P24DS1P2

MANUAL OF EXCEL LAB FOR DATA ANALYTICS

Developed by

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Ranked **34th** at the National Level by MHRD through **NIRF 2023**

(Nationally Reaccredited at the **A++** Grade by NAAC with a CGPA of **3.69 out of 4**)

BONAFIDE CERTIFICATE

Name : _____

Register No : _____

Class : _____

Course Title : **P24DS1P2**

Course Title : **Advanced Excel Lab for Data Analytics**

Certified that this is the bonafide record of work done by me during Odd Semester of 2024 - 2025 and submitted to the Practical Examination on_____

Staff In-Charge **Head of the Department**

Examiners

1._____

2._____

INDEX

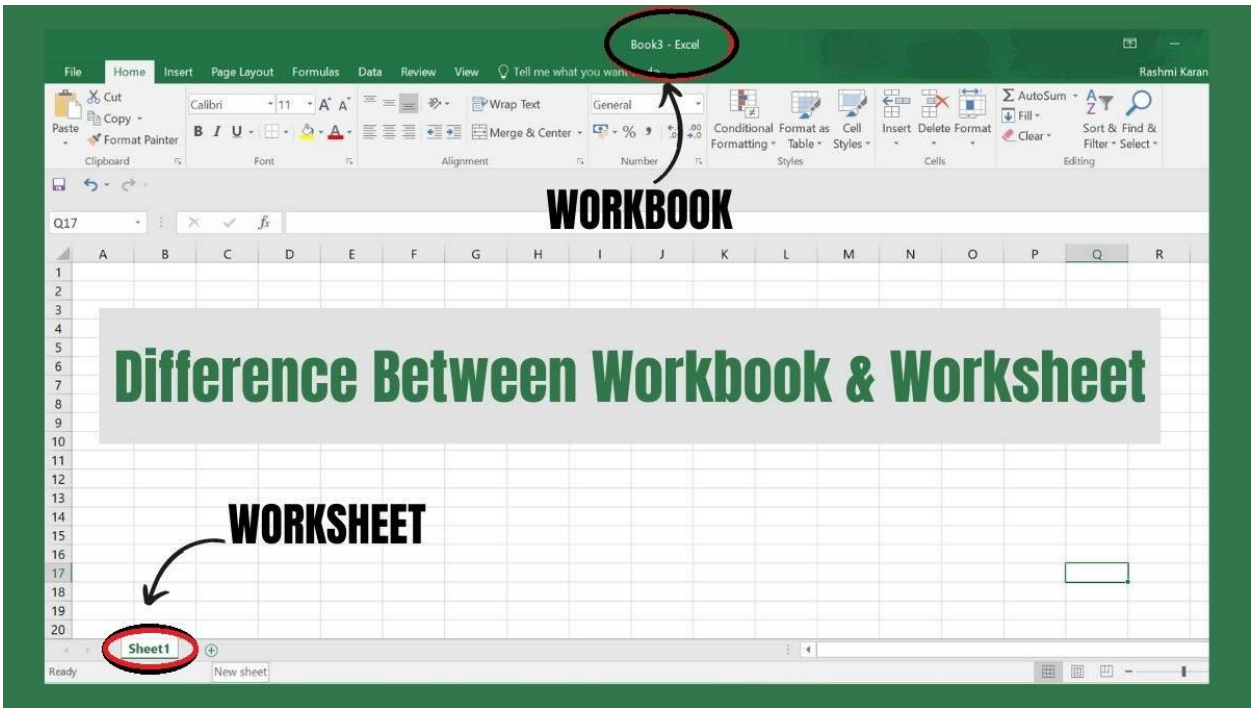
Introduction to Microsoft Excel

Microsoft Excel is a powerful spreadsheet application used for data organization, analysis, and visualization. It allows users to perform calculations, create charts, and manage large datasets efficiently.

Understanding the Excel Interface:

- **Workbook and Worksheets**

An Excel file is called a Workbook, which can contain multiple Worksheets. Each worksheet is like a separate page within the workbook.



- **Cells**

The basic unit in Excel is called a **Cell**. Cells are identified by their column letter and row number, such as A1, B2, or Z25. Data is entered into cells, and cells can contain numbers, text, or formulas.

- **Rows and Columns**

Cells are arranged in horizontal **Rows** and vertical **Columns**. Rows are numbered, while columns are labeled with letters (A, B, C, ..., Z, AA, AB, etc.).

