What is Excel Tool?

Microsoft Excel is a spreadsheet software developed by Microsoft.
It is used to **store, organize, calculate, and analyze data** in the form of **rows and columns**.

Excel allows users to:

- Enter large amounts of data
- Perform calculations using formulas
- Create tables, charts, and graphs
- Analyze data easily and quickly

In simple words:
Excel is a tool to manage and analyze data efficiently.

Why is Excel Important for Data Analytics?

Excel is one of the **most important tools in Data Analytics**, especially for beginners.

Reasons why Excel is important:

1. **Easy to Learn**
   - Excel is user-friendly and does not require coding knowledge.
2. **Data Cleaning**
   - Helps in removing errors, duplicates, and blank values.
   - Features like **Flash Fill**, **Text to Columns**, and **Filters** are very useful.
3. **Data Analysis**
   - You can use **sorting, filtering, formulas, and Pivot Tables** to analyze data.
4. **Data Visualization**
   - Excel can create **charts, graphs, and dashboards** for better understanding.
5. **Widely Used in Industry**
   - Almost every company uses Excel for reporting and data analysis.

That's why **Excel is the first step in the Data Analytics journey**.

What is AutoFill in Excel?

AutoFill is a feature in Excel that automatically fills data in cells based on a pattern.

Examples:

- Numbers: `1, 2, 3 → 4, 5, 6`
- Dates: `01-01-2025 → 02-01-2025`
- Formulas: Copies the same formula to other cells

How AutoFill Works:

1. Enter data in a cell
2. Select the cell
3. Drag the **fill handle** (small square at the bottom-right corner)

AutoFill saves time and reduces manual work.

What is Flash Fill in Excel?

Flash Fill is a smart feature that automatically fills data by recognizing patterns.

Example:

If you have:

- Full Name: `Neeraj Katheriya`
- You type `Neeraj` in the next column

Excel automatically fills all first names.

How to Use Flash Fill:

- Type sample data
- Press **Ctrl + E**
- Excel fills the remaining data automatically

Flash Fill is very useful for **data cleaning**.

How to Convert Comma-Separated Data in Excel?

Comma-separated data means data is in **one cell separated by commas**.

Example:

```
Neeraj,23,Lucknow,Data Analyst
```

Steps to Convert into Columns:

1. Select the cell or column
2. Go to **Data** tab
3. Click on **Text to Columns**
4. Choose **Delimited**
5. Click **Next**
6. Select **Comma (,)**
7. Click **Finish**

Result:

Name	Age	City	Profession
Neeraj	23	Lucknow	Data Analyst

C. Conditional Formatting

Formats cells based on conditions.

Examples:

- Highlight values greater than 50
- Color negative numbers in red
- Show data bars or color scales

Steps:

- Select data
- Home → **Conditional Formatting**
- Choose rule

Helps in **quick data analysis**.

Sorting in Excel (Home Tab)

Sorting means arranging data in a specific order.

Types of Sorting:

1. **Ascending Order**
   - A → Z (Text)
   - Small → Large (Numbers)
   - Oldest → Newest (Dates)
2. **Descending Order**
   - Z → A
   - Large → Small
   - Newest → Oldest

How to Sort Data:

1. Select a column or data range
2. Go to **Home → Editing Group**
3. Click:
   - **Sort A to Z**
   - **Sort Z to A**

Custom Sorting:

Used when sorting by:

- Multiple columns
- Cell color
- Font color
- Values

Steps:

1. Select data
2. Home → Sort & Filter → **Custom Sort**
3. Choose column and order

Very important for **reports and dashboards**.

Sorting vs Filtering (Short Note)

- **Sorting** arranges data in order
- **Filtering** shows only required data and hides the rest

Both are heavily used in **Data Analytics**.

Arithmetic Formulas in MS Excel

Arithmetic formulas are used in Excel to perform **basic mathematical calculations** like addition, subtraction, multiplication, division, averages, and percentages. These formulas are very important for **data analysis, reports, and calculations**.

1. Addition Formula (+)

Formula:

```
=A1 + B1
```

Use:

Adds values from two or more cells.

Example:

If
A1 = 10
B1 = 20

Result = **30**

Multiple cells:

```
=A1 + B1 + C1
```

2. SUM Function (Most Used)

Formula:

```
=SUM(A1:A5)
```

Use:

Adds a **range of cells** quickly.

Example:

Adds all values from A1 to A5.

Very common in marksheets, salary sheets, and data analytics

3. Subtraction Formula (-)

Formula:

```
=A1 - B1
```

Use:

Subtracts one value from another.

Example:

A1 = 50
B1 = 20

Result = **30**

Excel does **not** have a SUBTRACT function; we use -.

4. Multiplication Formula (*)

Formula:

```
=A1 * B1
```

Use:

Multiplies values.

Example:

A1 = 5
B1 = 4

Result = **20**

5. Division Formula (/)

Formula:

```
=A1 / B1
```

Use:

Divides one number by another.

Example:

A1 = 100
B1 = 4

Result = **25**

If divisor is 0, Excel shows **#DIV/0! error**

6. AVERAGE Function

Formula:

```
=AVERAGE(A1:A5)
```

Use:

Finds the **average (mean)** of numbers.

Example:

Values: 10, 20, 30, 40, 50
Average = **30**

Very useful in **result analysis and data analytics**

7. MIN Function

Formula:

```
=MIN(A1:A10)
```

Use:

Finds the **smallest value** in a range.

Example:

Minimum marks, lowest salary, lowest sales, etc.

