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# Excel Essentials

## Text to Columns

### Objective

Learn to split data from a single cell into multiple columns in Excel using the 'Text to Columns' feature.

### Steps

1. Locate your data: Ensure your data is in one cell, like A1, and separated by commas or another delimiter.
2. Access the 'Text to Columns' feature: Go to the 'Data' tab on the Excel ribbon. Look for the 'Text to Columns' option, usually found in the 'Data Tools' group.
3. Select your data: Click on the cell with your data (e.g., A1) to select it. If your data spans multiple rows, select the entire range (e.g., A1:A10).
4. Initiate 'Text to Columns': Click the 'Text to Columns' button. A wizard will open to guide you through the process.
5. Choose the file type: Select the 'Delimited' option when prompted. This choice means that characters like commas, tabs, or other specified delimiters separate your data fields.
6. Set the delimiter: In the next step of the wizard, specify the delimiter that your data uses (e.g., comma). Ensure the corresponding checkbox (e.g., Comma) is ticked. You will see a preview of how your data will appear in separate columns.
7. Format columns (optional): You can optionally set the data format for the resulting columns. For general data types, select the 'General' option. This step allows you to choose the format, like text, date, or number, for each column.
8. Complete the process: Click 'Finish' to execute the split. Your data will now be divided into separate columns based on the chosen delimiter, replacing the original comma-separated list in the cell.

## Cell Formatting

### Objective

Learn how to manipulate the display of data in Excel cells using the 'Format Cells' feature, covering text and number formatting, custom formatting, and date formatting.

### Overview

* Text and Number Formatting
* Custom Formatting
* Date Formatting

### Detailed Steps

#### 1. Text and Number Formatting:

Identify Cell Content: To determine whether a cell contains text or a number, check the formula bar. If the cell is formatted as 'General', it usually contains text. Numbers, on the other hand, may appear with 'Number', 'Currency', or 'Accounting' formats.

Accessing Format Cells: Right-click the cell and select 'Format Cells', or use the shortcut `Ctrl+1`, to open the formatting options.

#### 2. Custom Formatting:

Enhance Readability: Use custom formatting to make large numbers easier to read. For instance, you can format numbers in the thousands, millions, or billions by inserting commas in the custom format field.

Add Text Metrics: To append words like 'million' or 'billion' to the number, include them in quotation marks in the custom format string. For example, a number can be formatted as `#,##0," million"` to display 1,000,000 as '1 million'.

Adjust Decimal Places: You can also specify the number of decimal places to show by adding `.0` or `.00` after the comma in the custom format.

#### 3. Date Formatting:

Understand Default Settings: Excel uses your computer’s regional settings for date formats. To manually change a date's display format, use the 'Format Cells' dialog.

Custom Date Formats: In the 'Format Cells' dialog, you can create custom date formats using placeholders like `d` for the day, `ddd` for the weekday, `m` for the month, `mmm` for the abbreviated month, and `y` for the year.

Examples: To display a date as "Monday, 01 January 2023", use the custom format `dddd, dd mmmm yyyy`.

## Autofill and Flash Fill

### Objective

Learn to efficiently use Excel's Autofill and Flash Fill features for quick data entry and pattern-based data extraction.

### Introduction to Autofill

- Purpose: Autofill helps create sequences of numbers, dates, or alphanumeric data by extending the pattern from an initial cell or cells.

- Usage: Simply select a cell or a range of cells, then drag the fill handle (a small square at the bottom-right corner of the selection) down or across to fill the series.

### Using Autofill

1. Creating Sequences: To generate a sequence (like dates, numbers, or days), enter the starting value(s) and drag the fill handle to extend the series. Excel will automatically continue the pattern based on the initial entry.

2. Options in Autofill: Autofill can replicate the exact value, continue a series, or copy values without formatting. After dragging to fill, a small button appears allowing you to choose how to fill the series (e.g., 'Copy Cells', 'Fill Series', 'Fill Formatting Only').

### Introduction to Flash Fill

- Purpose: Flash Fill is used to split or format data based on an example you provide, without needing formulas.

- Functionality: It recognizes patterns in your data and automatically completes the rest of the entries.

### Using Flash Fill

1. Extracting Data: For example, to separate first names from a column of full names, type the first name manually in an adjacent cell. Press `Ctrl + E` to activate Flash Fill, and Excel will fill the remaining cells with first names extracted from the full names.

2. Pattern Recognition: Flash Fill works best when there is a clear and consistent pattern in the data. It's ideal for extracting or formatting data like dates, phone numbers, and other structured text.

