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Spreadsheet

MS Excel

LibreOffice Calc

Data Analysis

Charts & Graphs



S.No.	Item	Quantity	Unit Price	Amount	Total
1	Laptop	5	45000	225000	
2	Mouse	10	500	5000	
3	Keyboard	8	700	5600	
4	Monitor	4	12000	48000	
5	UPS	6	3500	21000	
			Total	299600	

CREATE & EDIT SPREADSHEETS | FORMULAS & FUNCTIONS | CHARTS & ANALYSIS | DATA MANAGEMENT

Introduction to Spreadsheet

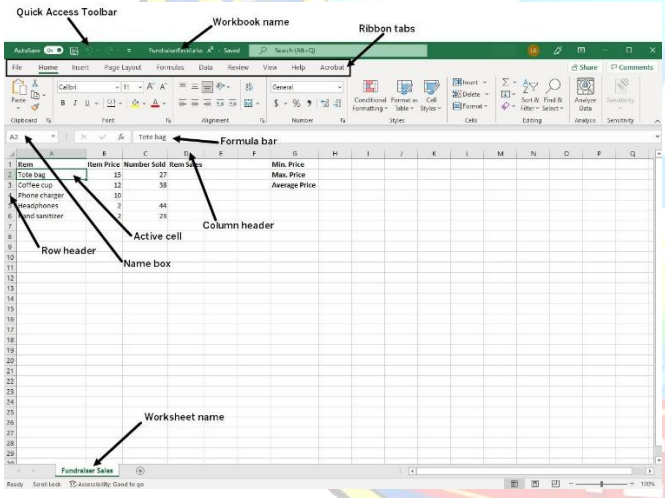
What is a Spreadsheet?

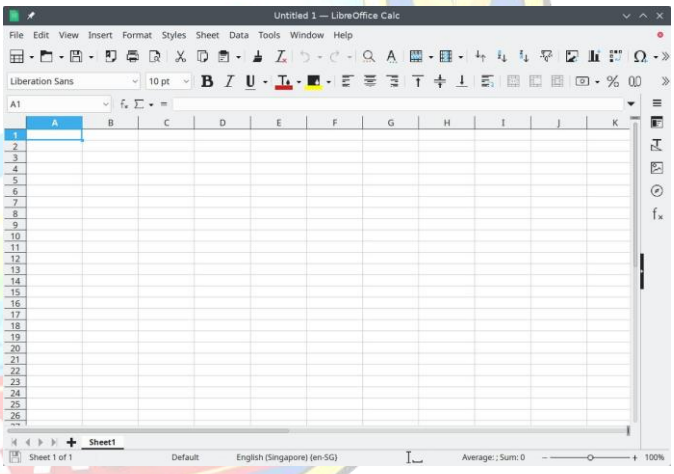
A Spreadsheet is a computer application used to store, organize, calculate, analyze, and present data in tabular form using rows and columns.

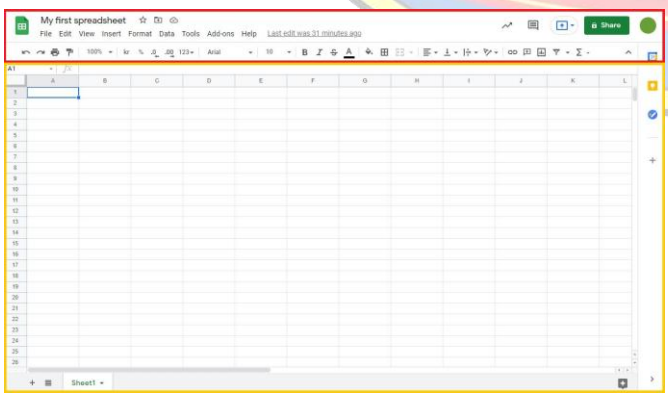
A spreadsheet consists of multiple cells arranged in rows and columns. It allows users to perform mathematical calculations, create charts, manage records, and analyze large amounts of data.

Examples of Spreadsheet Software:

1. Microsoft Excel
2. LibreOffice Calc
3. Google Sheets
4. WPS Spreadsheets
5. Apple Numbers







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Features of Spreadsheet

1. Data Entry: Stores text, numbers, dates, and formulas.
2. Calculations: Performs mathematical calculations using formulas and functions.
3. Data Formatting: Changes font, color, alignment, and cell appearance.
4. Sorting and Filtering: Arranges and displays selected data.
5. Charts and Graphs: Represents numerical data visually.
6. Data Analysis: Helps analyze information using functions and tools.
7. Multiple Worksheets: Allows multiple sheets within a workbook.
8. Printing: Provides page setup and printing facilities.
9. Data Management: Organizes large amounts of information.
10. Automatic Recalculation: Updates formula results when referenced values change.

