all excel formulas with examples

Excel Formulas are essential tools for anyone looking to analyze data, perform calculations, and automate tasks in Microsoft Excel. With a wide array of built-in functions, Excel empowers users to manipulate and extract valuable insights from their data. This article will explore various Excel formulas, providing clear explanations and practical examples to enhance your understanding and usage of these powerful tools.

Understanding Excel Formulas

Excel formulas typically start with an equals sign (=) followed by the function name and its arguments. Arguments can be numbers, cell references, or ranges of cells. The basic structure of an Excel formula is:

```
=FUNCTION_NAME(argument1, argument2, ...)
```

For example, the formula to add the values in cells A1 and A2 would look like this:

```
=A1 + A2
```

Common Excel Formulas

In this section, we will explore some of the most commonly used Excel formulas, categorized based on their functionality.

Mathematical Functions

1. SUM: Adds a range of numbers.
- Syntax: `=SUM(number1, [number2], ...)`
- Example: `=SUM(A1:A5)` adds all values from cells A1 to A5.

2. AVERAGE: Calculates the average of a group of numbers.
- Syntax: `=AVERAGE(number1, [number2], ...)`
- Example: `=AVERAGE(B1:B5)` computes the average of values in cells B1 to B5.

3. COUNT: Counts the number of cells that contain numbers.
- Syntax: `=COUNT(value1, [value2], ...)`
- Example: `=COUNT(C1:C10)` counts all the cells with numeric values in the range C1 to C10.

4. MAX: Finds the largest number in a range.
- Syntax: `=MAX(number1, [number2], ...)`
- Example: `=MAX(D1:D10)` returns the maximum value from the specified range.

5. MIN: Finds the smallest number in a range.
- Syntax: `=MIN(number1, [number2], ...)`
- Example: `=MIN(E1:E10)` returns the minimum value from the specified range.

Text Functions

1. CONCATENATE: Joins two or more strings together.
- Syntax: `=CONCATENATE(text1, [text2], ...)`
- Example: `=CONCATENATE("Hello", " ", "World")` results in "Hello World".

2. LEFT: Extracts a specified number of characters from the left side of a text string.
- Syntax: `=LEFT(text, [num_chars])`
- Example: `=LEFT(A1, 4)` returns the first four characters from the text in cell A1.

3. RIGHT: Extracts a specified number of characters from the right side of a text string.
- Syntax: `=RIGHT(text, [num_chars])`
- Example: `=RIGHT(B1, 3)` returns the last three characters from the text in cell B1.

4. MID: Extracts a substring from a text string.
- Syntax: `=MID(text, start_num, num_chars)`
- Example: `=MID(C1, 2, 3)` extracts three characters starting from the second character of the string in cell C1.

5. TRIM: Removes extra spaces from text except for single spaces between words.
- Syntax: `=TRIM(text)`
- Example: `=TRIM(D1)` cleans up text in cell D1 by removing unnecessary spaces.

Logical Functions

1. IF: Returns one value if a condition is true and another value if it's false.
- Syntax: `=IF(logical_test, value_if_true, value_if_false)`
- Example: `=IF(E1 > 50, "Pass", "Fail")` returns "Pass" if the value in E1 is greater than 50, otherwise "Fail".

2. AND: Returns TRUE if all conditions are true.
- Syntax: `=AND(logical1, [logical2], ...)`
- Example: `=AND(A1 > 10, B1 < 5)` returns TRUE if both conditions are met.

3. OR: Returns TRUE if at least one condition is true.
- Syntax: `=OR(logical1, [logical2], ...)`
- Example: `=OR(A1 > 10, B1 < 5)` returns TRUE if either condition is met.

4. NOT: Reverses the logical value of its argument.
- Syntax: `=NOT(logical)`
- Example: `=NOT(A1 > 10)` returns TRUE if A1 is not greater than 10.

Lookup and Reference Functions

1. VLOOKUP: Searches for a value in the leftmost column of a table and returns a value in the same row from a specified column.
- Syntax: `=VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])`
- Example: `=VLOOKUP(A1, B1:D10, 2, FALSE)` looks for the value in A1 in the first column of the range B1:D10 and returns the corresponding value from the second column.