## Data Validation and Named Ranges

### Objective

Learn how to utilize Data Validation and Named Ranges in Excel to create controlled input fields like dropdown lists and manage cell references efficiently.

### Introduction to Named Ranges

- Purpose: A Named Range allows you to assign a memorable name to a cell or range of cells.

- Benefits: Improves formula readability, simplifies cell reference management, and facilitates data validation.

### Creating a Named Range

1. Select the Range: Identify and select the cells you want to name (e.g., a list of courses).

2. Define the Name: Go to the 'Formulas' tab, click 'Name Manager', and then 'New'. Enter a name for the range (e.g., `CourseList`) and confirm the cell range it refers to.

### Using Named Ranges in Data Validation

1. Access Data Validation: Select the cell or cells where you want the dropdown list to appear. Go to the 'Data' tab and click 'Data Validation'.

2. Set the Validation Criteria: In the Data Validation dialog box, set 'Allow' to 'List'. In the 'Source' field, enter the name of your Named Range (e.g., `=CourseList`). This links the dropdown list to the cells in the Named Range.

### Managing Named Ranges

Use the 'Name Manager' under the 'Formulas' tab to edit, delete, or review existing Named Ranges. It provides a central location to manage all named references in your workbook.

### Implementing Data Validation

- Purpose: Data Validation restricts the type of data or the values that users can enter into a cell.

- Setup: Apart from lists, you can set validation criteria for data types, value ranges, and custom formulas.

## Cell References

### Objective

Master the use of cell references in Excel, including relative, absolute, and mixed references, to ensure accurate calculations in your spreadsheets.

### Understanding Cell References

- Relative References: By default, Excel uses relative references, which change when a formula is copied to another cell.

- Absolute References: Use absolute references to keep a cell constant in your formulas, regardless of where they are copied.

- Mixed References: Combine the flexibility of relative and the consistency of absolute references by locking either the row or the column.

#### Example Scenario: Calculating Sales Price

You have a cost price in cell A1 and a profit rate in B1. To calculate the sales price in C1, you might use a formula like `=A1 + (A1 \* B1)`.

### Using Relative References

1. Default Behavior: When you drag the formula in C1 down to C2, it changes to `=A2 + (A2 \* B2)`, automatically adjusting the references based on the new location.

### Introducing Absolute References

1. Locking Cells in Formulas: To keep the profit rate in B1 constant, modify the formula in C1 to `=A1 + (A1 \* $B$1)`. Adding dollar symbols before the column and row of B1 (`$B$1`) makes it an absolute reference.

2. Copying Formulas: Now, when you drag the formula down, the reference to B1 remains constant, preventing incorrect calculations.

### Using Mixed References

1. Locking Rows or Columns: If you want to lock only the row or the column, use a mixed reference like `$A1` (locks column A) or `A$1` (locks row 1).

2. Application: This is useful when you want to maintain a constant reference to a specific row or column across multiple formulas.

### Toggling Reference Types with F4

Pressing `F4` (or `Fn + F4` on some keyboards) while editing a formula cycles through the reference types: relative, absolute, and mixed.

## Excel Tables

### Objective

Learn how to transform raw data into an intelligent Excel table to streamline formula usage and enhance data analysis.

### Converting Raw Data into an Excel Table

1. Selection: Highlight the data range you want to convert, including any headers.

2. Conversion: Go to the 'Insert' tab and click 'Table', or use the shortcut `Ctrl + T`. Ensure the 'My table has headers' checkbox is selected to recognize the first row as headers.

### Naming the Table

Assign a relevant name to your table under the 'Table Design' tab to make references easier and formulas more understandable.

### Table Formatting and Structure

Excel tables automatically adjust formatting when new rows or columns are added, maintaining a consistent and dynamic layout.

### Using Formulas with Table Data

1. Simplified Referencing: Within a table, you can reference columns by their names, which is more intuitive than using cell ranges.

For example, instead of `=SUM(A2:A100)`, you can use `=SUM(Table1[ColumnName])`.

2. Formula Integration: When you enter a formula in one row, Excel automatically fills it down the entire column within the table, ensuring consistency and accuracy.

### Calculating Aggregates with Table Data

Use the built-in functionality of Excel tables to calculate aggregates like total orders, quantity sold, sales, and profit. Formulas in tables are integrated with the table’s context, allowing for dynamic calculations as the data changes.

# Text Functions

## Basic Text Functions

Learn how to use six basic text functions in Excel to clean and standardize data, enhancing readability and consistency.