- **Active Cell**

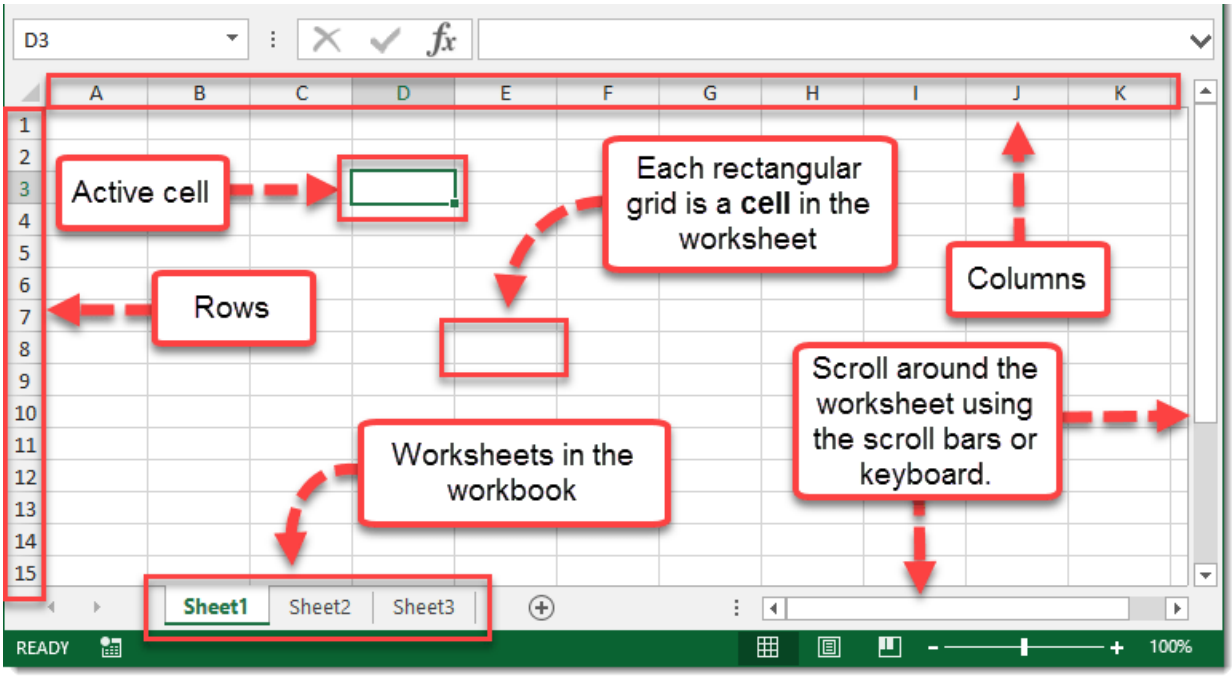
The Active Cell is the currently selected cell. It is highlighted with a thick border, and any data entered will be placed in this cell.

- **Cell Address**

The Cell Address is the unique identifier for a cell, consisting of its column letter and row number (e.g., A1, B2, or Z25).

- **Cell Range**

A Cell Range is a group of adjacent cells. It is specified by the cell addresses of the first and last cells in the range, separated by a colon (e.g., A1:B5 or C7:F12).



