Microsoft Excel Data Analysis Cheat Sheet

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Functions & Formula

Basic Functions

- **SUM(range):** Adds up all the numbers in a range.
- **AVERAGE(range):** Calculates the average of a group of numbers.
- **STDEV.S(range):** Calculates the standard deviation for a sample.
- **COUNT(range):** Counts the number of cells that contain numbers.
- **MAX(range):** Returns the largest number in a set of values.
- **MIN(range):** Returns the smallest number in a set of values.

Conditional Functions

- **IF(logical_test, value_if_true, [value_if_false]):** Evaluates a condition and returns one value if that condition is true, and another value if the condition is false.
    - **logical_test:** The condition you want to check. This can involve comparisons using operators like >, <, =, >=, <=, or <>.
    - **value_if_true:** The value that is returned if the condition (logical_test) is true.
    - **value_if_false:** The value that is returned if the condition (logical_test) is false. This argument is optional; if omitted and the condition is false, the function will return FALSE.
    - **Example:** If you want to assign a pass or fail status based on a student's score in column B (assuming a passing score is 50), your formula would look like: IF(B:B >= 50, "Pass", "Fail").
- **SUMIF(range, criteria, [sum_range]):** Adds up all the numbers in a range that meet a specific criterion.
    - **range:** The range of cells that you want evaluated by the criteria.
    - **criteria:** The condition that determines which cells to add. This can be a number, text, expression, or even a cell reference.
    - **sum_range**: The actual cells to add together if their corresponding cells in the range match the criteria. If omitted, Excel adds the cells in the range.

    - **Example:** Suppose you want to sum all sales greater than $500 in column B; your formula would look like: SUMIF(B:B, ">500")
- **COUNTIF(range, criteria):** Counts the number of cells within a range that meet the given condition.
    - **range:** The range of cells from which to count non-blank cells.
    - **criteria:** The condition that determines which cells to count. Similar to SUMIF, this can be expressed as a number, text, expression, or cell reference.
    - **Example:** If you want to count how many sales are over $500 in column B, you would use: COUNTIF(B:B, ">500")
- **AVERAGEIF(range, criteria, [average_range]):** Calculates the average (mean) of all the numbers in a range that meet a specific criterion.
    - **range:** The range of cells that you want evaluated by the criteria.
    - **criteria:** The condition that determines which cells to average.
    - **average_range:** The actual cells to average if their corresponding cells in the range match the criteria. If omitted, Excel averages the cells in the range.
    - **Example:** If you want to calculate the average sales for amounts greater than $500 in column B, your formula would look like: AVERAGEIF(B:B, ">500")

Date and Time Functions

- **NOW():** Returns the current date and time.
- **DATE(year, month, day):** Returns the sequential serial number that represents a particular date.
- **DAY(date):** Returns the day of the month.
- **MONTH(date):** Returns the month of a date represented by a serial number.
- **YEAR(date):** Returns the year of a date represented by a serial number.

Others Statistical Functions

- **MEDIAN(range):** Returns the median of the given numbers.
- **MODE.SNGL(range):** Returns the most frequently occurring number in a data set.
- **VAR.S(range):** Calculates the variance for a sample.

Text Functions

- **CONCATENATE(text1, [text2], ...):** Joins two or more text strings into one string.
- **UPPER(text):** Converts text to uppercase.
- **LOWER(text):** Converts text to lowercase.
- **TRIM(text):** Removes spaces from text except for single spaces between words.

Lookup & Reference Functions

- **VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup]):** Searches vertically down the first column of a given range for a key and returns the value of a specified cell in the row found.
    - **lookup_value:** The value to search for in the first column of the table_array.
    - **table_array:** The range of cells that contains the data. You can use a reference to a range or a range name.
    - **col_index_num:** The column number in the table_array from which to retrieve the value. Column 1 is the first column.
    - **range_lookup:** (Optional) A logical value: TRUE (approximate match) or FALSE (exact match). If omitted, the default is TRUE.
    - **Example:** If you have a table of employees in columns A to C with employee IDs, names, and roles, and you want to find the name of the employee with ID 12345, your formula would look like: VLOOKUP(12345, A:C, 2, FALSE).
- **HLOOKUP(lookup_value, table_array, row_index_num, [range_lookup]):** Searches horizontally across the top row of a given range for a key and returns the value of a specified cell in the column found.
    - **lookup_value:** The value to search for in the first row of the table_array.
    - **table_array:** The range of cells that contains the data.

  - **row_index_num:** The row number in the table_array from which to retrieve the value. Row 1 is the first row.
  - **range_lookup:** (Optional) A logical value: TRUE (approximate match) or FALSE (exact match). If omitted, the default is TRUE.
  - **Example:** If you have a table where different products are listed in the first row and months in subsequent rows, and you want to find the sales figure for Product X in February, your formula would look like: HLOOKUP("Product X", A1:Z12, 2, FALSE).
- **XLOOKUP(lookup_value, lookup_array, return_array, [if_not_found], [match_mode], [search_mode]):** Searches a range or an array, and returns an item corresponding to the first match it finds. If a match doesn't exist, then XLOOKUP can return the closest (approximate) match. This function can be used to replace both VLOOKUP and HLOOKUP functions.
  - **lookup_value:** The value to search for.
  - **lookup_array:** The array or range to search.
  - **return_array:** The array or range to return.
  - **if_not_found:** (Optional) The value to return if no match is found.
  - **match_mode:** (Optional) Specifies the match type: 0 (exact match), -1 (exact match or next smaller item), 1 (exact match or next larger item), 2 (wildcard match).
  - **search_mode:** (Optional) Specifies the search mode: 1 (search from first to last), -1 (search from last to first), 2 (binary search ascending), -2 (binary search descending).
  - **Example:** If you need to find the salary of an employee named John from a table where employee names are in column A and salaries in column B, your formula would look like: XLOOKUP("John", A:A, B:B, "Not Found").

Keyboard Shortcuts

General Shortcuts

- Ctrl + N: Create a new workbook.
- Ctrl + O: Open an existing workbook.
- Ctrl + S: Save a workbook.
- Ctrl + P: Print a workbook.
- Ctrl + C: Copy selected cells.
- Ctrl + X: Cut selected cells.
- Ctrl + V: Paste content from the clipboard.
- Ctrl + Z: Undo an action.
- Ctrl + Y: Redo an action.

Navigation Shortcuts

- Arrow Keys: Move one cell up, down, left, or right.
- Ctrl + Arrow Key: Move to the edge of data regions.
- Home: Move to the beginning of a row.
- Ctrl + Home: Move to the beginning of a worksheet.
- Ctrl + End: Move to the last cell with content.

Formatting Shortcuts

- Ctrl + B: Apply or remove bold formatting.
- Ctrl + I: Apply or remove italic formatting.
- Ctrl + U: Apply or remove underlining.
- Ctrl + 1: Open the Format Cells dialog box.
- Alt + E, S, V: Paste special.

Data Management Shortcuts

- Ctrl + T: Create a table.
- Ctrl + L: Create a filter.
- Ctrl + Shift + L: Toggle filters.
- Alt + D, P: Create a PivotTable.

- Ctrl + Shift + "+": Insert new cells, rows, or columns.
- Ctrl + "-": Delete selected cells, rows, or columns.

Formula Shortcuts

- F2: Edit the active cell.
- Ctrl + ` (grave accent): Switch between displaying cell values and formulas.
- Shift + F3: Insert a function.
- Ctrl + Shift + Enter: Enter a formula as an array formula.

Thank You!