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What is Microsoft Excel?

Microsoft Excel is a spreadsheet application used to organize, analyze, and visualize data.

Add (Summing Values)

Adding values together in Excel is done using the `SUM` function.

Fill (AutoFill)

AutoFill allows you to quickly fill cells with repetitive or sequential data.

Split (Text to Columns)

This feature splits text in one column into multiple columns.

Transpose

Transposing switches rows to columns or columns to rows.

Array Formula

An array formula performs multiple calculations on one or more items in an array (range of cells).

Sort

Sorting arranges data in ascending or descending order.

Filter

Filters allow you to display only the data that meets certain criteria.

Table

Tables help manage and analyze data with features like sorting, filtering, and formatting.

Drop-down (Data Validation)

A drop-down list lets you select a value from predefined options.

Charts

Charts visually represent data to make trends and comparisons easier to understand.

Horizontal Axis & Vertical Axis

The **horizontal axis** (X-axis) shows categories, while the **vertical axis** (Y-axis) shows values in a chart.

Secondary Axis

A secondary axis helps when comparing two sets of data with different value ranges in the same chart.

Functions and Formulas

Functions are predefined formulas in Excel that perform calculations using specific values.

Examples: MAX, MIN

`MAX` returns the highest value, and `MIN` returns the lowest.

ROUND

The `ROUND` function rounds numbers to a specified number of decimal places.

AVERAGE

The `AVERAGE` function calculates the mean of a range of numbers.

COUNTIF

`COUNTIF` counts the number of cells that meet a specific condition.

IF

The `IF` function returns one value if a condition is true and another if it's false.

COUNT

`COUNT` counts the number of numeric entries in a range.

INDEX/MATCH

`INDEX` returns the value at a specific position in a range, while `MATCH` finds the position.

PRODUCT

The `PRODUCT` function multiplies all the numbers in a given range.

SUM

The `SUM` function adds up all the numbers in a specified range.

AND

The `AND` function checks if multiple conditions are true. It returns **TRUE** if all conditions are true, otherwise **FALSE**.

OR

The `OR` function checks if at least one condition is true. It returns **TRUE** if any condition is true.

AVERAGEIF

The `AVERAGEIF` function averages cells that meet a specific condition.

LEFT

The `LEFT` function extracts a specified number of characters from the start of a text string.

RIGHT

The `RIGHT` function extracts a specified number of characters from the end of a text string.

Conditional Formatting

Conditional Formatting highlights cells based on certain conditions (e.g., color scales, icons, data bars).

Pivot Tables and Charts

PivotTables summarize, analyze, and explore large datasets by rearranging (or "pivoting") data.

Excel Lookup Functions

VLOOKUP

`VLOOKUP` searches for a value in the first column of a range and returns a value in the same row from another column.

HLOOKUP

`HLOOKUP` searches for a value in the first row and returns a value from a specified row below it.

INDEX/MATCH

`INDEX` returns the value at a specific position in a range, and `MATCH` finds the position of a value.

XLOOKUP

`XLOOKUP` searches a range or array and returns the corresponding item, replacing `VLOOKUP` and `HLOOKUP`.

LOOKUP

`LOOKUP` searches for a value in a range and returns a value from another range. It’s older and less flexible than `XLOOKUP`

Data Analysis in Excel

Descriptive Statistics

Descriptive statistics summarize data with measures like mean, median, and standard deviation.

Mean, Median, Standard Deviation

- **Mean:** Average of numbers.
- **Median:** Middle value in a dataset.

- **Standard Deviation:** Measures how spread out the values are.

Regression

Regression analyzes the relationship between dependent and independent variables

Correlation

Correlation measures the strength and direction of a relationship between two variables.

ANOVA (Analysis of Variance)

ANOVA compares means across multiple groups to see if they differ significantly.

Sampling

Sampling selects a subset of data from a larger dataset for analysis.

Histogram

A histogram shows the distribution of data by grouping it into bins.

Create Bin Ranges (Intervals)

A **bin** is a range of values that groups your data. For example, if you want to group scores in intervals of 10, your bins would be **60, 70, 80, 90, 100**.