Basic Spreadsheet Terminology

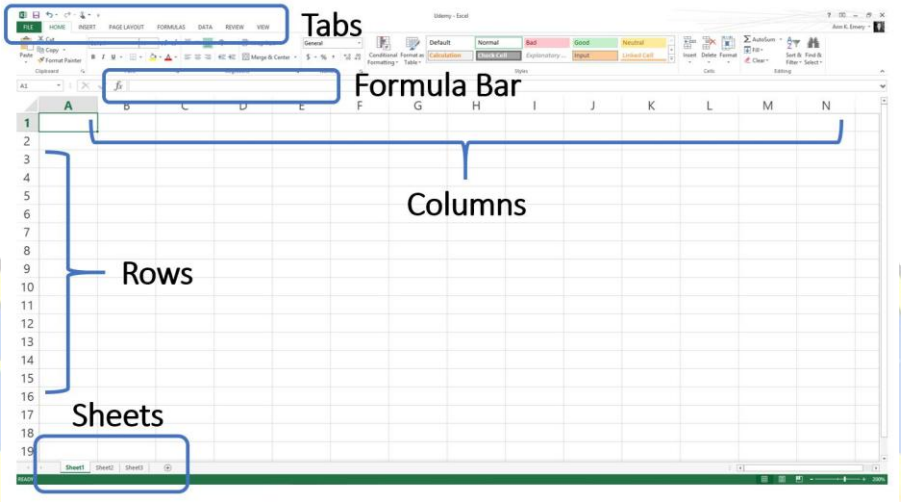
Term	Meaning
Workbook	A spreadsheet file containing one or more worksheets.
Worksheet	A single sheet consisting of rows and columns.
Row	Horizontal arrangement of cells, identified by numbers.
Column	Vertical arrangement of cells, identified by letters.
Cell	Intersection of a row and a column.
Cell Address	Unique reference of a cell, such as A1 or B5.
Active Cell	Currently selected cell.
Cell Range	Group of cells, such as A1:C10.
Formula	Expression used for calculation, such as =A1+B1.
Function	Predefined formula, such as =SUM(A1:A5).
Formula Bar	Area used to view or edit cell contents.
Name Box	Displays the selected cell address or defined name.

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Elements of Spreadsheet

Spreadsheet is an application used to organize, store, calculate, analyze, and present data in tabular form using rows and columns.

Examples: Microsoft Excel, LibreOffice Calc, Google Sheets.



Main Elements of a Spreadsheet

Element	Description
Title Bar	Displays the spreadsheet file name.
Menu Bar	Contains menus such as File, Edit, View, and Insert.
Toolbar/Ribbon	Provides commands for editing and formatting.
Name Box	Displays the address or name of the selected cell.
Formula Bar	Displays or edits data and formulas.
Row	Horizontal arrangement of cells, identified by numbers (1, 2, 3...).
Column	Vertical arrangement of cells, identified by letters (A, B, C...).
Cell	Intersection of a row and a column.
Active Cell	Currently selected cell.
Worksheet	A single sheet containing rows and columns.
Workbook	A spreadsheet file containing one or more worksheets.

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Sheet Tabs	Used to switch between worksheets.
Status Bar	Displays information such as Sum, Average, and Count.

Creating a Spreadsheet

Creating a spreadsheet means opening a new workbook to enter and manage data.

Steps in MS Excel:

1. Open Microsoft Excel.
2. Click File → New.
3. Select Blank Workbook.
4. A new spreadsheet will appear.

Steps in LibreOffice Calc:

1. Open LibreOffice Calc.
2. Select File → New → Spreadsheet.
3. A blank spreadsheet will open.

Shortcut Key: Ctrl + N — Create a new spreadsheet.

Concept of Cell Address (Row and Column) and Selecting a Cell

A Cell is the intersection of a row and a column. Each cell has a unique address called a Cell Reference.

Example of Cell Address

	A	B	C	D
1				
2				
3		B3		
4				

Cell B3 is located at the intersection of Column B and Row 3.

Examples:

- A1 = Column A, Row 1
- C5 = Column C, Row 5
- D10 = Column D, Row 10

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Methods of Selecting a Cell:

- Mouse: Click the required cell.
- Arrow Keys: Move between cells.
- Name Box: Type a cell address and press Enter.
- Ctrl + G: Open the Go To dialog box to select a cell or range.

Important: A group of selected cells is called a Cell Range, such as A1:C5.

Entering Data (Text, Number, Date) in Cells

A spreadsheet allows different types of data to be entered into cells.

Data Type	Description	Example
Text (Label)	Alphabetic or alphanumeric information	Student, Name
Number (Value)	Numeric data used in calculations	250, 85.5
Date	Represents a calendar date	25/10/2026
Formula	Performs calculations	=A1+B1

Steps to Enter Data:

1. Select the required cell.
2. Type the data.
3. Press Enter to confirm the entry.
4. Press Tab to move to the next cell.

Example: Student Marks Spreadsheet

A	B	C
Name	Marks	Date
Rahul	85	25/10/2026
Priya	92	26/10/2026
Amit	78	27/10/2026

Important Points:

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- Text is generally aligned to the left.
- Numbers are generally aligned to the right.
- Dates are stored as date values when recognized by the application.
- Formulas begin with the equal sign (=).
- Press F2 to edit the active cell.

Page Setup

Page Setup is used to adjust the layout and appearance of a spreadsheet before printing.

Main Page Setup Options

Option	Description
Orientation	Sets Portrait or Landscape mode.
Paper Size	Selects A4, A3, Letter, etc.
Margins	Sets space around the printed page.
Scaling	Adjusts worksheet content to fit pages.
Print Area	Defines the cells to be printed.
Header & Footer	Adds page number, date, title, etc.
Page Break	Controls where a new printed page begins.

Steps in MS Excel:

1. Open the Page Layout tab.
2. Select Margins, Orientation, or Size.
3. Configure the required settings.

Steps in LibreOffice Calc:

1. Click Format → Page Style.
2. Select the Page tab.
3. Adjust paper size, margins, and orientation.
4. Click OK.

Printing of Sheet

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Printing means producing a hard copy of spreadsheet data using a printer.

