

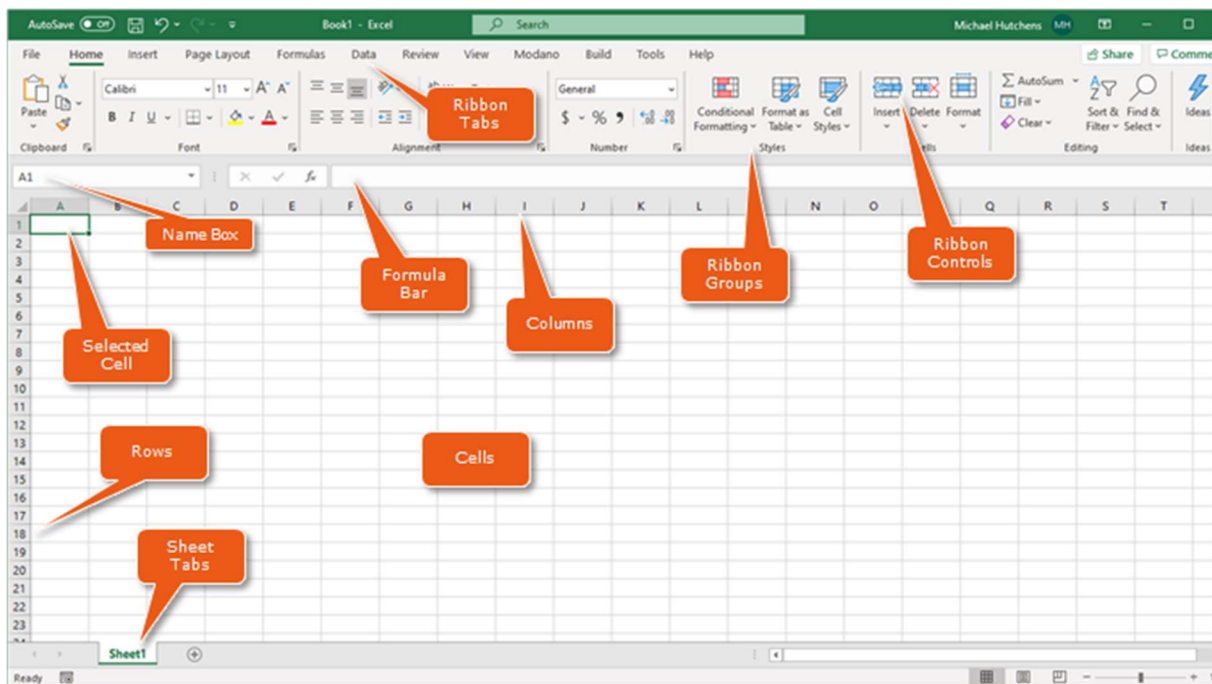
Microsoft Excel

Chapter 1: Introduction to Excel

This chapter introduces the fundamentals of Excel Office 365, helping users understand the core elements of the Excel interface and essential navigation features.

1.1 Understanding the Excel Interface

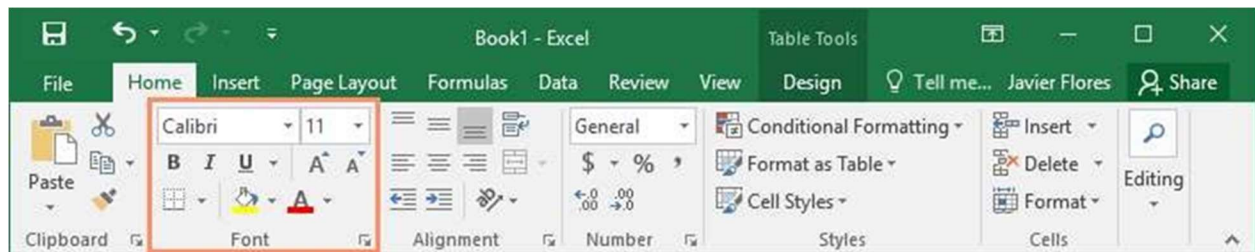
- **Excel Workspace Overview:**
 - When you open Excel, you are greeted with a blank workbook consisting of rows and columns. You can customize this interface to suit your work style.
 - Familiarize yourself with the key elements: the **Quick Access Toolbar**, **Ribbon**, **Name Box**, **Formula Bar**, and **Worksheet Tabs**.
- **Key Sections of the Interface:**
 - **Ribbon:** Contains tabs like *Home*, *Insert*, *Data*, *Review*, and *View*, each holding groups of related commands.
 - **Worksheet Tabs:** Switch between different worksheets using these tabs at the bottom of the interface.



1.2 Workbook and Worksheet Overview

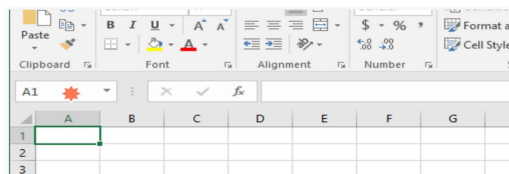
- **Workbooks:** An Excel file is referred to as a workbook, which may contain one or more **Worksheets** (individual sheets). The workbook holds all data and is saved as a .xlsx file by default.
- **Worksheets:**
 - Each worksheet consists of a grid made up of **cells** arranged in **columns** (lettered A, B, C, etc.) and **rows** (numbered 1, 2, 3, etc.).
 - Worksheets can be renamed, deleted, and rearranged as needed.

1.3 Ribbon, Tabs, and Toolbars



- **The Ribbon:**
 - The **Ribbon** organizes Excel's features into tabs. Each tab is organized into groups that contain related functions.
 - For example, the **Home** tab contains commands for formatting, alignment, and data entry tools.
- **Customizing the Ribbon:**
 - Users can customize the Ribbon to access their most-used features more easily by right-clicking on it and choosing **Customize the Ribbon**.

1.4 Cells, Rows, and Columns



- **Understanding Cells:**
 - **Cells** are the basic units where data is entered. Each cell is identified by its **cell reference**, a combination of the column letter and row number (e.g., A1).