### Concatenate Function

Combines multiple text strings into one.

Usage: `=CONCATENATE(text1, [text2], ...)` or `=text1 & text2 & ...`.

Example: `=A1 & " " & B1` to combine first and last names.

### Trim Function

Removes extra spaces from text except for single spaces between words.

Usage: `=TRIM(text)`.

Example: `=TRIM(A1)` to remove extra spaces in cell A1.

### Len Function

Counts the number of characters in a text string, including spaces.

Usage: `=LEN(text)`.

Example: `=LEN(A1)` to find the length of the string in cell A1.

### Proper Case Function

Converts text to title case.

Usage: `=PROPER(text)`.

Example: `=PROPER(A1)` to convert text in cell A1 to title case.

### Lowercase Function

Converts all characters in a text string to lowercase.

Usage: `=LOWER(text)`.

Example: `=LOWER(A1)` to convert text in cell A1 to lowercase.

### Uppercase Function

Converts all characters in a text string to uppercase.

Usage: `=UPPER(text)`.

Example: `=UPPER(A1)` to convert text in cell A1 to uppercase.

## LEFT and RIGHT

### Objective

Learn to extract specific data from cells in Excel using the `LEFT` and `RIGHT` functions, ideal for parsing strings where relevant information is positioned at the start or end of the text.

### Introduction to LEFT and RIGHT Functions

- LEFT Function: Extracts a specified number of characters from the beginning (left side) of a text string.

- RIGHT Function: Extracts a specified number of characters from the end (right side) of a text string.

### Parameters for LEFT and RIGHT Functions

Both functions require two arguments:  
1. The text string or cell reference from which to extract the characters.  
2. The number of characters to extract.

### Practical Example: Extracting Employee ID

Assume you have an employee ID that is either at the beginning or end of the text in a cell.

Using the LEFT Function  
1. Syntax: `=LEFT(text, num\_chars)`  
2. Example: To extract a five-character ID from the beginning of cell A1, use `=LEFT(A1, 5)`.

Using the RIGHT Function  
1. Syntax: `=RIGHT(text, num\_chars)`  
2. Example: To extract a five-character ID from the end of cell A1, use `=RIGHT(A1, 5)`.

### Application Scenarios

These functions are extremely useful for data cleaning tasks where you need to isolate specific portions of a text string, such as codes, names, or numerical data, that are consistently positioned within a cell.

## MID

### Objective

Learn how to use the `MID` function in Excel to extract data from the middle of a text string in a cell, perfect for situations where the required data is not at the beginning or end.

### Understanding the MID Function

The `MID` function is designed to pull a specific number of characters from a text string, starting at any point within the string. This function is essential for extracting data located anywhere within a cell, not just at the beginning or end.

### Parameters for the MID Function

1. Text: The cell or string from which to extract the characters.

2. Start\_num: The position in the text string where the extraction should begin.

3. Num\_chars: The number of characters to extract from the text string starting at the start\_num.

#### Example: Extracting an Employee ID

Suppose you have a string in cell A1, and you need to extract a five-character employee ID starting from the fourth character.

### Using the MID Function

1. Syntax: `=MID(text, start\_num, num\_chars)`

2. Example: To extract the ID from cell A1, starting at the fourth character, use `=MID(A1, 4, 5)`.

### Application Tips

Determine the Starting Point: Carefully identify where the desired data segment begins within the string.Count the Characters: Ensure you know how many characters you need to extract to avoid cutting off important information.

## Substitute

### Objective

Discover how to use Excel's `SUBSTITUTE` function to replace specific text within a cell, streamlining data cleaning and formatting.

### Overview of the SUBSTITUTE Function

The `SUBSTITUTE` function is used to replace occurrences of a specified substring within a text string. It can target and replace all instances of the substring or just a specific occurrence, based on the parameters provided.

### Parameters for the SUBSTITUTE Function

1. Text: The cell or string containing the text you want to replace.
2. Old\_text: The text within the cell that you wish to replace.
3. New\_text: The text that will replace the old text.
4. Instance\_num (optional): The specific occurrence of the old text you want to replace. If omitted, all instances of the old text are replaced.

### Practical Examples

1. Removing All Dashes: To remove all dashes from cell A1, use `=SUBSTITUTE(A1, "-", "")`. This formula replaces each dash in A1 with nothing, effectively deleting them.