Steps:

1. Open the spreadsheet.
2. Press Ctrl + P.
3. Select the printer.
4. Choose the pages or sheets to print.
5. Set paper size, orientation, and number of copies.
6. Check the print preview.
7. Click Print.

Printing Options:

- Print selected cells.
- Print active sheet.
- Print the entire workbook.
- Print multiple copies.
- Print in Portrait or Landscape orientation.

Shortcut: Ctrl + P — Open Print dialog box.

Saving Spreadsheet

Saving means storing a spreadsheet file permanently on a storage device for future use.

Steps to Save

1. Click File → Save.
2. Select the destination folder.
3. Enter the file name.
4. Choose the file format.
5. Click Save.

Common Spreadsheet File Formats

Format	Extension	Application

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Excel Workbook	.xlsx	MS Excel
Excel 97–2003	.xls	Older Excel
OpenDocument Spreadsheet	.ods	LibreOffice Calc
CSV	.csv	Comma-separated data
PDF	.pdf	Document sharing/printing

Shortcut Keys:

- Ctrl + S — Save spreadsheet.
- Ctrl + Shift + S — Save As (commonly used in Excel and Calc).

Save vs Save As: Save updates the existing file, whereas Save As allows saving a copy with a different name, location, or format.

Opening and Closing Spreadsheet

Opening a Spreadsheet

Opening means accessing an existing spreadsheet file.

Steps:

1. Open MS Excel or LibreOffice Calc.
2. Click File → Open.
3. Browse and select the spreadsheet file.
4. Click Open.

Shortcut: Ctrl + O

Closing a Spreadsheet

Closing means closing the current spreadsheet document after completing the work.

Steps:

1. Click File → Close.
2. Save changes if prompted.
3. The spreadsheet will close.

Shortcut: Ctrl + W — Close the current workbook/document.

Alt + F4 — Close the application window on Windows.

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Manipulation of Cells & Sheet

Cell and Sheet Manipulation refers to modifying, formatting, arranging, copying, moving, and managing data within a spreadsheet.

It helps users organize information, improve readability, perform calculations, and manage worksheets efficiently.

Modifying / Editing Cell Content

Editing means changing or correcting existing data in a spreadsheet cell.

Methods of Editing:

1. Double-click: Double-click a cell to edit its contents.
2. F2 Key: Select a cell and press F2 to edit.
3. Formula Bar: Select a cell and modify its contents in the Formula Bar.
4. Direct Entry: Select a cell and type new data to replace the existing content.

Important Keys:

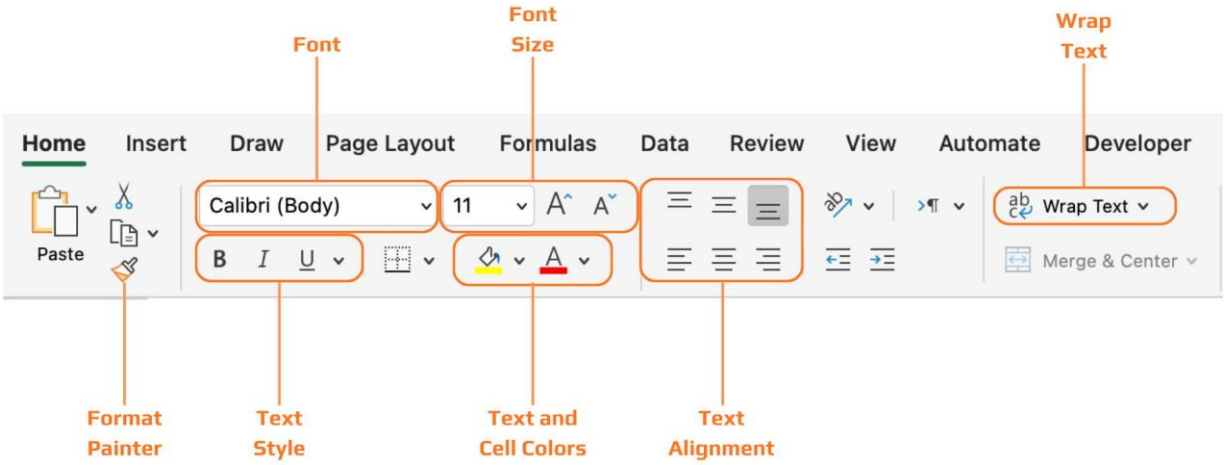
Key	Function
F2	Edit active cell
Enter	Confirm changes
Esc	Cancel editing
Delete	Clear selected cell contents
Ctrl + Z	Undo changes
Ctrl + Y	Redo changes

Example: Changing a student's marks from 75 to 85 in cell B2.

Formatting Cell (Font, Alignment, Style)

Cell Formatting means changing the appearance of data without changing its actual value.

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Types of Cell Formatting

Formatting	Description
Font	Changes font name, size and color.
Bold	Makes text darker and thicker.
Italic	Slants the text.
Underline	Draws a line below the text.
Alignment	Aligns data left, center or right.
Wrap Text	Displays long text on multiple lines within a cell.
Merge Cells	Combines multiple cells into one.
Borders	Adds lines around cells.
Fill Color	Changes cell background color.
Number Format	Displays numbers as currency, percentage, date, etc.
Cell Styles	Applies predefined formatting combinations.

Steps to Format Cells

In MS Excel:

1. Select the cell or range.
2. Open the Home tab.
3. Use Font, Alignment, Number or Cell Styles options.

In LibreOffice Calc:

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1. Select the cell or range.
2. Click Format → Cells.
3. Select Font, Font Effects, Alignment, Borders or Background.
4. Click OK.