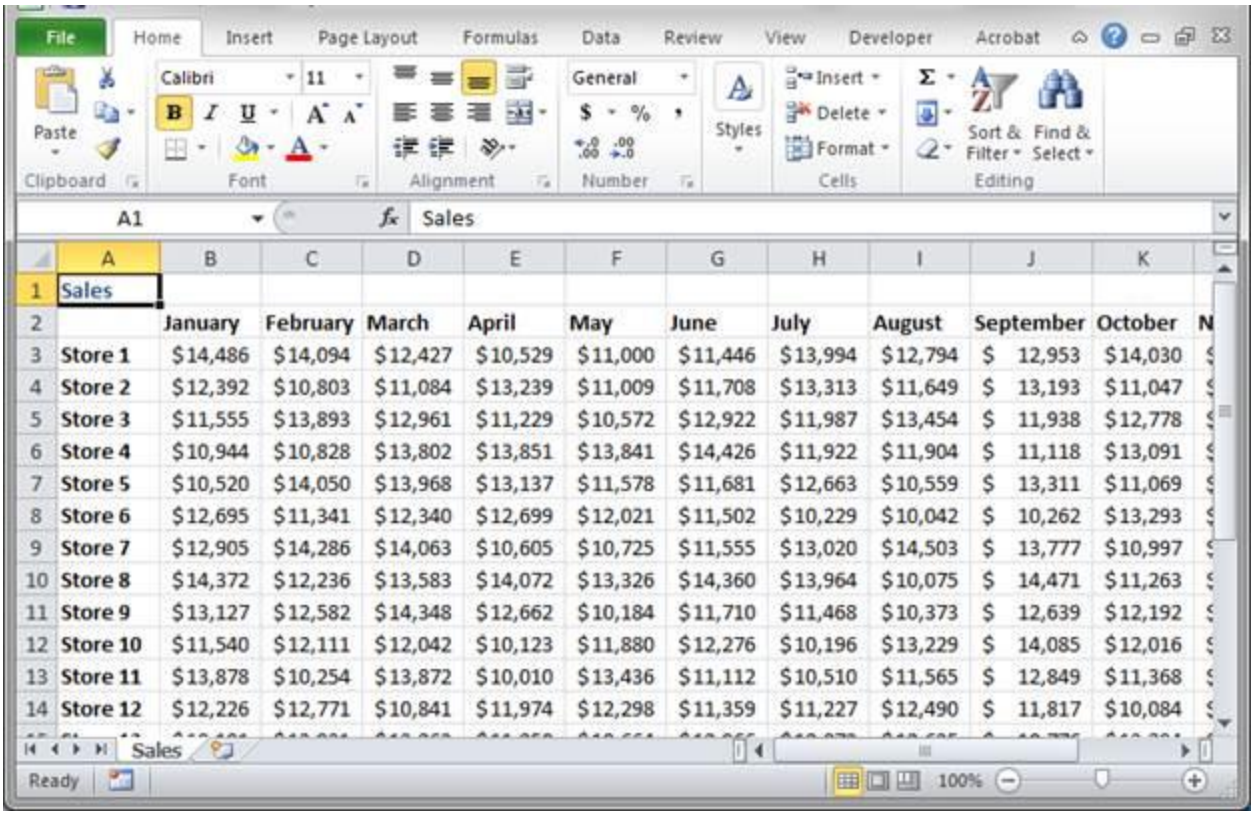
Entering and Editing Data:

- **Steps to enter data into a cell**

1. Click on the desired cell to make it the active cell.

2. Type the data (numbers, text, or formulas).

3. Press "Enter" to confirm the entry.



	A	B	C	D	E	F	G	H	I	J	K
1	Sales										
2		January	February	March	April	May	June	July	August	September	October
3	Store 1	$14,486	$14,094	$12,427	$10,529	$11,000	$11,446	$13,994	$12,794	$ 12,953	$14,030
4	Store 2	$12,392	$10,803	$11,084	$13,239	$11,009	$11,708	$13,313	$11,649	$ 13,193	$11,047
5	Store 3	$11,555	$13,893	$12,961	$11,229	$10,572	$12,922	$11,987	$13,454	$ 11,938	$12,778
6	Store 4	$10,944	$10,828	$13,802	$13,851	$13,841	$14,426	$11,922	$11,904	$ 11,118	$13,091
7	Store 5	$10,520	$14,050	$13,968	$13,137	$11,578	$11,681	$12,663	$10,559	$ 13,311	$11,069
8	Store 6	$12,695	$11,341	$12,340	$12,699	$12,021	$11,502	$10,229	$10,042	$ 10,262	$13,293
9	Store 7	$12,905	$14,286	$14,063	$10,605	$10,725	$11,555	$13,020	$14,503	$ 13,777	$10,997
10	Store 8	$14,372	$12,236	$13,583	$14,072	$13,326	$14,360	$13,964	$10,075	$ 14,471	$11,263
11	Store 9	$13,127	$12,582	$14,348	$12,662	$10,184	$11,710	$11,468	$10,373	$ 12,639	$12,192
12	Store 10	$11,540	$12,111	$12,042	$10,123	$11,880	$12,276	$10,196	$13,229	$ 14,085	$12,016
13	Store 11	$13,878	$10,254	$13,872	$10,010	$13,436	$11,112	$10,510	$11,565	$ 12,849	$11,368
14	Store 12	$12,226	$12,771	$10,841	$11,974	$12,298	$11,359	$11,227	$12,490	$ 11,817	$10,084

- **Steps to edit data in a cell**

1. Double-click on the cell to make it editable.

2. Make the necessary changes.

3. Press "Enter" or click on another cell to confirm the changes.

Navigating in Excel:

You can navigate through the worksheet using:

- **Mouse clicks:** Click on a cell to make it the active cell.