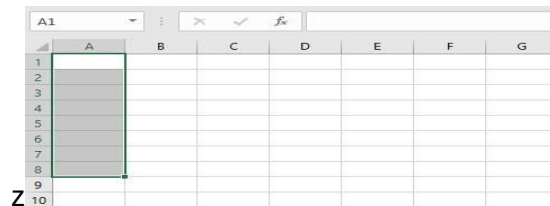
- **Rows and Columns:**
 - **Columns** are vertical and identified by letters, while **Rows** are horizontal and identified by numbers. Together, they form the grid where you input your data.
-

1.5 Basic Navigation and Data Entry

- **Navigating the Worksheet:**
 - Use the arrow keys to move between cells, or click on a specific cell to select it.
 - Use **Ctrl + Arrow Keys** to jump to the edge of data regions.
 - **Scroll bars** on the right and bottom edges help navigate large datasets.
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1.6 Entering and Editing Data

- **Data Entry:**
 - Select a cell and type data directly into it. Press **Enter** to confirm, or **Tab** to move to the next cell.
- **Editing Data:**
 - Double-click a cell to edit the content, or press **F2** to enter edit mode.



1.7 Basic Keyboard Shortcuts

Here are some useful shortcuts for quick navigation and data entry:

1. **Ctrl + N:** New workbook
2. **Ctrl + O:** Open workbook
3. **Ctrl + S:** Save workbook
4. **Ctrl + P:** Print workbook
5. **Ctrl + W:** Close workbook
6. **Ctrl + F4:** Close Excel application window
7. **Ctrl + Z:** Undo action

8. **Ctrl + Y**: Redo action
9. **Ctrl + C**: Copy selected cells
10. **Ctrl + X**: Cut selected cells
11. **Ctrl + V**: Paste copied or cut cells
12. **Ctrl + A**: Select all cells in the current sheet
13. **Ctrl + D**: Fill down
14. **Ctrl + R**: Fill right
15. **Ctrl + F**: Open Find dialog
16. **Ctrl + H**: Open Replace dialog
17. **Ctrl + K**: Insert hyperlink

Navigation Shortcuts

18. **Ctrl + Arrow Key**: Move to the edge of data region
19. **Ctrl + Home**: Move to the beginning of the worksheet (A1 cell)
20. **Ctrl + End**: Move to the last cell with content
21. **Page Up**: Move up one screen
22. **Page Down**: Move down one screen
23. **Alt + Page Up**: Move left one screen
24. **Alt + Page Down**: Move right one screen

Editing Shortcuts

25. **F2**: Edit the active cell
26. **Ctrl + Shift + L**: Toggle filters on or off
27. **Ctrl + Shift + "+"**: Insert new cells, rows, or columns
28. **Ctrl + "-"**: Delete cells, rows, or columns
29. **Alt + E, S, V**: Paste special dialog
30. **Ctrl + Shift + 1**: Apply number format (with two decimal places, thousands separator, and minus sign for negative values)
31. **Ctrl + Shift + \$**: Apply currency format
32. **Ctrl + Shift + %**: Apply percentage format

Formatting Shortcuts

33. **Ctrl + B**: Bold text
34. **Ctrl + I**: Italicize text
35. **Ctrl + U**: Underline text
36. **Ctrl + 5**: Strikethrough text
37. **Alt + E, S, F**: Open Format Cells dialog
38. **Ctrl + 1**: Open Format Cells dialog directly

Formulas and Functions Shortcuts

39. **Ctrl + Shift + Enter**: Enter an array formula
40. **F4**: Repeat last action (useful for adding dollar signs to formulas)

- 41. **Ctrl + Shift + T**: Insert function
- 42. **Ctrl + A**: Open the Function Arguments dialog
- 43. **Alt + M, A, F**: Toggle Formula Auditing Mode

Data Management Shortcuts

- 44. **Ctrl + T**: Create a table from selected data
- 45. **Ctrl + Shift + U**: Expand or collapse the formula bar
- 46. **Alt + D, F, F**: Apply filter to selected range
- 47. **Ctrl + Shift + "+"**: Insert new rows or columns
- 48. **Ctrl + Shift + K**: Group selected rows or columns
- 49. **Ctrl + Shift + J**: Ungroup selected rows or columns

Miscellaneous Shortcuts

- 50. **Alt + F8**: Open the Macro dialog box
-

Chapter 2: Functions

This chapter focuses on Excel functions that are essential for managing logistics data effectively. By mastering these functions, users will be able to manipulate text, perform logical tests, look up data efficiently, and work with dates and times.

2.1 Text Functions

Text functions allow you to manipulate and format text data within cells, making it easier to extract and organize information.

- **CONCATENATE:**
 - Combines multiple text strings into one.
 - Example: =CONCATENATE(A1, " ", B1) combines the text from cells A1 and B1 with a space between them.
 - **LEFT:**
 - Extracts a specified number of characters from the start of a text string.
 - Example: =LEFT(A1, 3) returns the first three characters of the text in cell A1.
 - **RIGHT:**
 - Extracts characters from the end of a text string.
 - Example: =RIGHT(A1, 2) returns the last two characters of the text in A1.
 - **MID:**
 - Extracts a specific number of characters from a text string, starting at any position.
 - Example: =MID(A1, 2, 3) extracts three characters starting from the second character in A1.
 - **LEN:**
 - Returns the number of characters in a text string.
 - Example: =LEN(A1) gives the total number of characters in cell A1.
 - **FIND:**
 - Locates the position of a specific character or substring within a text string.
 - Example: =FIND("@", A1) returns the position of the "@" character in the email address in A1.
-

2.2 Logical Functions

Logical functions are used to perform comparisons and return results based on true or false conditions.

- **IF:**

- **XLOOKUP:**
 - A more flexible replacement for VLOOKUP. It searches a range for a match and returns a value from another range.
 - Example: =XLOOKUP(A1, B2:B10, C2:C10) searches for A1 in the range B2 and returns the corresponding value from C2

2.4 Date and Time Functions

Date and time functions are useful for performing calculations involving dates, such as tracking deliveries, deadlines, and schedules.

