Chapter – 2

SPREADSHEET

Electronic spreadsheet is a computer application software which allows the user to arrange and organise huge volume of data in tabular form. It facilitate arithmetic calculations, arrange and analyse data and provide easy correction of errors.

A file in spreadsheet is known as a '*Workbook*". A workbook is a collection of a number of 'worksheets'.

LibreOffice Calc

LibreOffice Calc is a spreadsheet application that we can use to calculate, analyse and manage data.

Features of LibreOffice Calc

1. ***Easy calculations*** This software provides a lot of tools with which we can perform complex calculations easily.
2. ***What-If Calculations*** : This help the users to predict what will happen if certain condition changes.
3. ***Serves as a database*** : A spreadsheet also performs the functions of a database.
4. ***Arranging Data*** : The data stored in a spreadsheet can be organised and reorganised according to the needs of the users.
5. ***Dynamic Charts*** : The inbuilt charts and graphs help to present data in an appealing manner.

Components of LIBREOFFICE CALC

1. ***Rows and Columns*** : The Worksheet in LibreOffice Calc contains Rows and Columns in Table format. Rows are named numerically i.e. 1,2,..... from top to bottom. On the otherhand, Columns are referred by alpha characters i.e. A,B,C,D..... from left to right.
2. ***Cell*** : The intersection of a Row and a Column is called a cell. eg. A1.
3. ***Range*** : Range is a group of cells that are highlighted in a worksheet. Eg. B2 : D8.

Naming Ranges

This means giving a name to a specific range. The procedure for 'Naming ranges' is given below :

1. Enter the scores of each student in from cell C2 to C15 in a worksheet .
2. Select the cells which are to be named i.e. C2:C15.
3. **Insert ->Names -> Define Range**
4. Enter the name of range i.e. *Score* in the window appeared and click 'Add'.

Spreadsheet Operations

1. ***Open Worksheet*** : We can open a new work by choosing 'New' option from the 'File menu. An existing workbook can be opened by choosing 'Open' option in the File menu.
2. ***Save Workbook*** : We can save a worksheet by choosing '*Save'* option in the File menu.
3. ***Close worksheet*** : We can close the worksheet by choosing '*Close*' option from the File menu.
4. ***Quit LibreOffice Calc :*** We can quit LibreOffice Calc by choosing *'Exit LibreOffice*' option from the file menu.
5. ***Add worksheet :*** To add worksheet, right click the mouse at sheet tab area and select '*insert sheet*' from the popup menu.
6. ***Delete worksheet*** : To delete unwanted worksheet, right click the mouse on the sheet tab to be deleted and select the *'Delete Sheet'* option from the popup menu.
7. ***Rename worksheet*** : To rename worksheet, right click the mouse on the sheet tab and select *'Rename Sheet'* option from the popup menu. Give the name desired and click OK.

Spreadsheet Navigation

Following navigation methods are available here :

1. Using Mouse
2. Using a cell reference
3. Using the Navigator

Types of Data

1. ***Value*** : Numerical data is called a value. It includes currency symbol, minus sign (-), plus sign (+), decimal point (.) and comma(,). For example, Age of employee, Salary of employee etc.

2. ***Label*** : The text data is called label. It includes alphabets and symbols. For example, Name of employee, Sex, Designation etc.
3. ***Formula*** : The formula is used to perform calculations. For example, =SUM(A2 : A4).

Components of a Formula

A standard formula may have three components :

I. Cell References
II.Mathematical operators
III.Functions

I.Cell References

A cell reference identifies the location of a cell or group of cells in the spreadsheet. A cell reference may be relative, absolute and mixed.

1. ***Relative Cell Reference*** : When a formula is copied to a new location in a worksheet, cell references in the formula change in relation to the new location of the formula, is called relative cell reference.
2. ***Absolute cell reference*** : The cell references in a formula remain the same even when the formula is copied to a new location is called absolute reference. For absolute cell reference, $(dollar) symbol as prefix before the column and row names in a formula.
3. ***Mixed cell reference*** : This is a combination of relative and absolute cell references. For example, $B4.

II. Mathematical Operators

The various types of mathematical operators are :

1. ***Arithmetic*** : This includes addition, subtraction, multiplication, division etc.
2. ***Comparison*** : This includes equal to, greater than, less than etc.
3. ***Reference*** : This includes range operator and union operator.

III. Functions

Functions are the pre-defined formulae in spreadsheet that return a specific result.

Classification of Functions

1.Date & Time Functions

The most commonly used Date & Time functions are :

1. ***TODAY*** : This function returns the current computer system date in the cell.

Syntax : =TODAY()

2. ***NOW*** : NOW function displays the current system date and time.
   Syntax : =NOW()
3. ***YEAR*** : YEAR function returns the 'year' from the date or date value given in the brackets.
   Syntax : YEAR("Date")
4. ***MONTH*** : MONTH function returns the month of a given date as an integer between 1 and 12.
   Syntax : =MONTH("date")
5. ***DAY*** : DAY function returns integer value of a given date (between 1 and 31).
   Syntax : DAY("DATE")
6. ***DATEVALUE*** : DATEVALUE function converts the given date and return its corresponding date value number.
   Syntax : =DATEVALUE("Text")
7. ***DATE*** : This function returns the date, when the year, month and day parameters are given as integer separated by commas.
   Syntax: =DATE(Year,Month,Day)

2.Statistical Functions

1. ***COUNT*** : This function counts the number of cell in a range that contain numbers.
   Syntax : = COUNT(Range)
2. ***COUNTA*** : This function counts the number of cells which contain any value including text.
   Syntax : =COUNTA(Range)
3. ***COUNTBLANK*** : This function counts the number of empty cells in the given range.
   Syntax : =COUNTBLANK(Range)
4. ***COUNTIF*** : This function counts the number of cells within a given range that meet the given criteria.
   Syntax : =COUNTIF(Range,Criteria)

3.Logical Functions

Logical functions are used to compare two values or statements. The commonly used logical functions are :

1. ***IF*** : It is used to test a condition, whether it is true or false.
   Syntax : =IF(Test, Then_Value,Otherwise_Value)
2. ***Nested IF*** : This function is used to test multiple conditions.

