2,"Good","Very Good")

At first the formula checks the first condition i.e. whether the cell contains the value 1 or not. If it contains '1' the condition becomes true, it gives the result 'Average" and stops the formula.

But if the cell A1 does not contain the value '1' the condition results FALSE. Then instead of giving a value for the FALSE, it starts checking another condition i.e. whether it contains the value 2.

If the second condition satisfies it gives the result "Good". Otherwise it gives the result "Very Good". In this way we can nest up to 64 ifs in spreadsheet.

Remember to close all if statement by putting as many closing brackets at the end of the statement based on the number of IF Statements.

        Eg: 2. Grade Calculation   =IF(A1>89,"A+",IF(A1>79,"A",IF(A1>69,"B+","D")))

AND

It checks more than one condition at the same time and returns TRUE if all the conditions are satisfied. Otherwise it returns FALSE.

Syntax: =AND(Condition 1, Condition 2……Condition 255) Eg:

=AND(B1>200000, B2>35000) Returns FALSE (Because 2nd condition not satisfied)

	A	B
1	Sales	325000
2	Gross Profit	30000
3	Net Profit	24000

=AND(B2<10000, B3>25000) Returns FALSE
(Because both conditions are not satisfied)
=AND(A1="Sales", B3<60000)   Returns TRUE (Because both conditions are satisfied)

=AND(A2="Gross Profit", B2=32000, B3<25000) Returns FALSE (Because one condition is not satisfied)

AND Function will be more useful when it is combined with IF Function. Consider the following examples based on the above table.

=if(AND(B1>250000,B2<50,000,B3=24000),"Yes","No")
This function checks three conditions and returns the result. They are:
      (1) Is the value in B1 is greater than 250000
      (2) Is the value in B2 is less than 50000
      (3) Is the value in B3 is equal to 24000

OR – If any of the argument is true, it return the result **True** and if all the arguments are wrong, it returns the result as **False**.

Syntax: Or(logical test 1, logical test 2, ….. logical test 255)

Eg: =Or(B1>200000,B2=30000) The result will be True as the first condition is correct.