- **TODAY:**
 - Returns the current date.
 - Example: =TODAY() returns today's date in the format set in your system.
 - **NOW:**
 - Returns the current date and time.
 - Example: =NOW() gives the exact date and time at the moment the function is used.
 - **DATE:**
 - Creates a date from individual year, month, and day values.
 - Example: =DATE(2024, 12, 25) returns December 25, 2024.
 - **DATEDIF:**
 - Calculates the difference between two dates.
 - Example: =DATEDIF(A1, B1, "D") returns the number of days between the dates in A1 and B1.
 - **NETWORKDAYS:**
 - Returns the number of working days between two dates, excluding weekends and optional holidays.
 - Example: =NETWORKDAYS(A1, B1) calculates the number of workdays between the dates in A1 and B1.
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Chapter 3: Data Management and Basic Analysis

This chapter will guide you through managing large datasets using Excel's powerful table tools, sorting and filtering functions, and basic data visualization techniques through charts and graphs. These tools are crucial for organizing logistics data effectively.

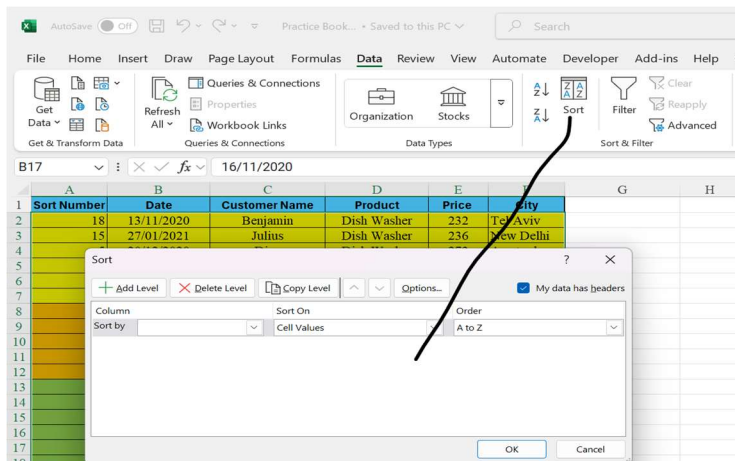
3.1 Using Tables

Tables in Excel are a powerful feature for managing data, allowing you to sort, filter, and analyze information more easily.

- **Creating Tables:**
 - To convert a range of data into a table, select your dataset and click on **Insert > Table** or press **Ctrl + T**.
 - Ensure the checkbox for "My table has headers" is selected if your dataset has column titles.
 - **Formatting Tables:**
 - After creating a table, you can format it using the **Table Tools** under the **Design** tab.
 - Apply **Table Styles** for different visual looks, and use the **Banded Rows** or **Banded Columns** option for better readability.
 - Use the **Total Row** option under Table Tools to automatically add a row at the bottom for quick calculations (e.g., Sum, Average).
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3.2 Sorting and Filtering Data

Sorting and filtering allow you to organize and analyze your logistics data quickly.



- **Sorting Data:**
 - To sort data, select the column you want to sort by, and go to **Data > Sort**.
 - You can sort alphabetically (A-Z, Z-A) or numerically (smallest to largest, largest to smallest).
 - For advanced sorting, use **Sort by Multiple Columns** to organize by more than one field (e.g., sort by country and then by invoice number).
 - **Filtering Data:**
 - Filtering is useful for displaying only the data you need without altering the dataset.
 - Click on any column header and select **Data > Filter**. This adds filter arrows to the headers.
 - You can then filter by specific values, ranges, or criteria (e.g., showing only data from a particular country or time period).
-

3.3 Basic Charts and Graphs

Visualizing data is a critical part of analysis, helping you identify patterns and trends quickly. This section covers the creation and formatting of basic charts in Excel.

3.4 Creating Bar, Line, and Pie Charts

- **Bar Charts:**
 - Bar charts are ideal for comparing categories of data.
 - Select the data range you want to visualize, then go to **Insert > Bar Chart**.
 - Choose from different styles like 2D, 3D, or stacked bar charts based on your needs.
- **Line Charts:**
 - Line charts are best for showing trends over time.
 - Select your data, then choose **Insert > Line Chart**. This chart will display data points connected by straight lines, showing progression over a timeline.
- **Pie Charts:**
 - Pie charts display proportions of a whole and are great for visualizing the percentage breakdown of categories.
 - Select the range of data and click **Insert > Pie Chart** to display the proportion of each segment (e.g., percentage of goods shipped to various countries).

CHART TYPE



3.5 Modifying and Formatting Charts

Once you create a chart, Excel allows you to modify and format it for better clarity and presentation.

- Modifying Charts:**
 - Click on any chart element (e.g., bars, lines, pie slices) to modify its appearance.

- Use the **Chart Tools > Design** and **Format** tabs to change the chart type, adjust colors, and rearrange data.
- **Adding Labels and Titles:**
 - You can add axis titles, data labels, and chart titles by using the **Chart Elements** button (the "+" icon next to the chart).
 - Labeling charts helps in clearly identifying what each axis or data point represents.
- **Formatting Charts:**
 - Change the chart's overall look by using **Chart Styles** under the **Design** tab.
 - Modify individual chart components (e.g., the plot area, chart area, or gridlines) under the **Format** tab for precise formatting.

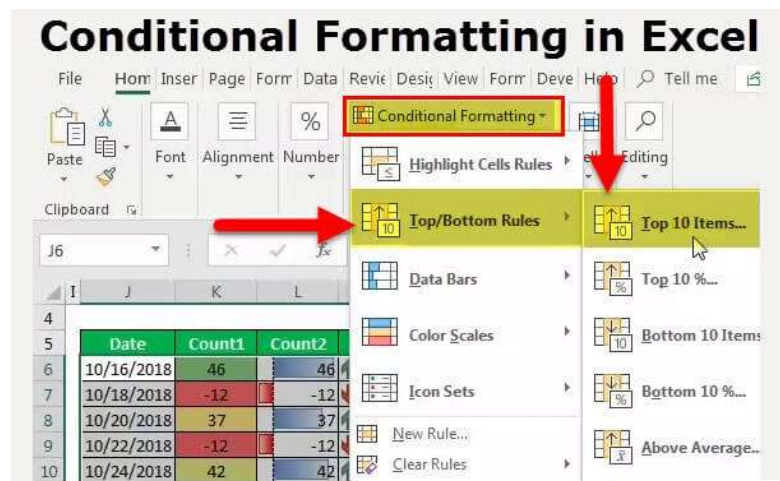
Chapter 4: Advanced Data Formatting and Analysis Tools

In this chapter, we dive into more advanced tools for data formatting and analysis. These techniques are vital for handling complex datasets, especially when managing logistics data. You will learn advanced conditional formatting, charting techniques, and powerful data analysis tools like What-If Analysis.