2. HLOOKUP: Searches for a value in the top row of a table and returns a value in the same column from a specified row.
- Syntax: `=HLOOKUP(lookup_value, table_array, row_index_num, [range_lookup])`
- Example: `=HLOOKUP(A1, B1:E5, 3, FALSE)` looks for the value in A1 in the first row of the range B1:E5 and returns the corresponding value from the third row.

3. INDEX: Returns the value of a cell in a specified row and column of a range.
- Syntax: `=INDEX(array, row_num, [column_num])`
- Example: `=INDEX(A1:C3, 2, 3)` returns the value from the second row and third column of the range A1:C3.

4. MATCH: Returns the relative position of an item in an array that matches a specified value.
- Syntax: `=MATCH(lookup_value, lookup_array, [match_type])`
- Example: `=MATCH("Apple", A1:A5, 0)` returns the position of "Apple" in the range A1:A5.

Advanced Excel Formulas

Beyond the basic functions, Excel offers more advanced formulas that can be combined to perform complex calculations.

Array Formulas

Array formulas can perform multiple calculations on one or more items in an array. They are entered using Ctrl + Shift + Enter.

1. SUMPRODUCT: Multiplies corresponding components in the given arrays, and returns the sum of those products.
- Syntax: `=SUMPRODUCT(array1, [array2], ...)`
- Example: `=SUMPRODUCT(A1:A5, B1:B5)` calculates the sum of the products of corresponding values in the two ranges.

2. TRANSPOSE: Changes the orientation of a range from vertical to horizontal or vice versa.
- Syntax: `=TRANSPOSE(array)`
- Example: If A1:A3 contains values, `=TRANSPOSE(A1:A3)` will convert them into a horizontal array.

Dynamic Array Functions (Excel 365)

With the introduction of dynamic arrays, Excel has also added new functions that return arrays.

1. FILTER: Returns an array that meets specified criteria.
– Syntax: `=FILTER(array, include, [if_empty])`
– Example: `=FILTER(A1:A10, B1:B10 > 50)` filters values in A1:A10 where the corresponding B1:B10 values are greater than 50.

2. UNIQUE: Returns a list of unique values from a range.
– Syntax: `=UNIQUE(array, [by_col], [exactly_once])`
– Example: `=UNIQUE(A1:A10)` returns a list of unique values from the range A1:A10.

3. SORT: Sorts the contents of a range or array.
– Syntax: `=SORT(array, [sort_index], [sort_order], [by_col])`
– Example: `=SORT(A1:A10, 1, 1)` sorts the values in A1:A10 in ascending order based on the first column.

Conclusion

Excel formulas are a powerful aspect of data management and analysis that can greatly enhance your productivity. From basic mathematical calculations to advanced data manipulation techniques, understanding how to use these formulas

Frequently Asked Questions

What is the SUM formula in Excel and how is it used?

The SUM formula adds up a range of numbers. For example, =SUM(A1:A5) will sum all values from cells A1 to A5.

How can I use the AVERAGE formula in Excel?

The AVERAGE formula calculates the mean of a group of numbers. For example, =AVERAGE(B1:B10) calculates the average of the values in cells B1 through B10.

What does the VLOOKUP formula do in Excel?

VLOOKUP stands for 'Vertical Lookup'. It searches for a value in the first column of a table and returns a value in the same row from a specified column. Example: =VLOOKUP(D1, A1:B10, 2, FALSE) looks for the value in D1 within A1:A10 and returns the corresponding value from column B.

How do I use the IF formula in Excel?

The IF formula checks whether a condition is met and returns one value for TRUE and another for FALSE. For example: =IF(C1>100, 'Over Budget', 'Within Budget') will display 'Over Budget' if C1 is greater than 100, otherwise

'Within Budget'.

What is the CONCATENATE function in Excel?

The CONCATENATE function joins two or more strings together. For example, =CONCATENATE(A1, ' ', B1) combines the contents of A1 and B1, separated by a space.

How does the COUNTIF formula work?

COUNTIF counts the number of cells that meet a specific condition. For example, =COUNTIF(A1:A10, '>50') counts how many cells in the range A1:A10 have values greater than 50.

What is the purpose of the TODAY function in Excel?

The TODAY function returns the current date. For example, =TODAY() will display today's date in the cell.

How can I use the INDEX and MATCH functions together?

INDEX and MATCH are often used together to perform lookups. For example, =INDEX(B1:B10, MATCH('SearchValue', A1:A10, 0)) returns the value from B1:B10 that corresponds to 'SearchValue' found in A1:A10.

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