Important Shortcut Keys:

Shortcut	Function
Ctrl + B	Bold
Ctrl + I	Italic
Ctrl + U	Underline
Ctrl + 1	Format Cells dialog box
Alt + Enter	Insert a line break within a cell in Excel

Cut, Copy, Paste & Paste Special

These operations are used to move, duplicate or transfer data between cells.

Operation	Description	Shortcut
Cut	Moves selected data to another location.	Ctrl + X
Copy	Duplicates selected data.	Ctrl + C
Paste	Inserts copied or cut data.	Ctrl + V
Paste Special	Pastes selected components of copied data.	Ctrl + Alt + V (Excel and Calc)

Steps

1. Select the required cell or range.
2. Press Ctrl + C to copy or Ctrl + X to cut.
3. Select the destination cell.
4. Press Ctrl + V to paste.

Paste Special

Paste Special allows users to paste specific parts of copied data instead of everything.

Common Paste Special Options:

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- Values: Pastes only values, not formulas.
- Formulas: Pastes formulas.
- Formats: Pastes only formatting.
- Transpose: Converts rows into columns and columns into rows.
- Operations: Performs calculations such as Add, Subtract, Multiply or Divide during pasting.

Example: Copying a formula result of 500 and pasting only the value 500.

Changing Cell Height and Width

In a spreadsheet, Row Height and Column Width can be adjusted to display data properly.

Changing Column Width

1. Select the required column.
2. Move the mouse pointer to the right boundary of its column heading.
3. Drag the boundary to increase or decrease width.

Changing Row Height

1. Select the required row.
2. Move the pointer to the bottom boundary of its row heading.
3. Drag the boundary to adjust height.

Other Methods

Method	Description
Manual Resize	Drag row or column boundaries.
AutoFit	Automatically adjusts size according to content.
Exact Size	Enter a specific row height or column width.

AutoFit: Double-click the boundary between column headings to automatically adjust column width.

Menu Options:

- MS Excel: Home → Format → Row Height / Column Width.
- LibreOffice Calc: Format → Rows / Columns → Height / Width.

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Inserting and Deleting Rows, Columns

Inserting adds new rows or columns, while deleting removes existing rows or columns.

Inserting a Row

1. Select a row heading.
2. Right-click and select Insert.
3. A new row is inserted above the selected row.

Inserting a Column

1. Select a column heading.
2. Right-click and select Insert.
3. A new column is inserted to the left.

Deleting Rows or Columns

1. Select the row or column heading.
2. Right-click and select Delete.
3. The selected row or column is removed.

Important: Deleting a row or column removes its cells and shifts the remaining cells, whereas clearing contents only removes the data.

Shortcut (Excel):

- Ctrl + + — Insert cells, rows or columns.
- Ctrl + - — Delete cells, rows or columns.

AutoFill

AutoFill is a spreadsheet feature used to automatically fill cells with repeated values, sequences, dates or formulas.

Steps to Use AutoFill

1. Enter a value or starting sequence in cells.
2. Select the cells.
3. Move the mouse pointer to the small square at the bottom-right corner of the selection (Fill Handle).

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4. Drag the Fill Handle in the required direction.

Examples of AutoFill

Initial Data	AutoFill Result
1, 2	3, 4, 5, 6...
10, 20	30, 40, 50...
Monday	Tuesday, Wednesday...
January	February, March...
01/01/2026	02/01/2026, 03/01/2026...

Uses of AutoFill:

- Creating number series.
- Filling dates and months.
- Copying formulas.
- Repeating data.
- Generating sequential records.

Sorting & Filtering

Sorting

Sorting means arranging data in a particular order, such as ascending or descending.

Types of Sorting:

- Ascending: A to Z, Smallest to Largest, Oldest to Newest.
- Descending: Z to A, Largest to Smallest, Newest to Oldest.

Steps:

1. Select a cell within the data range.
2. Open the Data tab/menu.
3. Select Sort.
4. Choose the column and sorting order.
5. Apply the sorting.

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Filtering

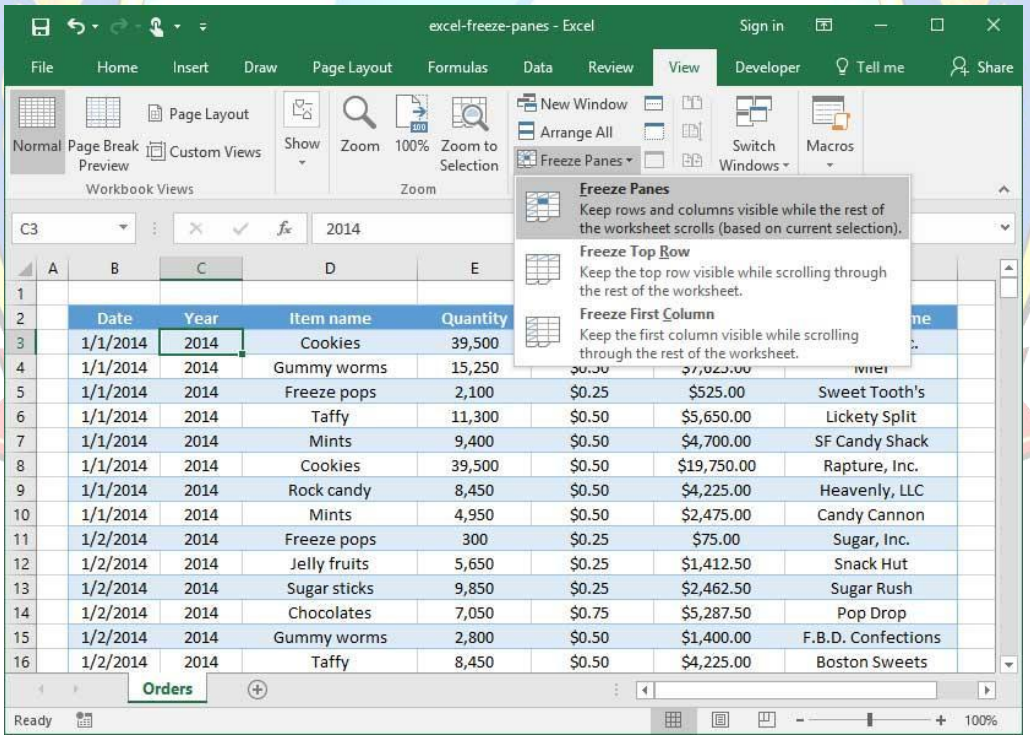
Filtering is used to display only the records that meet specified conditions while temporarily hiding other records.