4.1 Advanced Conditional Formatting

Conditional formatting allows you to automatically format cells based on their values, making it easier to highlight trends, outliers, or important data points.

- **Creating Advanced Conditional Formatting Rules:**
 - To apply conditional formatting, select your data and go to **Home > Conditional Formatting**.
 - Use **New Rule** for custom conditions, such as applying different colors for values above or below a certain threshold.
- **Highlighting Top/Bottom Values:**
 - Highlight top 10%, bottom 10%, or any specified number of highest or lowest values.
 - Example: Highlight orders where the quantity exceeds 100 units by setting a rule like **Cell Value > 100**.
- **Using Formulas in Conditional Formatting:**
 - Conditional formatting can be based on formulas for more complex conditions.
 - Example: `=A1="Delivered"` can apply a green fill to all cells in column A where the status is "Delivered."



4.2 Advanced Charting Techniques

Advanced charting enables you to combine multiple chart types and add secondary axes, making it easier to visualize different datasets on a single chart.

- **Combo Charts:**
 - A combo chart combines two or more chart types to better display relationships between different data series.
 - Example: Create a **Column-Line Combo Chart** where one series is shown as bars (e.g., quantity of goods) and another as a line (e.g., revenue over time).
 - To create a combo chart, select your data, go to **Insert > Combo Chart**, and choose your preferred combination.
 - **Dual-Axis Charts:**
 - Dual-axis charts are useful when you need to display two different types of data with different scales on the same chart.
 - Example: Plotting the number of shipments on the left axis (primary axis) and shipping costs on the right axis (secondary axis).
 - To add a secondary axis, click on one of the data series, then go to **Chart Tools > Format > Series Options**, and select **Secondary Axis**.
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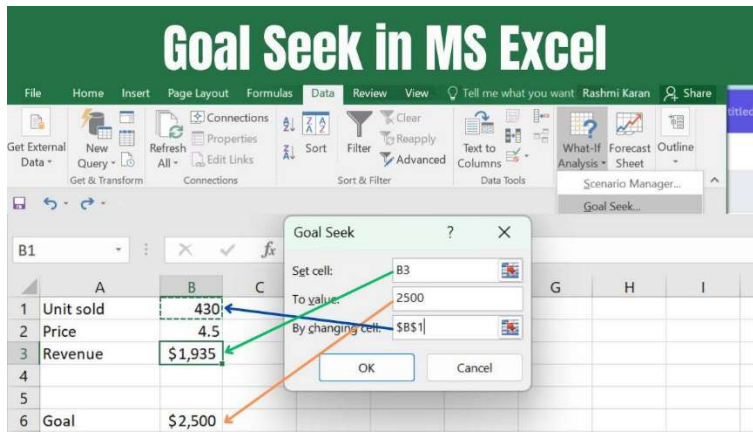
4.3 What-If Analysis Tools

What-If Analysis is an Excel feature that helps you explore different scenarios and calculate possible outcomes based on variable changes.

4.4 Goal Seek

Goal Seek is a tool that finds the input value needed to achieve a specific outcome. It's useful for reverse-engineering a result.

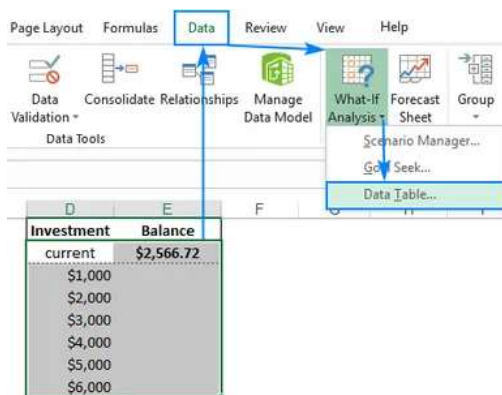
- **How to Use Goal Seek:**
 - Suppose you know the desired profit but need to figure out how much you need to sell to reach that target.
 - Go to **Data > What-If Analysis > Goal Seek**.
 - Set the "Set Cell" to the target cell (e.g., profit), the "To Value" to the target value (e.g., \$10,000), and the "By Changing Cell" to the variable (e.g., units sold).
- **Example:** If you want a specific profit of \$5,000, but you need to know how many units of product to sell, Goal Seek helps find that answer by adjusting the number of units.



4.5 Data Tables

Data Tables help you analyze how changing one or two variables in your formulas affects the overall result. They are useful for sensitivity analysis in logistics, such as calculating different costs or times for shipments.

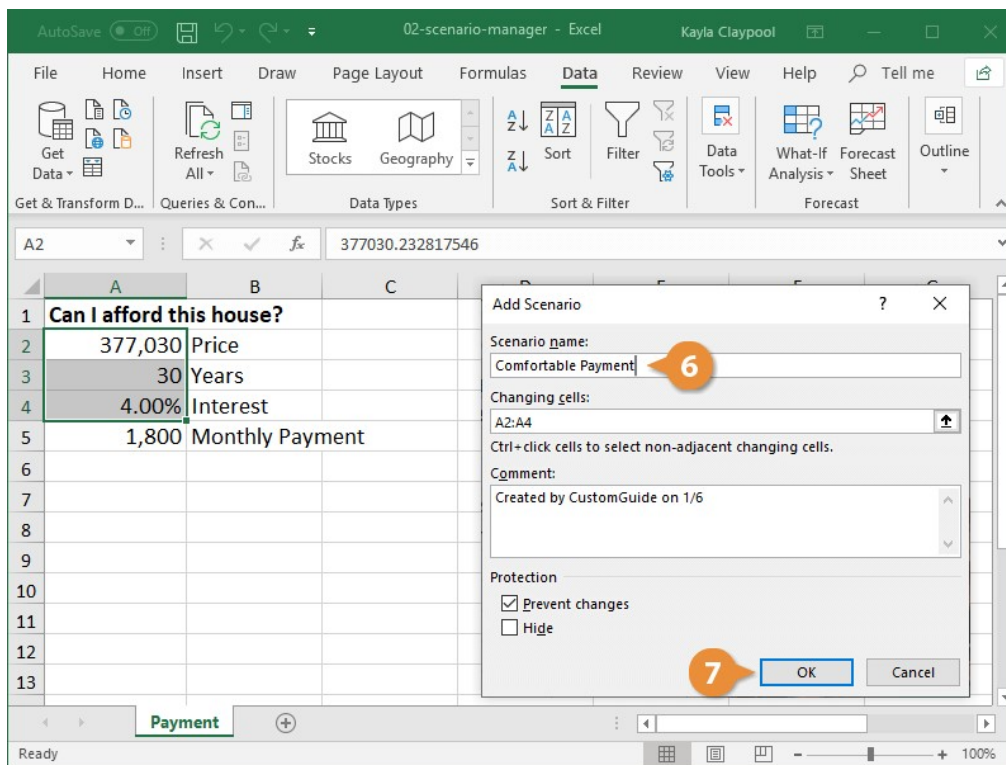
- **One-Variable Data Table:**
 - You can explore how changing one input variable (e.g., quantity shipped) affects the result (e.g., total shipping cost).
 - To create a one-variable data table, go to **Data > What-If Analysis > Data Table** and set the input cell that you want to change.
- **Two-Variable Data Table:**
 - This allows you to see the effect of changing two variables at once (e.g., shipping cost and delivery time).
 - Example: Analyzing how different combinations of shipping quantities and shipping rates impact total cost.



