**Microsoft Excel**

Formulas:

Formulas are the expressions created by the user to perform a specific calculation.

Formula = 3+4

Function:

Functions are built in predefined calculations or operations that have specific syntax and names.

Function = sum ()

COUNT Function:

Counts cells with numeric or date value and returns the count of such values in a range.

SUM Function:

Adds up numeric value and returns the sum of the numeric values in a range.

COUNTIF Function:

COUNTIF is used to count the number of cells in a range that meets a specific condition or criteria. It counts the cells that satisfy the given condition within a specified range.

SUMIF Function:

SUMIF is used to add up the values in a range that meets a specific condition or criteria. It sums the values of cells that meet the specified condition within a specified range.

MIN Function:

Finds and returns the smallest numeric value in a specified range of cells.

MAX Function:

Finds and returns the largest numeric value in a specified range of cells.

AVERAGE Function:

Calculates and returns the arithmetic mean (average) of numeric values in a specified range of cells.

IF Function:

Allows you to perform different calculations or return different values based on whether a specified condition is true or false.

AND Function:

Evaluates multiple conditions and returns TRUE only if all of the specified conditions are true; if any one condition is false, it returns FALSE.

OR Function:

Evaluates multiple conditions and returns TRUE if any of the specified conditions are true, otherwise, it returns FALSE.

IS Functions (e.g., ISNUMBER, ISTEXT, ISBLANK):

These functions are used to check whether a given value meets specific criteria. For example, ISNUMBER checks if a value is a numeric type and returns TRUE if it is, or FALSE if it's not. Similarly, ISTEXT checks if a value is text, and ISBLANK checks if a cell is empty and returns TRUE or FALSE accordingly. These functions help determine the data type or status of a cell's content.

ROUND Function:

The ROUND function is used to round a numeric value to a specified number of decimal places, and it rounds to the nearest even number when there's a tie.

ROUNDUP Function:

The ROUNDUP function is used to round a numeric value up to the nearest specified number of decimal places, always rounding up even if the decimal part is less than 0.5.

ROUNDDOWN Function:

The ROUNDDOWN function is used to round a numeric value down to the nearest specified number of decimal places, always rounding down even if the decimal part is more than 0.5.

CONCATENATE Function:

The CONCATENATE function combines multiple text strings into one by joining them together in the order you specify.

LEN Function:

The LEN function calculates and returns the number of characters in a given text string.

LEFT Function:

The LEFT function extracts a specified number of characters from the beginning (left) of a text string.

RIGHT Function:

The RIGHT function extracts a specified number of characters from the end (right) of a text string.

MID Function:

The MID function extracts a specific number of characters from the middle of a text string, starting from a specified position.

UPPER Function:

The UPPER function converts all the characters in a text string to uppercase.

LOWER Function:

The LOWER function converts all the characters in a text string to lowercase.

PROPER Function:

The PROPER function capitalizes the first letter of each word in a text string and converts the rest of the letters to lowercase.

TRIM Function:

The TRIM function removes extra spaces (leading, trailing, and multiple consecutive spaces) from a text string, leaving only single spaces between words.

SUBSTITUTE Function:

The SUBSTITUTE function replaces occurrences of a specified substring within a text string with a new substring.

REPLACE Function:

The REPLACE function replaces a specified number of characters within a text string with a new text string, starting at a specified position.

Mean:

The mean, often referred to as the average, is a measure of central tendency. It's calculated by adding up all the values in a dataset and then dividing the sum by the number of values. The mean provides a measure of the "average" value in a dataset.

Median:

The median is another measure of central tendency. It's the middle value in a dataset when the values are arranged in ascending or descending order. If there is an even number of values, the median is the average of the two middle values. The median represents the middle value that separates the higher half from the lower half of the dataset.

Mode:

The mode is the value that appears most frequently in a dataset. It represents the value that occurs with the highest frequency. A dataset can have one mode (unimodal), multiple modes (multimodal), or no mode if all values occur with the same frequency. The mode provides information about the most common value(s) in the dataset.

FREQUENCY Function:

The FREQUENCY function in Excel is used to count how often values occur within a set of data. It creates a frequency distribution by counting the number of values that fall within specified ranges or bins. This function is commonly used for creating histograms or frequency tables to analyze data distribution.

Variance (var):

Variance is a measure of how spread out the values in a dataset are from the mean (average). It quantifies the degree to which data points differ from the mean by calculating the average of the squared differences between each data point and the mean. A higher variance indicates greater dispersion in the data.

Square Root(sqrt):

The square root is a mathematical operation that, when applied to a number, yields another number that, when multiplied by itself, equals the original number. It is often used to find the positive square root of a number, and it can be used to reverse the squaring process.

Standard Deviation (stdev.p):

Standard deviation is a statistical measure of the dispersion or spread of data points in a dataset. It is the square root of the variance and provides a more interpretable measure of how data values deviate from the mean. A lower standard deviation indicates that data points are closer to the mean, while a higher standard deviation indicates greater variability in the data.

Percentile:

A percentile is a statistical measure that indicates the relative position of a specific value within a dataset. It represents the value below which a given percentage of data falls. For example, the 25th percentile is the value below which 25% of the data falls. Percentiles are useful for understanding the distribution of data and identifying values at specific percentiles, such as the median (50th percentile) or quartiles (25th and 75th percentiles).

