Basic concepts of EXCEL

1. Basics of Excel

1.1 Interface & Navigation

Excel Interface Components

- **Ribbon & Tabs:** The ribbon consists of tabs (Home, Insert, Formulas, etc.) that contain commands.
- **Quick Access Toolbar (QAT):** Allows quick access to frequently used commands like Save, Undo, and Redo.
- **Formula Bar:** Displays formulas and allows you to edit cell contents.
- **Workbook & Worksheets:**
  - A **Workbook** is an Excel file that contains multiple **Worksheets (spreadsheets)**.
  - Each worksheet consists of **cells** arranged in **rows and columns**.
- **Cells, Rows, Columns:**
  - **Columns:** Labeled A, B, C, etc.
  - **Rows:** Numbered 1, 2, 3, etc.
  - **Cells:** The intersection of a row and a column (e.g., A1, B5).
- **Sheets Management:**
  - Rename, delete, move, copy sheets for organizing data efficiently.

1.2 Data Entry & Formatting

Entering Data

- Simply click on a cell and type a value (text, number, or date).
- Press **Enter** to move down, **Tab** to move right.

Cell Formatting

- Change fonts, text color, background color, borders, and alignment.

Number Formatting

- **General:** Default format for numbers/text.
- **Number:** Standard numerical representation with decimal places.
- **Currency & Accounting:** Format numbers as money values.
- **Date & Time:** Display dates (e.g., DD/MM/YYYY) and time.
- **Percentage:** Converts decimal values to percentages.

Conditional Formatting

- Highlights cells based on conditions (e.g., cells greater than 100 turn red).
- **Examples:**
  - Highlight sales above ₹10,000.
  - Color-code performance levels (green = good, red = bad).

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2. Excel Functions & Formulas

2.1 Arithmetic & Logical Functions

- SUM(A1:A5): Adds numbers in A1 to A5.
- AVERAGE(A1:A5): Finds the average of values.
- COUNT(A1:A5): Counts numeric values in the range.
- IF(A1>50, "Pass", "Fail"): Returns “Pass” if A1 is greater than 50, else “Fail”.
- AND(A1>50, B1<100): Checks if both conditions are true.
- OR(A1>50, B1<100): Checks if either condition is true.

2.2 Lookup & Reference Functions

- VLOOKUP(value, table, column_index, [range_lookup])
  - Example: Find the price of a product in a list.
- HLOOKUP(value, table, row_index, [range_lookup])
  - Searches horizontally.
- XLOOKUP(value, lookup_array, return_array, [if_not_found])
  - Advanced lookup replacing VLOOKUP.
- INDEX(array, row_num, column_num): Returns the value at a specific row and column.
- MATCH(value, array, match_type): Finds the position of a value in a range.

2.3 Text Functions

- CONCATENATE(A1, B1): Joins text from two cells.
- TEXTJOIN(", ", TRUE, A1:A3): Joins text with a separator.
- LEFT(A1, 5): Extracts first 5 characters.
- RIGHT(A1, 3): Extracts last 3 characters.
- MID(A1, 3, 4): Extracts 4 characters starting from position 3.
- LEN(A1): Counts number of characters.
- TRIM(A1): Removes extra spaces.
- SUBSTITUTE(A1, "old", "new"): Replaces text.

2.4 Date & Time Functions

- TODAY(): Returns the current date.
- NOW(): Returns the current date and time.
- DATE(2024, 1, 15): Creates a date.
- YEAR(A1), MONTH(A1), DAY(A1): Extracts parts of a date.
- DATEDIF(start_date, end_date, "Y"): Calculates age or difference in years.

2.5 Statistical & Math Functions

- COUNTIF(A1:A10, ">50"): Counts numbers greater than 50.
- SUMIF(A1:A10, ">50"): Sums numbers greater than 50.
- RANK(A1, A1:A10): Ranks a value in a dataset.
- LARGE(A1:A10, 2): Finds the second largest value.

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3. Data Analysis & Management

3.1 Sorting & Filtering

- **Sorting:** Arrange data in ascending or descending order.
- **Filtering:** Show only relevant data based on conditions.

3.2 Data Validation

- Restrict data entry using dropdown lists, numerical limits, or custom formulas.

3.3 Pivot Tables & Pivot Charts

- **Pivot Tables:** Summarize large data sets dynamically.
- **Pivot Charts:** Visual representation of Pivot Table data.

3.4 What-If Analysis

- **Goal Seek:** Find input needed to reach a target output.
- **Scenario Manager:** Compare multiple scenarios.

3.5 Power Query (Data Cleaning & Transformation)

- Import and transform data from various sources.
- Merge & clean data efficiently.

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4. Charts & Data Visualization

- **Column & Bar Charts:** Compare data visually.
- **Line Chart:** Show trends over time.
- **Pie Chart:** Display proportions.
- **Scatter Plot:** Show relationships between variables.

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5. Automation & Macros

5.1 Macros

- **Recording Macros:** Automate repetitive tasks.
- **Running Macros:** Execute pre-recorded actions.

5.2 VBA (Visual Basic for Applications)

- Write custom scripts to extend Excel's capabilities.

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6. Collaboration & Security

- **Sharing Workbooks:** Allow multiple users to edit.
- **Protecting Sheets & Workbooks:** Prevent accidental modifications.
- **Track Changes & Comments:** Monitor edits made by collaborators.

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7. Advanced Excel Features

7.1 Power Pivot

- Advanced data modeling using **DAX (Data Analysis Expressions)**.

7.2 Power BI Integration

- Connect Excel data with **Power BI** for advanced reporting.

7.3 SQL & Excel

- Import & analyze data from **SQL databases**.

7.4 Business Intelligence (BI) Tools

- Excel as a BI tool for dashboards and reports.