- **Arrow keys:** Use the up, down, left, and right arrow keys to move one cell at a time.

- **Page Up/Down keys:** Move up or down by one screen.

- **Home/End keys:** Move to the first or last cell in the current row.

- **Ctrl + Home/End:** Move to the first cell (A1) or the last used cell in the worksheet.

Week 1: Data Cleaning and Preparation

Aim:

To ensure data accuracy and consistency by identifying and rectifying errors, handling missing or redundant values, standardizing formats, and preparing datasets for effective analysis.

Dataset: Employee Data

Employee ID	Name	Age	Department	Joining_Date	Salary	Email
1	John Doe	30	IT	12/01/2015	60000	john.doe@example.com
2	Jane Smith	35	HR	03/14/2016	55000	jane.smith@example.com
3	NULL	40	IT	2017-06-10	70000	NULL
4	Michael Brown	-	IT	2018/07/23	50000	michaelb@example.com
5	Emily Davis		Marketing	05-18-2019	45000	emily.d@example.com
6	NULL	28	IT	01/05/2020	60000	NULL
7	Daniel White	33	HR	2018-11-15	52000	daniel.white@email.com
8	NULL	30	NULL	NULL	48000	NULL
9	Sarah Johnson	32	NULL	06/15/2019	53000	sarah.j@example.com
10	Robert Wilson	29	NULL	08-27-2020	55000	robert.w@example.com

Exercise 1: Identify and Fill Missing Values

Objective: Fill in the missing values for the `Name` and `Department` columns.

Steps:

1. Identify Missing Values:

   - Use the `IF` function to check for missing values. For example, in a new column, use:

     =IF(ISBLANK(B2), "Missing Name", "Name Present")

   - Similarly, for the `Department` column, use:

     =IF(ISBLANK(D2), "Missing Department", "Department Present")

2. Fill Missing Values:

   - Manually fill in missing names and departments based on known information. For example:

     - Employee ID 3's name could be "Unknown" and Department is "IT."

     - Employee ID 6's name could be "Unknown" and Department is "IT."

     - Employee ID 8 and 9’s department should be filled in if known.

3. Use `VLOOKUP`:

- If there is a reference table available, use `VLOOKUP` to fill missing values from the reference table.

Exercise 2: Correct Inconsistent Date Formats

Objective: Standardize the date format in the `Joining_Date` column to `MM/DD/YYYY`.

Steps:

1. Convert Text to Date:

- Use the `DATEVALUE` function to convert text dates to proper date format. For example:

=TEXT(E2, "MM/DD/YYYY")

2. Custom Formatting:

- Select the `Joining_Date` column, right-click, choose Format Cells , and set the format to `MM/DD/YYYY`.

Exercise 3: Handle Incorrect Age Data

Objective: Correct the `Age` column by removing or correcting invalid ages.

Steps:

1. Identify Invalid Ages:

- Use conditional formatting to highlight ages that are not within a reasonable range (e.g., less than 18 or greater than 65).

- Use a formula to flag incorrect values. For example:

=IF(OR(C2<18, C2>65), "Invalid Age", "Valid Age")

2. Replace Invalid Ages:

- Replace negative or incorrect values with either a default value (e.g., `30`) or leave them blank.

3. Calculate Age:

- If date of birth (DOB) is available, use the `YEARFRAC` function to calculate the correct age based on joining date and DOB.

Exercise 4: Standardize Email Format and Remove Duplicates

Objective: Correct and standardize the `Email` column and remove any redundant records.

Steps:

1. Check Email Format:

- Use a formula to check for proper email format:

=IF(ISNUMBER(SEARCH("@", F2)), "Valid Email", "Invalid Email")

- Correct invalid emails manually, ensuring each email has a unique value.

2. Remove Duplicates:

- Use the Remove Duplicates feature in Excel to eliminate duplicate entries based on the `Email` column.

3. Standardize Emails:

- Use the `LOWER` function to ensure all emails are in lowercase:

=LOWER(F2)

Exercise 5: Rectify Inconsistent Salary Data and Add Calculations

Objective: Correct any incorrect `Salary` values and add additional calculations for analysis.

Steps:

1. Identify Outliers:

- Use conditional formatting to highlight outliers based on a reasonable salary range (e.g., 40,000 to 80,000).