4.6 Scenario Manager

Scenario Manager allows you to store multiple versions of data in a worksheet, which is helpful for planning and forecasting different logistics scenarios.

- **Using Scenario Manager:**
 - Go to **Data > What-If Analysis > Scenario Manager**.
 - Create different scenarios, such as "Best Case" (where shipping costs are low and delivery is quick) and "Worst Case" (where costs are high and delivery is delayed).
 - After defining scenarios, you can switch between them to see how different assumptions affect your data.
- **Scenario Summary:**
 - You can generate a summary report that compares all scenarios side by side. This report helps in presenting different logistics outcomes to stakeholders.



Chapter 5: Data Analysis with PivotTables and PivotCharts

PivotTables and PivotCharts are powerful tools that allow you to summarize and visualize large datasets efficiently. In this chapter, you'll learn how to create PivotTables for data analysis and PivotCharts for clear visual representation.

5.1 Creating PivotTables

PivotTables are useful for summarizing and analyzing data from large datasets, such as tracking shipments, delivery statuses, or customer orders. They allow you to quickly rearrange and filter data to focus on key metrics.

- **Steps to Create a PivotTable:**
 1. Select your dataset, then go to **Insert > PivotTable**.
 2. Choose where you want the PivotTable to appear (e.g., a new worksheet or an existing one).
 3. Drag and drop fields into the **Rows**, **Columns**, **Values**, and **Filters** areas in the PivotTable Field List.
 - **Rows:** This area organizes your data by row (e.g., countries, product categories).
 - **Columns:** Adds column headings to break down data by different categories.
 - **Values:** Displays the data you want to analyze (e.g., total quantity, revenue).
 - **Filters:** Allows filtering the data (e.g., filtering by year, customer type).

Years	2015				
Sum of Revenue	Column Labels	Qtr1	Qtr2	Qtr3	Qtr4
Australia		£780,000	£829,421	£1,692,631	£2,410,287
Canada		£102,944	£88,415	£607,908	£932,687
France		£239,343	£268,026	£597,104	£773,455
Germany		£220,384	£297,613	£632,978	£780,116
United Kingdom		£255,752	£253,867	£788,108	£1,186,454
United States		£461,769	£678,789	£2,015,422	£3,130,518

Drag fields between areas

- **Refreshing PivotTables:**
 - After adding new data to your dataset, always update the PivotTable by selecting it and clicking **PivotTable Tools > Analyze > Refresh** to ensure the data is current.
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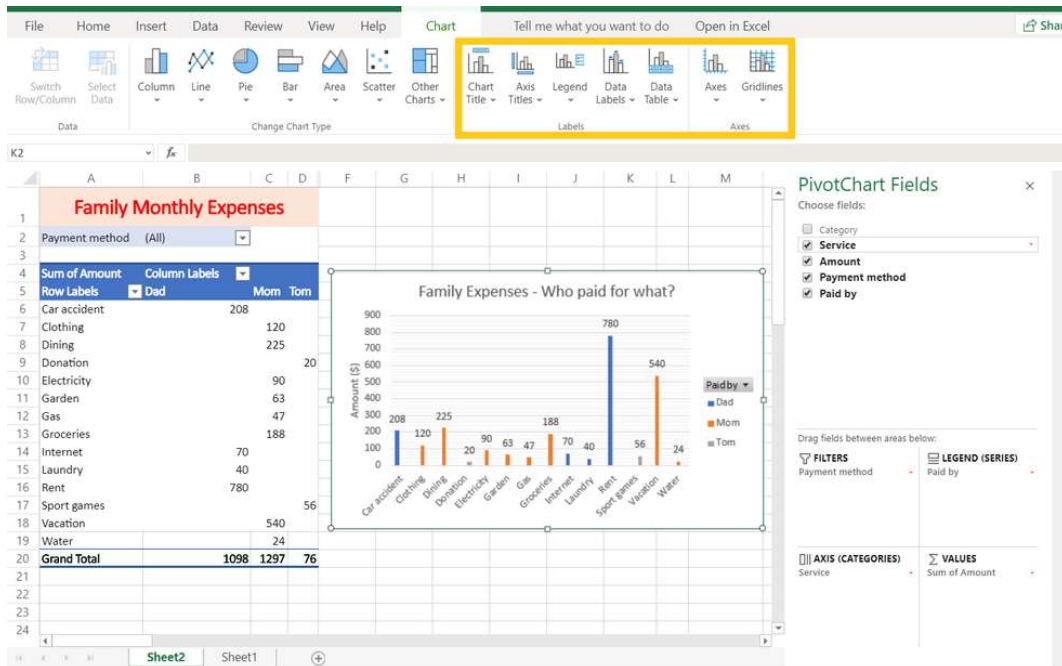
5.2 Grouping, Calculated Fields, and Items

To get more detailed analysis from your PivotTables, you can group data, create calculated fields, and manipulate items within your table.