Steps:

1. Select the data range with column headings.
2. Open the Data tab/menu.
3. Enable AutoFilter.
4. Click the filter arrow in a column heading.
5. Select the required condition.

Freezing Panes

Freeze Panes is a feature used to keep selected rows or columns visible while scrolling through a large spreadsheet.



Date	Year	Item name	Quantity			
1/1/2014	2014	Cookies	39,500			
1/1/2014	2014	Gummy worms	15,250			
1/1/2014	2014	Freeze pops	2,100	$0.25	$525.00	Sweet Tooth's
1/1/2014	2014	Taffy	11,300	$0.50	$5,650.00	Lickety Split
1/1/2014	2014	Mints	9,400	$0.50	$4,700.00	SF Candy Shack
1/1/2014	2014	Cookies	39,500	$0.50	$19,750.00	Rapture, Inc.
1/1/2014	2014	Rock candy	8,450	$0.50	$4,225.00	Heavenly, LLC
1/1/2014	2014	Mints	4,950	$0.50	$2,475.00	Candy Cannon
1/2/2014	2014	Freeze pops	300	$0.25	$75.00	Sugar, Inc.
1/2/2014	2014	Jelly fruits	5,650	$0.25	$1,412.50	Snack Hut
1/2/2014	2014	Sugar sticks	9,850	$0.25	$2,462.50	Sugar Rush
1/2/2014	2014	Chocolates	7,050	$0.75	$5,287.50	Pop Drop
1/2/2014	2014	Gummy worms	2,800	$0.50	$1,400.00	F.B.D. Confections
1/2/2014	2014	Taffy	8,450	$0.50	$4,225.00	Boston Sweets

Types of Freeze Panes

Type	Description
Freeze Top Row	Keeps the first row visible while scrolling.

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Freeze First Column	Keeps the first column visible.
Freeze Panes	Keeps rows above and columns to the left of the selected cell visible.

Steps in MS Excel

1. Open the View tab.
2. Click Freeze Panes.
3. Select Freeze Top Row, Freeze First Column or Freeze Panes.

Steps in LibreOffice Calc

1. Select the cell below the rows and to the right of the columns to freeze.
2. Click View → Freeze Rows and Columns.
3. The selected rows and columns remain visible during scrolling.

Example: To freeze the first row and first column together, select cell B2 and apply Freeze Panes.

Uses:

- Keeping headings visible.
- Working with large datasets.
- Comparing information across rows and columns.
- Improving spreadsheet navigation.

ormulas, Functions and Charts

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Formulas, Functions and Charts are important features of spreadsheet software used to perform calculations, analyze numerical data and represent information graphically.

- Formula: An expression used to perform calculations.
- Function: A predefined formula that performs a specific task.
- Chart: A graphical representation of worksheet data.

4.4.1 Using Formulas for Numbers (Addition, Subtraction, Multiplication & Division)

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A Formula is an expression that performs calculations using numbers, cell references and mathematical operators.

Important: Every spreadsheet formula normally begins with an equal sign (=).

Arithmetic Operators

Operation	Operator	Example	Result
Addition	+	=20+10	30
Subtraction	-	=20-10	10
Multiplication	*	=20*10	200
Division	/	=20/10	2
Exponentiation	^	=2^3	8
Percentage	%	=200*10%	20

Using Cell References in Formulas

Suppose cell A1 contains 20 and B1 contains 10.

Formula	Operation	Result
=A1+B1	Addition	30
=A1-B1	Subtraction	10
=A1*B1	Multiplication	200
=A1/B1	Division	2

Steps to Enter a Formula

1. Select the cell where the result should appear.
2. Type the equal sign (=).
3. Enter the formula, such as =A1+B1.
4. Press Enter to display the result.

Advantages: Formulas save time, reduce manual calculation errors and automatically recalculate when referenced values change.

Order of Calculation

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Spreadsheets follow mathematical operator precedence.