2. Replacing the First Instance of '00': To replace only the first instance of double zeros in cell A1 with a plus sign, use `=SUBSTITUTE(A1, "00", "+", 1)`. The fourth parameter (1) specifies that only the first occurrence of "00" should be replaced with "+".

### Understanding the Instance Number Parameter

The `Instance\_num` parameter is crucial for targeting specific occurrences of the old text. For example, `=SUBSTITUTE(A1, "e", "i", 2)` will replace the second instance of "e" in A1 with "i". The replacement is not cumulative; specifying an instance number targets that specific occurrence only.

# Conditional and Conditional Aggregates

Learn how to utilize Excel's IF function and other decision-making tools to automate analysis and categorize data effectively.

### IF Function

Performs logical tests and returns values based on the outcome.

Usage: `=IF(logical\_test, value\_if\_true, value\_if\_false)`.

Example: `=IF(A1 >= AVERAGE(B1:B10), "High", "Low")` to assign a status based on revenue.

### ROUNDUP Function

Rounds a number up to the nearest specified multiple.

Usage: `=ROUNDUP(number, num\_digits)`.

Example: `=ROUNDUP(AVERAGE(A1:A10), 0)` to round up average revenue.

### Dynamic Changes

Excel functions update dynamically with data changes, ensuring that decisions and categorizations remain current with the latest data inputs.

## SUMIF

### Objective

Learn to use the `SUMIF` function in Excel to sum values based on a specific condition, ideal for aggregating data like daily sales transactions.

### Data Overview

The data consists of a sales transaction sheet with columns for dates and corresponding revenue values, where some dates have multiple transactions.

### Goal

Calculate the total revenue for each date, accounting for multiple transactions on the same date.

### Using the SUMIF Function

1. Function Overview: The `SUMIF` function sums up values in a range based on one condition.

Syntax: `=SUMIF(range, criteria, [sum\_range])`

2. Procedure: Specify the range (date column), criteria (individual date), and sum range (revenue column). Execute the function to add up revenues matching the specified date.

#### Example

To calculate total revenue for '2023-03-25', with dates in column A and revenues in column B, use `=SUMIF(A:A, "2023-03-25", B:B)`. This sums all revenues in B where the date in A is '2023-03-25'.

#### Result

The `SUMIF` function accurately provides the total revenue for each date, effectively aggregating values from multiple transactions on the same date.

# Look Up Functions

## VLOOKUP

### Objective

Learn how to use the `VLOOKUP` function in Excel to populate missing data from another sheet or workbook based on a common identifier.

### 1. Data Context

The primary dataset is a sales transactions sheet with incomplete region information. A secondary dataset, the sales rep master sheet, contains the necessary region data.

### 2. Goal

To complete the region column in the sales transactions sheet using the corresponding data from the sales rep master sheet.

### 3. VLOOKUP Function

The `VLOOKUP` function is ideal for this task as it searches for a value in a vertical column and returns a related value from a specified column.

Syntax: `=VLOOKUP(lookup\_value, table\_array, col\_index\_num, range\_lookup)`

### 4. Procedure

Specify the lookup value, table array, column index number, and range lookup. Execute the function to fill in the region data that matches the sales representative name.

### 5. Result

The `VLOOKUP` function accurately populates the missing region data in the sales transactions sheet, based on the sales representative's name.

# Basic Charts

Learn to create and customize Pie, Bar, and Line charts in Excel to visually represent data, enhancing understanding and presentation.

## 1. Pie Chart

Best for showing the proportion of categories as part of a whole.

### Steps

* Select the data you want to represent in the pie chart.
* Go to the 'Insert' tab, click on 'Insert Pie or Doughnut Chart', and choose your preferred pie chart style.
* Customize the chart with labels, colors, and legends as needed.

## 2. Bar Chart

Ideal for comparing quantities across different categories.

### Steps

* Highlight the data that you want to illustrate with a bar chart.
* Click on the 'Insert' tab, select 'Bar Chart', and pick the type of bar chart you want to use (horizontal, vertical, stacked, etc.).
* Adjust the chart's design, layout, and format for better clarity and aesthetics.

## 3. Line Chart

Suitable for displaying trends over time or continuous data.

### Steps

* Select the data range for your line chart, including dates or time on one axis and the corresponding values on the other.
* Navigate to the 'Insert' tab, choose 'Line Chart', and select the line chart variant that fits your data.
* Customize the chart with titles, axis labels, and other elements to enhance understanding.

## Customization Tips

Use legends and labels for clear data representation and to aid in data interpretation. Select colors that ensure good contrast and readability. Adjust the data series to highlight key trends or differences.