- **Grouping Data:**
 - You can group data in PivotTables to analyze it by periods (e.g., weeks, months) or ranges (e.g., age groups, sales ranges).
 - Right-click on a row or column value, select **Group**, and choose how you want to group your data. For example, you can group dates by month or quarter for shipment analysis.
 - **Calculated Fields:**
 - Calculated fields allow you to perform custom calculations directly in your PivotTable.
 - To add a calculated field, go to **PivotTable Tools > Analyze > Fields, Items & Sets > Calculated Field**.
 - Example: If you want to calculate the **Profit Margin** by subtracting costs from revenue, you can create a field like `=Revenue - Cost`.
 - **Calculated Items:**
 - Calculated items are used to create custom calculations between items within a field.
 - Example: You can compare shipments to two different countries (e.g., USA and UK) by creating a calculated item like `=USA - UK` to show the difference in the number of shipments.
-

5.3 Creating PivotCharts for Data Visualization

PivotCharts are dynamic charts that can visually represent the data from your PivotTable, allowing you to quickly analyze trends, patterns, and relationships.



- **Steps to Create a PivotChart:**

1. Select any cell within your PivotTable and go to **PivotTable Tools > Analyze > PivotChart**.
2. Choose a chart type (e.g., bar chart, line chart, pie chart) to represent your data.
3. Excel will automatically link the chart to your PivotTable, allowing you to filter and adjust the data using the PivotTable filters.

- **Modifying PivotCharts:**

- After creating a PivotChart, you can modify it just like any other Excel chart.
- Use the **Chart Tools > Design** and **Format** tabs to change the layout, colors, and style of the chart.
- Filter and sort the data directly from the chart by clicking on the filter buttons on the chart axes.

- **Interactivity with PivotCharts:**

- PivotCharts are interactive, meaning that as you change or filter data in your PivotTable, the chart automatically updates to reflect those changes. This makes it a great tool for reporting and presentations.

Chapter 6: Advanced Formulas and Data Models

In this final chapter, we will explore advanced Excel tools like Macros and Power Pivot. These features help you automate repetitive tasks, manage complex data models, and establish relationships between multiple datasets—essential for handling large-scale logistics operations.

6.1 Macros

Macros are a powerful tool for automating repetitive tasks in Excel, saving you time and reducing errors in routine processes like data entry, formatting, or analysis.

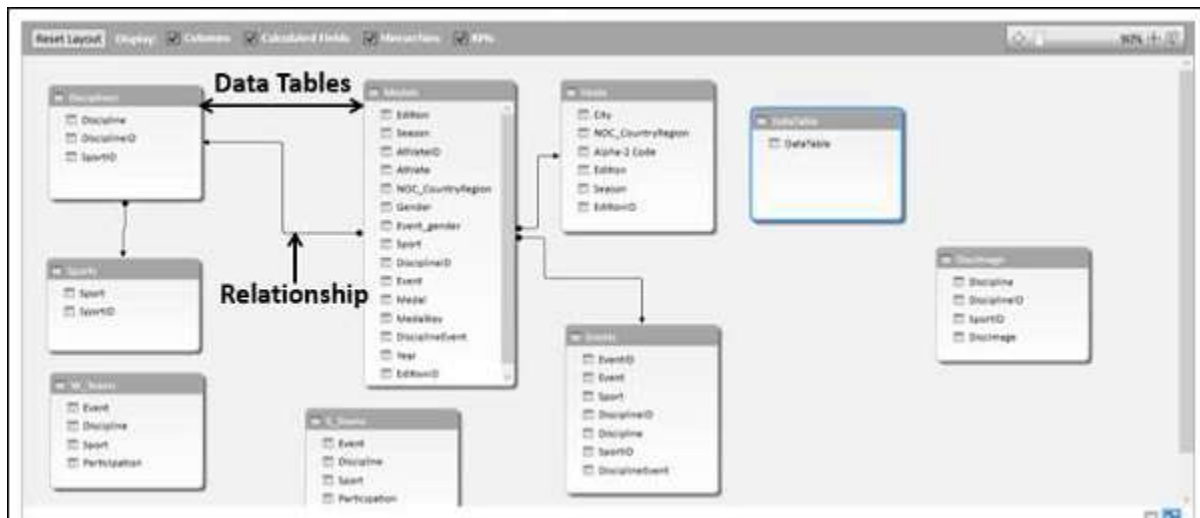
- **Recording and Running Macros:**
 - Macros record your actions in Excel and allow you to replay them automatically.
 - To record a macro, go to **View > Macros > Record Macro**.
 - Give your macro a name, specify where to store it (workbook or personal macro workbook), and if desired, assign a keyboard shortcut.
 - Perform the actions you want to automate, such as formatting, calculations, or chart creation.
 - Once done, click **Stop Recording**.
 - To run the macro, go to **View > Macros > View Macros**, select the macro, and click **Run** or use the assigned shortcut.
 - **Editing Basic Macros:**
 - Macros are written in Visual Basic for Applications (VBA), and you can edit them to customize the automation.
 - To edit a macro, go to **View > Macros > View Macros**, select the macro, and click **Edit**. This opens the **VBA Editor**, where you can modify the code.
 - Example: If your macro selects a specific range of cells, you can modify the code to make it dynamic (e.g., selecting the entire used range instead of a fixed range).
 - **Practical Example:**
 - Automate the monthly generation of shipping reports by recording a macro that sorts data, applies conditional formatting, and generates charts automatically.
-

6.2 Power Pivot

Power Pivot is an advanced Excel feature that allows you to create data models and perform complex data analysis across multiple tables. It is highly useful for logistics data that spans across different sources (e.g., shipment records, customer data, inventory levels).

6.3 Creating Data Models

A data model in Excel is essentially a collection of tables that you can use to create PivotTables or PivotCharts with data from multiple sources. Power Pivot helps you work with larger datasets that go beyond standard Excel limitations.



- **Steps to Create a Data Model:**
 1. Open **Power Pivot** by going to **Data > Manage Data Model**.
 2. Import or link multiple tables from different sources (e.g., Excel sheets, databases).
 3. Once your data is in Power Pivot, you can create relationships between the tables, much like a relational database.
 - **Benefits:**
 - With Power Pivot, you can work with hundreds of thousands of rows of data without slowing down Excel.
 - It enables you to analyze complex logistics scenarios where data is spread across multiple systems or spreadsheets.
-

6.4 Establishing Relationships Between Tables

In Power Pivot, you can establish relationships between different tables, which allows you to create more meaningful reports that pull data from various sources.