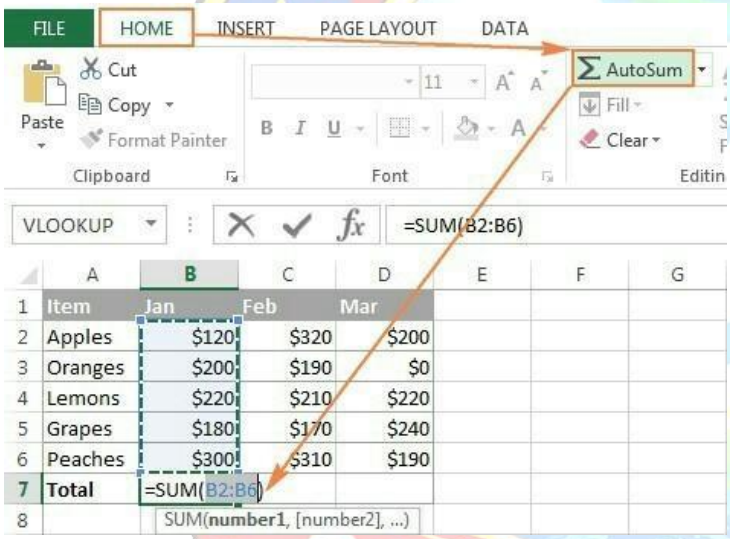
1. Parentheses ()
2. Exponentiation ^
3. Multiplication * and Division /
4. Addition + and Subtraction -

Operators at the same precedence level are generally evaluated from left to right.

Example: =10+5*2 gives 20, whereas =(10+5)*2 gives 30.

AutoSum

AutoSum is a spreadsheet feature used to quickly calculate the sum of a selected range of numbers without manually typing the complete SUM formula.



Steps to Use AutoSum

1. Enter numbers in consecutive cells.
2. Select the empty cell below or beside the numbers.
3. Click the AutoSum (Σ) button.
4. Check the automatically selected range.
5. Press Enter to display the total.

Example:

Cell	Value
A1	10

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A2	20
A3	30
A4	40
A5	=SUM(A1:A4)

Result: 100

Shortcut Key (MS Excel): Alt + = — Insert AutoSum.

Note: AutoSum commonly inserts the SUM() function.

Functions

A Function is a predefined formula that performs calculations or processes data using supplied values called arguments.

Syntax: =FUNCTION_NAME(argument1;argument2;...)

LibreOffice Calc commonly uses semicolons (;) to separate function arguments, while Microsoft Excel commonly uses commas (,). The separator may depend on regional settings.

Common Functions of Spreadsheet:

Mathematical Functions

These functions perform arithmetic and mathematical operations.

Function	Description	Example
SUM()	Adds numbers.	=SUM(10;20;30) → 60
PRODUCT()	Multiplies numbers.	=PRODUCT(2;3;4) → 24
ABS()	Returns absolute value.	=ABS(-25) → 25
SQRT()	Calculates square root.	=SQRT(64) → 8
POWER()	Calculates powers.	=POWER(2;3) → 8
MOD()	Returns division remainder.	=MOD(10;3) → 1
ROUND()	Rounds to specified decimal places.	=ROUND(12.567;2) → 12.57
ROUNDUP()	Rounds away from zero.	=ROUNDUP(12.34;1) → 12.4
ROUNDDOWN()	Rounds toward zero.	=ROUNDDOWN(12.39;1) → 12.3

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INT()	Rounds down to an integer.	=INT(12.9) → 12
TRUNC()	Removes decimal digits.	=TRUNC(12.89) → 12
EVEN()	Rounds away from zero to an even integer.	=EVEN(5) → 6
ODD()	Rounds away from zero to an odd integer.	=ODD(6) → 7
FACT()	Calculates factorial.	=FACT(5) → 120
GCD()	Finds greatest common divisor.	=GCD(12;18) → 6
LCM()	Finds least common multiple.	=LCM(4;6) → 12
PI()	Returns the value of π.	=PI() → 3.14159…
RAND()	Generates a random decimal from 0 to less than 1.	=RAND()
RANDBETWEEN()	Generates a random integer within a range.	=RANDBETWEEN(1;100)

Statistical Functions

Statistical functions are used to analyze, summarize and compare numerical data.

Function	Description
COUNT()	Counts cells containing numbers.
COUNTA()	Counts nonempty cells.
COUNTBLANK()	Counts empty cells in a range.
COUNTIF()	Counts cells matching one condition.
SUMIF()	Adds values matching a condition.
AVERAGE()	Calculates arithmetic mean.
AVERAGEIF()	Calculates average based on a condition.
MAX()	Returns largest value.
MIN()	Returns smallest value.

Logical Functions

Logical functions test conditions and return results based on whether the conditions are true or false.

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Function	Description	Example
IF()	Returns different results for TRUE/FALSE.	=IF(A1>=40;"Pass";"Fail")
AND()	TRUE if all conditions are TRUE.	=AND(A1>10;B1>10)
OR()	TRUE if at least one condition is TRUE.	=OR(A1>10;B1>10)
NOT()	Reverses a logical value.	=NOT(A1>10)

Text Functions

Text functions are used to manipulate, extract, combine and format text data.

Function	Description	Example
LEFT()	Extracts characters from the beginning.	=LEFT("INFOMAX";4) → INFO
RIGHT()	Extracts characters from the end.	=RIGHT("INFOMAX";3) → MAX
MID()	Extracts characters from the middle.	=MID("COMPUTER";2;3) → OMP
LEN()	Counts characters.	=LEN("COMPUTER") → 8
UPPER()	Converts text to uppercase.	=UPPER("hello") → HELLO
LOWER()	Converts text to lowercase.	=LOWER("HELLO") → hello
PROPER()	Capitalizes words.	=PROPER("computer academy") → Computer Academy
TRIM()	Removes extra spaces.	=TRIM(" Hello World ") → Hello World
CONCATENATE()	Joins text values.	=CONCATENATE("Info";"max") → Infomax
REPLACE()	Replaces characters by position.	=REPLACE("ABCDE";2;2;"XY") → AXYDE
FIND()	Finds text position (case-sensitive).	=FIND("M";"INFOMAX") → 5
SEARCH()	Finds text position (case-insensitive).	=SEARCH("max";"INFOMAX") → 5

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Date and Time Functions

These functions are used to calculate and manage dates and times.