Syntax : IF(Test_1,Then Value_1,IF(Test_2,Then Value_2,IF(.....)))

3. ***AND*** : AND function is used to determine whether the output will be TRUE or FALSE.
   Syntax : AND(Logical Value 1, Logical Value 2,.....Logical Value 30)
4. ***OR*** : OR function is used to compare two values or statements.
   Syntax : =OR(Logical Value 1, Logical Value 2,.....Logical Value 30)

4.Mathematical functions

The commonly used mathematical functions are SUM and ROUND.

1. ***SUM*** : This function is used to get the sum of the given numbers, cells or range of cells.
   Syntax :=SUM(Range)
2. ***SUMIF*** : It only sums its values when a particular criteria is met.
   Syntax =SUMIF(Range,"criteria",sum_range)
3. ***ROUND*** : It is a function used to round-off a number to a certain number of decimal places.
   Syntax =ROUND(Number,Count)
   For example, ROUND(228.768,2) and the result will be 228.77.
4. ***ROUNDUP*** : This function rounds a number up away from zero.
   Syntax : ROUNDUP(number,count)
5. ***ROUNDDOWN*** : It rounds a number down towards zero.
   Syntax : ROUNDDOWN(Number,Count)

5.Text Functions

Commonly used text functions are TEXT and CONCATENATE.

1. ***TEXT*** : This function converts a number into text according to a user given format.
   Syntax : TEXT(Number,Format)
2. ***CONCATENATE*** : This function combines several text strings of different cells into one string.
   Syntax : =CONCATENATE("Text 1","Text 2", ..."Text 30")

6.Spreadsheet Functions

Calc also provides the following functions :

1. ***LOOKUP*** : LOOKUP function is use for searching certain values from a particular table.

2. ***VLOOKUP*** : VLOOKUP stands for Vertical LOOKUP. This will simply look for something in a range of cells and returns something that is in the same row.
   SYNTAX : =VLOOKUP(SearchCriterion,Array,Index,SortOrder).
3. ***HLOOKUP*** : HLOOKUP stands for horizontal lookup. It searches for values from top to bottom horizontally.
   Search : HLOOKUP(SearchCriterion,Array,Index,Sorted)

7.Financial Functions

1. ***ACCRINT*** :ACCRINT is used to calculate interest accrued on securities and bonds.
   Syntax : ACCRINT(Issue,First interest,Settlement,Rate,Par,Frequency,Basis)
2. ***RATE*** : The rate function is used to evaluate the rate of return on investment.
   Syntax : =RATE(Nper,Pmt,PV,Type,Guess)
3. ***CUMIPMT*** : It is used to calculate the cumulative interest payments.
   Syntax : CUMIPMT(Rate,Nper,PV,S,E,Type)
4. ***PV*** : This function is used to calculate the amount of money needed to be invested at a fixed rate today, to receive a specific amount after a specified period.
   Syntax : PV(Rate,Nper,Pmt,FV,Type)
5. ***PMT*** : This function helps to calculate the instalment amount of a loan or investment.
   Syntax : =PMT(Rate,Nper,PV,FV,Type)
6. ***FV*** : This function calculates the future value of an investment based on a constant interest rate.
   Syntax : *FV*(Rate,Nper,Pmt,PV,Type)
7. ***NPV*** : Net Present Value(NPV) is the present value of an investment's expected cash inflows minus the costs of acquiring the investment.
   Syntax : =NPV(Rate,Value 1, Value 2, Value 3.....)

Data Entry

The three options for entering data in a worksheet are :

1. Using key board
2. Data fill option
3. Import data from other software.

Data fill options

We can automatically fill cells with data with the Auto Fill command or the Series command.

Data Validation

Data validation guarantees that each data we enter will be correct and accurate.

Data formatting

It means the arrangement of data for computer input or output.

Preparation of Reports using data tables

There are two types of data tables :

1. One-variable data table and
2. Two-variable data table.

1. ***One-variable Data table*** : This data table allows you to get multiple results by changing anyone of the given variables.

2. ***Two-variable Data Table*** : A two-variable data table is a data table with two input values (Two variables) and a single result.

Preparation of Reports using Pivot Table

Pivot table is a tool for combining, comparing, and analysing large amounts of data easily. It is a table that summarizes source data in another table, displays the details of areas of interest and creates reports.

Uses of Pivot Table

1. Sub totalling an aggregating numeric data, summarising data by categories and sub categories, and creating custom calculations and formulae.
2. Summarising the data.
3. Moving rows to columns or columns to rows to show different summaries of the source data.
4. Filtering, sorting, grouping and conditionally formatting the most useful and the interesting subset of data to enable us to focus on the information that we want.
5. Presenting concise, attractive, and annotated online or printed reports.

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