Percentile Rank:

Percentile rank is a measure that indicates the percentage of data values that are less than or equal to a specific value in a dataset. It provides insight into where a particular data point stands in relation to the entire dataset. For example, if a value has a percentile rank of 75, it means that 75% of the data values are less than or equal to that value. Percentile rank helps assess the relative position of a data point within a dataset.

Data Cleaning:

It is a process of identifying and fixing the errors.

This can be done by -

Removing the duplicates

Handling data

Standardizing data

Handling outliers

Lookups:

Lookup are the functions used for searching and retrieving data based on your criteria.

VLOOKUP:

VLOOKUP (Vertical Lookup) is a function in Excel used to search for a value in the first column of a table or range and retrieve a corresponding value from another column. It's commonly used for data retrieval and lookup tasks.

HLOOKUP:

HLOOKUP (Horizontal Lookup) is similar to VLOOKUP but searches for a value in the first row of a table or range and retrieves a corresponding value from another row. It's used when data is organized horizontally.

XLOOKUP:

XLOOKUP is a more versatile and powerful function introduced in later versions of Excel. It can perform both vertical and horizontal lookups, and it offers more flexible features, such as handling errors more gracefully and returning arrays of values.

A pivot table is a powerful data analysis tool in Microsoft Excel (and other spreadsheet software) used for summarizing, analyzing, and presenting large amounts of data in a concise and organized format. It allows you to transform complex and unstructured data into a more understandable and structured form, making it easier to extract insights and trends.

Here's a brief overview of what a pivot table is and what it does:

What It Is: A pivot table is a dynamic table that allows you to arrange and summarize data from a spreadsheet or database. It consists of rows, columns, values, and filters, providing a flexible and interactive way to explore data.

What It Does:

Summarization: You can use a pivot table to summarize data by performing operations like sum, count, average, or other mathematical calculations on the data.

Grouping: You can group data by categories, dates, or other factors to create meaningful insights.

Filtering: Pivot tables allow you to filter data to focus on specific subsets or criteria.

Rearranging: You can easily rearrange and pivot (change) the way data is presented, such as switching rows to columns and vice versa.

Drilling Down: You can drill down into the details of summarized data to see individual records that make up the summary.

Charts: Pivot tables often work well with pivot charts, allowing you to visualize your data.

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| --- | --- |
| Feature | Maximum limit |
| Open workbooks | Limited by available memory and system resources |
| Total number of rows and columns on a worksheet | 1,048,576 rows by 16,384 columns |
| Column width | 255 characters |
| Row height | 409 points |
| Page breaks | 1,026 horizontal and vertical |
| Total number of characters that a cell can contain | 32,767 characters |
| Characters in a header or footer | 255 |
| Maximum number of line feeds per cell | 253 |
| Sheets in a workbook | Limited by available memory (default is 1 sheet) |
| Colors in a workbook | 16 million colors (32 bit with full access to 24 bit color spectrum) |
| Named views in a workbook | Limited by available memory |
| Unique cell formats/cell styles | 65,490 |
| Fill styles | 256 |
| Line weight and styles | 256 |
| Unique font types | 1,024 global fonts available for use; 512 per workbook |
| Number formats in a workbook | Between 200 and 250, depending on the language version of Excel that you have installed |
| Names in a workbook | Limited by available memory |
| Windows in a workbook | Limited by available memory |
| Hyperlinks in a worksheet | 65,530 |
| Panes in a window | 4 |
| Linked sheets | Limited by available memory |
| Scenarios | Limited by available memory; a summary report shows only the first 251 scenarios |
| Changing cells in a scenario | 32 |
| Adjustable cells in Solver | 200 |
| Custom functions | Limited by available memory |
| Zoom range | 10 percent to 400 percent |
| Reports | Limited by available memory |
| Sort references | 64 in a single sort; unlimited when using sequential sorts |
| Undo levels | 100 |
| Fields in a data form | 32 |
| Workbook parameters | 255 parameters per workbook |
| Items displayed in filter drop-down lists | 10,000 |
| Noncontiguous cells that can be selected | 2,147,483,648 cells |
| Maximum limits of memory storage and file size for Data Model workbooks | 32-bit environment is subject to 2 gigabytes (GB) of virtual address space, shared by Excel, the workbook, and add-ins that run in the same process. A data model’s share of the address space might run up to 500 – 700 megabytes (MB), but could be less if other data models and add-ins are loaded.  64-bit environment imposes no hard limits on file size. Workbook size is limited only by available memory and system resources.  Beginning with Excel 2016, Large Address Aware functionality lets 32-bit Excel consume twice the memory when users work on a 64-bit Windows operating system. For more information, see [Large Address Aware capability change for Excel](https://support.microsoft.com/en-us/kb/3160741).  Note: Adding tables to the Data Model increases the file size. If you don’t plan to create complex Data Model relationships using many data sources and data types in your workbook, uncheck the Add this data to the Data Model box when you import or create tables, pivot tables, or data connections.  For more information, see [Data Model specification and limits](https://support.microsoft.com/en-au/office/data-model-specification-and-limits-19aa79f8-e6e8-45a8-9be2-b58778fd68ef). |
| Processor Cores | 64 |
| File name length | 218 characters - This includes the file path. For example, C:\Username\Documents\FileName.xlsx. |