Function	Description	Example
TODAY()	Returns current date.	=TODAY()
NOW()	Returns current date and time.	=NOW()
DATE()	Creates a date.	=DATE(2026;10;30)
TIME()	Creates a time.	=TIME(10;30;0)
DAY()	Extracts day from date.	=DAY(DATE(2026;10;30)) → 30
MONTH()	Extracts month.	=MONTH(DATE(2026;10;30)) → 10
YEAR()	Extracts year.	=YEAR(DATE(2026;10;30)) → 2026
HOUR()	Extracts hour.	=HOUR(TIME(14;30;0)) → 14
MINUTE()	Extracts minute.	=MINUTE(TIME(14;30;0)) → 30
SECOND()	Extracts second.	=SECOND(TIME(14;30;45)) → 45
WEEKDAY()	Returns weekday number.	=WEEKDAY(DATE(2026;10;30)) → 6
DAYS()	Calculates days between dates.	=DAYS(DATE(2026;10;30);DATE(2026;10;20)) → 10

Lookup and Reference Functions

These functions search for data in a worksheet and return related information.

Function	Description
VLOOKUP()	Searches vertically in a table.
HLOOKUP()	Searches horizontally in a table.

Database Functions

Database functions perform calculations on tabular data based on specified criteria.

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Function	Description
DSUM()	Adds matching database records.
DCOUNT()	Counts numeric values in matching records.
DCOUNTA()	Counts nonempty matching records.
DAVERAGE()	Calculates average of matching records.
DMAX()	Returns maximum matching value.
DMIN()	Returns minimum matching value.

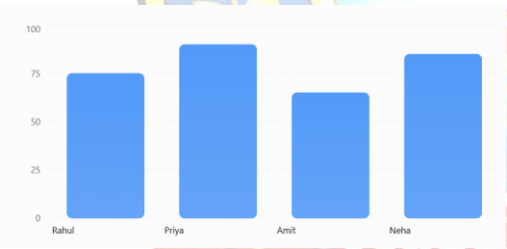
Charts

A Chart is a graphical representation of spreadsheet data. Charts help users compare values, understand relationships, identify trends and analyze information visually.

LibreOffice Calc provides 10 main chart types, with several subtypes and display variations.

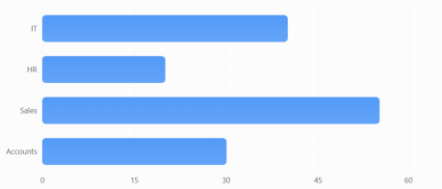
1. Column Chart

A Column Chart displays data using vertical rectangular columns. It is useful for comparing values across categories.



2. Bar Chart

A Bar Chart displays data using horizontal rectangular bars.



3. Pie Chart

A Pie Chart is a circular chart divided into sectors representing proportions of a total.

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4. Area Chart

An Area Chart displays values using lines with the area below them filled. It emphasizes magnitude and changes over time.



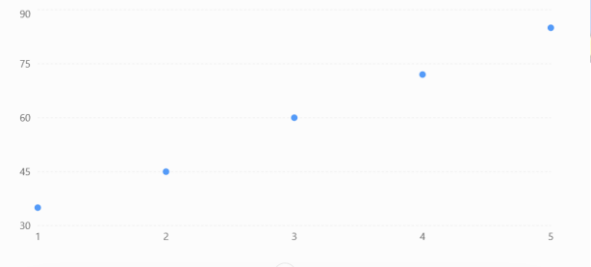
5. Line Chart

A Line Chart displays data points connected by lines to show trends or changes over time.



6. XY (Scatter) Chart

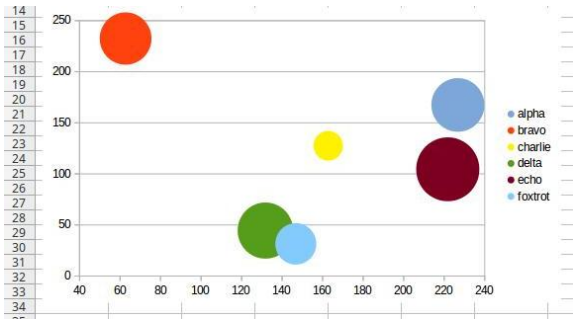
An XY Chart displays numerical data as points using X and Y coordinates. It is useful for studying relationships between two variables.



7. Bubble Chart

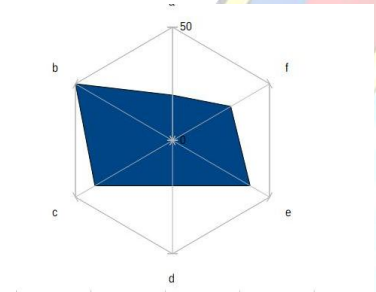
A Bubble Chart is an extension of an XY Scatter Chart. It represents three numerical variables using the X-position, Y-position and bubble size.

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8. Net (Radar) Chart

A Net Chart, also called a Radar Chart, displays multiple variables on axes radiating from a common center.