- **Creating Relationships:**
 - In Power Pivot, go to **Design > Create Relationship**.
 - Specify the **primary key** (a unique identifier like CustomerID or ShipmentID) and relate it to the corresponding field in another table.
 - Example: You might have a table with **shipment records** and another with **customer details**. By relating these tables using the CustomerID, you can create reports that display shipment information alongside customer data.
 - **Using Relationships in PivotTables:**
 - Once relationships are established, you can use them in PivotTables to pull data from multiple related tables without needing to manually combine datasets.
-

Practical Example: Automating Report Generation with Macros and Power Pivot

- **Automated Reporting:** You can record a macro to automate the entire process of generating monthly logistics reports, such as:
 1. Importing new data.
 2. Refreshing the data model in Power Pivot.
 3. Generating updated PivotTables and PivotCharts.
 4. Formatting and emailing the report to the relevant stakeholders.

Chapter 7: Data Cleaning and Transformation with Power Query

In this chapter, we focus on Power Query, a powerful tool for importing, cleaning, and transforming data from various sources. It is essential for handling logistics data that may come in from different systems, ensuring it's well-structured and ready for analysis.

7.1 Introduction to Power Query

Power Query is an advanced Excel tool used for importing, cleaning, and reshaping large datasets. It allows you to automate data transformation tasks and ensure data consistency.

- **Key Features:**
 - **Data Import:** Load data from various sources, such as Excel files, databases, web pages, and more.
 - **Data Transformation:** Clean, filter, and reshape your data for better analysis.
 - **Automation:** Save and reuse data transformation steps, making future updates easy.
- **Accessing Power Query:**
 - To access Power Query, go to **Data > Get & Transform Data**. This is where you can import and manage your datasets.

The screenshot shows the Power Query ribbon in Microsoft Excel. The ribbon includes tabs for File, Home, Transform, Add Column, and View. The Transform tab is active, showing various options like Close & Load, Refresh Preview, Properties, Advanced Editor, Manage, Choose Columns, Remove Columns, Keep Rows, Remove Rows, Sort, Split Column, Group By, Data Type, Use First Row as Headers, Replace Values, Combine, Manage Parameters, Data source settings, New Source, and Recent Sources. Below the ribbon, a data table is displayed with columns: Row ID, Invoice Sent From UK, Invoice Paid, Shipment Drop Shipped, and Sales. The table contains 20 rows of data. To the right of the table, the Query Settings pane is open, showing the Name 'Exercise 4a - For Reference' and a list of Applied Steps, including Source, Navigation, Promoted Headers, Removed Errors, Changed Type, Replaced Value, Changed Type1, Added Custom, and Changed Type2.

Row ID	Invoice Sent From UK	Invoice Paid	Shipment Drop Shipped	Sales
1	24/10/2019	11/14/2019	11/25/2019	
2	25/10/2019	11/15/2019	11/26/2019	
3	26/10/2019	11/16/2019	11/27/2019	
4	27/10/2019	11/17/2019	11/28/2019	
5	16/05/2019	06/06/2019	06/17/2019	
6	17/05/2019	06/07/2019	06/18/2019	
7	18/05/2019	06/08/2019	06/19/2019	
8	19/05/2019	06/09/2019	06/20/2019	
9	01/11/2019	11/22/2019	12/03/2019	
10	02/11/2019	11/23/2019	12/04/2019	
11	03/11/2019	11/24/2019	12/05/2019	
12	05/11/2019	11/26/2019	12/07/2019	
13	05/11/2019	11/26/2019	12/07/2019	
14	06/11/2019	11/27/2019	12/08/2019	
15	09/11/2019	11/30/2019	12/11/2019	
16	2019-11-11	12/02/2019	12/13/2019	
17	2019-11-14	12/05/2019	12/16/2019	
18	2019-11-17	12/08/2019	12/19/2019	
19	2019-11-18	12/09/2019	12/20/2019	
20				

7.2 Importing Data from Various Sources

Power Query supports importing data from a wide range of sources, allowing you to pull in logistics data from different files, databases, or online services.

- **Importing from Excel:**
 - Go to **Data > Get Data > From Workbook** to import data from another Excel file.
- **Importing from Text/CSV Files:**
 - To import CSV files (e.g., shipment records or inventory logs), go to **Data > Get Data > From Text/CSV**.
- **Importing from Databases:**
 - Power Query can connect directly to databases like SQL Server, Access, or MySQL.
 - Go to **Data > Get Data > From Database** and select your database source.
- **Importing from the Web:**
 - If logistics data is available online, you can connect Power Query to web pages by going to **Data > Get Data > From Web**.

7.3 Data Cleaning and Transformation Techniques

Data cleaning is a crucial step to ensure your imported data is accurate, consistent, and ready for analysis. Power Query makes this process straightforward.

- **Removing Unwanted Columns and Rows:**
 - Once your data is loaded, you can remove irrelevant columns or rows by right-clicking on the column or row header and selecting **Remove**.
- **Filtering Data:**
 - Use Power Query's filter options to exclude unnecessary records. For instance, you can filter out shipments that fall outside a certain date range by using the **Filter** option on date columns.
- **Handling Missing Data:**
 - To clean up missing or incomplete data, you can either remove rows with missing values or replace them with defaults.
 - Use **Home > Remove Rows** to exclude rows with null values, or use **Transform > Replace Values** to fill missing data with placeholder values like "N/A".
- **Splitting and Merging Columns:**
 - Sometimes data is combined in one column (e.g., a "Date and Time" column), but you may need to split it for easier analysis.

- Use **Home > Split Column** to break a column into multiple parts.
 - Alternatively, use **Merge Columns** to combine multiple columns into one, such as combining "First Name" and "Last Name."
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7.4 Combining and Shaping Data with Power Query

One of the key strengths of Power Query is its ability to combine and reshape data from different sources. This is particularly useful in logistics, where you might need to combine shipment data, inventory levels, and customer details.