8. MAX Function

Formula:

```
=MAX(A1:A10)
```

Use:

Finds the **largest value** in a range.

Example:

Highest marks, maximum sales, highest score.

9. COUNT Function

Formula:

```
=COUNT(A1:A10)
```

Use:

Counts **only numeric values**.

Does not count text or blank cells.

10. COUNTA Function

Formula:

```
=COUNTA(A1:A10)
```

Use:

Counts **all non-empty cells** (numbers + text).

11. Percentage Formula

Formula:

```
=(A1 / B1) * 100
```

Use:

Calculates percentage.

Example:

Marks obtained = 450
Total marks = 500

```
=(450/500)*100
```

Result = **90%**

12. Power Formula (Exponent)

Formula:

```
=A1 ^ B1
```

Use:

Raises a number to a power.

Example:

```
=5^2
```

Result = **25**

13. ABS Function (Absolute Value)

Formula:

```
=ABS(A1)
```

Use:

Converts negative values into positive.

Example:

A1 = -20
Result = **20**

14. ROUND Function

Formula:

```
=ROUND(A1, 2)
```

Use:

Rounds a number to given decimal places.

Example:

12.3456 → **12.35**

15. MOD Function (Remainder)

Formula:

```
=MOD(A1, B1)
```

Use:

Returns the **remainder** after division.

Example:

```
=MOD(10,3)
```

Result = **1**

16. Basic Formula Rule (Very Important)

All Excel formulas **start with =**
Cell references change automatically (Relative Reference)
Use brackets `()` to control calculation order

Example:

```
=(A1+B1)*C1
```

Summary Table

Formula	Use
+	Addition
-	Subtraction
*	Multiplication
/	Division
SUM()	Total
AVERAGE()	Mean
MIN()	Lowest
MAX()	Highest
COUNT()	Numbers only
COUNTA()	Non-empty cells
ROUND()	Rounding
MOD()	Remainder

Text Functions in MS Excel

Text functions are used to **work with text data** such as names, emails, codes, addresses, and descriptions.

1. CONCAT / CONCATENATE (Join Text)

Formula:

```
=CONCAT(A1, B1)
```

or

```
=CONCATENATE(A1, " ", B1)
```

Use:

Joins two or more text values.

Example:

A1 = John
B1 = Doe

Result → **John Doe**

`CONCAT` is newer and preferred.

2. TEXTJOIN (Advanced Join)

Formula:

```
=TEXTJOIN(" ", TRUE, A1, B1, C1)
```

Use:

Joins multiple cells with a separator.

Example:

First Name, Middle Name, Last Name

3. LEFT Function

Formula:

```
=LEFT(A1, 4)
```

Use:

Extracts text from **left side**.

Example:

A1 = ExcelData
Result → **Exce**

4. RIGHT Function

Formula:

```
=RIGHT(A1, 4)
```

Use:

Extracts text from **right side**.

Example:

A1 = ExcelData
Result → **Data**

5. MID Function

Formula:

```
=MID(A1, 2, 4)
```

Use:

Extracts text from the **middle**.

Example:

A1 = Excel
Result → **xcel**

6. LEN Function

Formula:

```
=LEN(A1)
```

Use:

Counts number of characters (including spaces).

Example:

A1 = Data Analysis
Result → **13**

7. TRIM Function (Very Important)

Formula:

```
=TRIM(A1)
```

Use:

Removes **extra spaces** (leading & trailing).

Very useful in **data cleaning**.

8. UPPER Function

Formula:

```
=UPPER(A1)
```

Use:

Converts text to **capital letters**.

9. LOWER Function

Formula:

```
=LOWER(A1)
```

Use:

Converts text to **small letters**.

10. PROPER Function

Formula:

```
=PROPER(A1)
```

Use:

Capitalizes **first letter of each word**.

Example:

john doe → **John Doe**

11. FIND Function (Case-Sensitive)

Formula:

```
=FIND("a", A1)
```

Use:

Finds position of a character (case-sensitive).

12. SEARCH Function (Not Case-Sensitive)

Formula:

```
=SEARCH("a", A1)
```

Use:

Finds position of text (ignores case).

Preferred in most cases.

13. REPLACE Function

Formula:

```
=REPLACE(A1, 1, 4, "Data")
```

Use:

Replaces part of text using position.

14. SUBSTITUTE Function (Very Important)

Formula:

```
=SUBSTITUTE(A1, "old", "new")
```

Use:

Replaces **specific text**.

Example:

Excel-Data → Excel Data

15. TEXT Function

Formula:

```
=TEXT(A1, "dd-mm-yyyy")
```

Use:

Formats numbers or dates as text.

Very useful in reports.

16. VALUE Function

Formula:

```
=VALUE(A1)
```

Use:

Converts text numbers into **numeric values**.

17. EXACT Function

Formula:

```
=EXACT(A1, B1)
```

Use:

Checks if two text values are **exactly same**.

Result → TRUE / FALSE

18. CLEAN Function

Formula:

```
=CLEAN(A1)
```

Use:

Removes **non-printable characters**.

Useful for imported data.

Summary Table (Quick Revision)

Function	Use
CONCAT	Join text
LEFT	Extract left text
RIGHT	Extract right text
MID	Extract middle
LEN	Text length
TRIM	Remove extra spaces
UPPER	Capital letters
LOWER	Small letters
PROPER	First letter capital
FIND	Find position (case-sensitive)
SEARCH	Find position
SUBSTITUTE	Replace text
TEXT	Format text
VALUE	Text to number
CLEAN	Remove hidden characters