9. Stock Chart

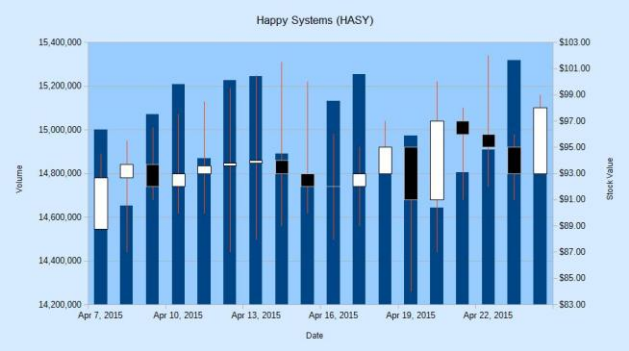
A Stock Chart is used to display financial market data such as opening, closing, highest and lowest prices.

Common Subtypes:

- Low–High–Close
- Open–Low–High–Close
- Volume–Low–High–Close
- Volume–Open–Low–High–Close

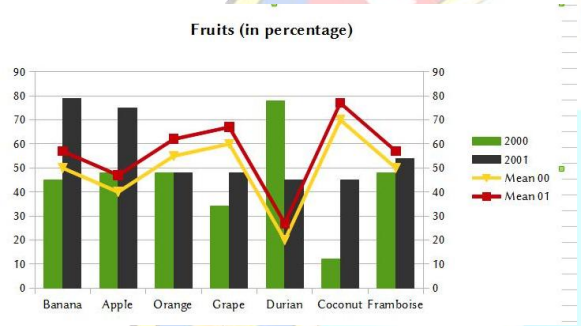
Uses: Stock market analysis, price fluctuations and financial reporting.

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10. Column and Line Chart

A Column and Line Chart combines vertical columns and lines in a single chart to compare different data series.



Steps to Create a Chart

In MS Excel:

1. Enter data into the worksheet.
2. Select the required data range.
3. Click the Insert tab.
4. Select a chart type (Bar, Pie or Line).
5. Customize the chart title, labels and appearance.

In LibreOffice Calc:

1. Select the required data range.
2. Click Insert → Chart.
3. Choose the chart type.
4. Set data ranges and chart elements.
5. Click Finish.

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Main Elements of a Chart

Element	Description
Chart Title	Displays the name of the chart.
Chart Area	Entire area containing the chart.
Plot Area	Area where data is displayed graphically.
X-Axis	Usually displays categories or time.
Y-Axis	Usually displays numerical values.
Legend	Identifies different data series.
Data Series	Group of related values represented in the chart.
Data Labels	Display values or names on chart elements.

What-If Analysis

What-If Analysis is a spreadsheet feature used to examine how changes in input values affect the results of formulas.

It helps users predict outcomes, compare different situations and make decisions without permanently changing the original data.

Example: What will happen to profit if sales increase by 20%?

Main What-If Analysis Tools

Tool	Description
Goal Seek	Finds the input value needed to achieve a desired result.
Scenario Manager	Creates and compares different sets of input values.
Data Table (Excel)	Calculates results for multiple input values.
Solver	Finds an optimal solution using constraints.

Applications: Budget planning, loan calculations, sales forecasting, profit analysis and examination marks prediction.

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Goal Seek

Goal Seek is a What-If Analysis tool used to find the required input value that produces a specified result in a formula.

It works backward from the desired result to calculate the necessary input.

Example: Finding Required Marks

Suppose a student wants to achieve a total of 250 marks in three subjects.

Cell	Subject	Marks
B2	English	80
B3	Computer	75
B4	Mathematics	60
B5	Total	=SUM(B2:B4)

Current Total = 215

Desired Total = 250

Goal Seek will calculate the required Mathematics marks as 95.

Steps in LibreOffice Calc

1. Enter the marks and total formula.
2. Select the formula cell B5.
3. Click Tools → Goal Seek.
4. Enter the following values:
    - Formula Cell: B5
    - Target Value: 250
    - Variable Cell: B4
5. Click OK.
6. Accept the calculated result if required.

Steps in MS Excel

1. Select the formula cell.

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2. Click Data → What-If Analysis → Goal Seek.
3. Set Cell: B5.
4. To Value: 250.
5. By Changing Cell: B4.
6. Click OK.

Scenario Manager

Scenario Manager is a What-If Analysis tool used to create, save and compare different sets of input values.

It allows users to examine multiple possible situations without repeatedly entering data.

Example: Business Profit Analysis

Profit = Sales – Expenses

Scenario	Sales	Expenses	Profit
Best Case	₹80,000	₹40,000	₹40,000
Normal Case	₹60,000	₹40,000	₹20,000
Worst Case	₹45,000	₹40,000	₹5,000

Steps in LibreOffice Calc

1. Enter the input values and formulas.
2. Select the cells containing the input values.
3. Click Tools → Scenarios.
4. Enter a scenario name, such as Best Case.
5. Click OK.
6. Create additional scenarios with different input values.
7. Switch between scenarios to compare results.

Steps in MS Excel

1. Open Data → What-If Analysis → Scenario Manager.
2. Click Add.
3. Enter the scenario name and changing cells.

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4. Enter scenario values.
5. Save and compare the scenarios.

Solver

Solver is an advanced What-If Analysis tool used to find the best possible result by changing multiple variables while satisfying specified conditions or constraints.

Example: A company wants to maximize profit while keeping production costs within its budget.

Uses of Solver

- Maximizing profit.
- Minimizing expenses.
- Optimizing production.
- Resource allocation.
- Budget optimization.

LibreOffice Calc: Tools → Solver

MS Excel: Data → Solver (when the Solver add-in is enabled).

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