- **Appending Data:**
 - If you have multiple tables or datasets that share the same structure, you can append them into a single table.
 - Go to **Home > Append Queries**, then select the tables you want to combine.
 - Example: You can append weekly shipment logs into one consolidated dataset for monthly reporting.
 - **Merging Data:**
 - Merging allows you to combine data from different tables based on a common field (e.g., CustomerID or ShipmentID).
 - Go to **Home > Merge Queries** to create a relationship between two datasets, just like a database join.
 - Example: You can merge customer data with shipment records to see which customers received specific shipments.
 - **Transforming Data Types:**
 - Power Query allows you to easily change data types (e.g., converting text to dates or numbers to currency).
 - Select the column, then go to **Transform > Data Type** to adjust as needed.
 - **Pivot and Unpivot:**
 - Use **Pivot** to summarize your data, turning rows into columns for better visibility.
 - Use **Unpivot** to bring data back into a flat, tabular format.
 - Example: Pivot logistics data to summarize shipments by region and unpivot it for more detailed analysis later.
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Practical Example: Cleaning Shipment Data for Analysis

- **Scenario:** You've imported a CSV file of daily shipment records, but it contains irrelevant columns, inconsistent date formats, and missing values.
 1. Use Power Query to import the file.
 2. Remove unnecessary columns like "Extra Info" and "Shipping Agent".

3. Filter out rows with missing delivery dates.
4. Split the "Date and Time" column into separate "Date" and "Time" columns for easier analysis.
5. Merge this data with another dataset containing customer feedback, linking by ShipmentID.

Chapter 8: Creating and Automating Reports

This chapter focuses on how to design professional reports and automate report generation using Excel and Power Query. The goal is to provide port staff with efficient tools for generating consistent, high-quality reports with minimal manual intervention.

8.1 Designing Professional Reports

Creating professional reports is essential for presenting logistics data clearly and effectively to stakeholders. The design of your report should be clean, concise, and easy to follow.

- **Best Practices for Layout and Design:**
 - **Clarity and Simplicity:** Avoid cluttering your reports with excessive details. Focus on the key metrics, such as shipment volumes, delivery times, and customer satisfaction.
 - **Consistent Formatting:** Use consistent fonts, colors, and headings throughout the report to make it visually appealing and easy to read.
 - **Use of Charts and Graphs:** Visual elements like bar charts, line graphs, and pie charts help communicate data more effectively. Ensure that your charts are clearly labeled and color-coded for quick understanding.
 - **Logical Flow:** Organize your data logically—start with a summary or key findings, followed by supporting details. Group similar data together to improve readability.
 - **Steps to Create a Professional Report:**
 1. **Create a Summary Section:** Include a summary of key metrics like total shipments, on-time deliveries, and average delivery times.
 2. **Use Visuals:** Add charts and graphs to represent trends in shipments, performance over time, or comparisons across regions.
 3. **Highlight Key Insights:** Use conditional formatting or data callouts to highlight important data points (e.g., a significant increase in late deliveries).
 4. **Add Interactive Elements:** If relevant, allow users to filter data or view different segments using slicers or drop-down menus.
 5. **Finalize Layout:** Ensure all text, charts, and tables are well-aligned and formatted for easy interpretation.
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8.2 Best Practices for Layout and Design

- **Consistency in Formatting:**
 - Stick to a color palette that aligns with your organization's brand.

- Use uniform font sizes and styles for headers, subheaders, and body text to maintain professionalism.
 - **Readable Data Tables:**
 - If using data tables, ensure they are not overloaded with data. Focus on the most relevant metrics, and consider breaking large tables into smaller, more digestible sections.
 - **Use of White Space:**
 - Proper use of white space around charts, tables, and text helps guide the reader's eyes to the most important information and reduces visual clutter.
 - **Best Placement of Visuals:**
 - Place important visuals like KPIs or trend graphs at the top of the report. More detailed tables or breakdowns can come later in the document.
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8.3 Using Templates

Templates help streamline the process of report creation by providing pre-defined structures, formats, and designs. You can create or download templates that can be reused for multiple reports, ensuring consistency and saving time.

- **Creating a Report Template:**
 - Design your report layout (e.g., header with the report title, company logo, summary section, data tables, charts).
 - Save the report as a template by selecting **File > Save As > Excel Template (.xltx)**.
 - This template can then be reused for monthly or weekly reports.
 - **Using Pre-built Templates:**
 - Excel offers a range of pre-designed templates that can be customized for your logistics data needs. Go to **File > New** and search for templates (e.g., sales reports, performance dashboards).
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8.4 Automating Data Updates with Power Query

Power Query plays a critical role in automating the data refresh process for recurring reports. By linking your report to dynamic data sources, Power Query can automate the updating of data without requiring manual intervention.

- **Steps to Automate Data Updates:**
 1. **Connect Your Data:** Use Power Query to pull data from your data source (e.g., CSV files, databases, or Excel workbooks). Go to **Data > Get Data** to import the data you need.

2. **Transform Data as Needed:** Clean and structure the data using Power Query tools such as filtering, sorting, and data transformations.
 3. **Load Data into Excel:** After transforming the data, load it into your Excel report.
 4. **Refresh Data Automatically:** Once your data source is connected, Excel allows you to refresh the report at the click of a button. Go to **Data > Refresh All** to pull in the latest data. You can also set automatic refresh intervals.
- **Practical Example: Automating Monthly Shipment Reports:**
 - Imagine you generate monthly shipment reports for port operations. Use Power Query to connect to your shipping data source, apply necessary transformations (e.g., filtering out canceled orders), and load the data into your report template.
 - Every month, simply click **Refresh All** to update the report with the latest data, eliminating the need to manually enter the data each time.
 - **Setting Scheduled Refreshes:**
 - If using Power Query in Power BI or Excel Online, you can schedule data refreshes to happen at regular intervals (daily, weekly, etc.), ensuring your reports are always up-to-date without manual intervention.
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Practical Example: Automating Port Operations Dashboard

- **Scenario:** You have a dashboard that tracks key performance indicators (KPIs) for port operations, such as cargo volume, on-time delivery rates, and shipping costs.
 1. Design the dashboard layout with visual elements like bar charts, pie charts, and trend lines for each KPI.
 2. Use Power Query to connect to your data source (e.g., a database that logs shipments and deliveries).
 3. Set up a data refresh schedule to automatically update the dashboard every day at 8:00 AM, ensuring that the data is always current when reviewed by management.

Logistics Dashboard Showing Fleet Delivery Status and...