2. Replace Incorrect Values:

- Manually replace incorrect values or use a formula to replace values outside the expected range with a default value:

=IF(OR(E2<40000, E2>80000), 60000, E2)

3. Add Calculations:

- Add a column for `Annual Salary` by multiplying the monthly salary by 12.

  =E2*12

- Add another column for `Salary Increment (10%)` to calculate a 10% increment on the salary:

  =E2*1.1

Outputs:

Result:

Inconsistencies in data, such as duplicates and missing values, were identified and cleaned. This ensured that the dataset was ready for analysis and further manipulation.

Week 2: Advanced Filtering and Sorting

Aim:

To enable efficient data extraction and organization by applying advanced filtering and sorting techniques, allowing users to analyze and interpret large datasets more effectively.

Dataset: The dataset includes columns for employee details(Employee Name, Age, Department, Region), sales transactions(Sales amount, Transaction Date), and product information.

Exercise 1. Filtering Data by a Specific Value

Objective: Filter a list of employees to show only those in the "Finance" department.

Steps:

1. Select the Data Range:

- Click anywhere within your data set.

2. Apply AutoFilter:

- Go to the "Data" tab.

- Click on the "Filter" button.

3. Filter Data:

- Click the drop-down arrow in the "Department" column.

- Select "Finance" from the list.

Exercise 2. Sorting Data by Multiple Columns

Objective: Sort a list of employees first by "Department" and then by "Age" in ascending order.

Steps:

1. Select the Data Range:

- Highlight the entire data range, including headers.

2. Apply Custom Sort:

- Go to the "Data" tab.

- Click on the "Sort" button.

- In the Sort dialog box:

- Choose "Department" for the first level and set it to sort "A to Z."

- Click "Add Level."

- Choose "Age" for the second level and set it to sort "Smallest to Largest."

- Click "OK."

Exercise 3. Using Advanced Filter for Multiple Criteria

Objective: Filter employees older than 30 and in the "Finance" department.

Steps:

1. Set Up Criteria Range:

- Create a criteria range like this:

Age	Department
>30	Finance

2. Select the Data Range:

- Click anywhere within your data set.

3. Apply Advanced Filter:

- Go to the "Data" tab.

- Click on the "Advanced" button.

- In the Advanced Filter dialog box:

- Choose "Filter the list, in place."

- Set the "List range" to your data range.

- Set the "Criteria range" to your criteria range.

- Click "OK."

Exercise 4. Creating a Dynamic Filter with Slicers

Objective: Filter a list of sales data by "Region" using a slicer.

Steps:

1. Create a Table:

- Select your data range.

- Go to the "Insert" tab.

- Click "Table" and confirm your data range.

2. Add Slicers:

- With your table selected, go to the "Table Design" tab.

- Click "Insert Slicer."

- Choose the "Region" column. - Click "OK."

3. Use Slicers:

- Click on the slicer buttons to filter your data by region.

Exercise 5. Filtering and Sorting Combined

Objective: Filter a list of products by "Category" and then sort the filtered products by "Price."

Steps:

1. Apply AutoFilter:

- Click anywhere within your data set.

- Go to the "Data" tab.

- Click on the "Filter" button.

2. Filter Data:

- Click the drop-down arrow in the "Category" column.

- Select the desired category.

3. Apply Custom Sort:

- Highlight the filtered data range, including headers.

- Go to the "Data" tab.

- Click on the "Sort" button. - In the Sort dialog box:

- Choose "Price" and set it to sort "Smallest to Largest" (or "Largest to Smallest").

- Click "OK."

Exercise 6. Extract Unique Values Using Advanced Filter

Objective: Extract a list of unique customer names from a list of transactions.

Steps:

1. Select the Data Range:

- Highlight the column with customer names.

2. Apply Advanced Filter: - Go to the "Data" tab.

- Click on the "Advanced" button.

- In the Advanced Filter dialog box:

- Choose "Copy to another location."

- Set the "List range" to the customer names column.

- Check "Unique records only."

- Set the "Copy to" range to where you want the unique values to appear.

- Click "OK."

Exercise 7. Sorting Dates in Descending Order

Objective: Sort a list of transactions by date in descending order.

Steps:

1. Select the Data Range:

- Highlight the entire data range, including headers.

2. Apply Custom Sort:

- Go to the "Data" tab.

- Click on the "Sort" button. - In the Sort dialog box:

- Choose "Date" and set it to sort "Newest to Oldest."

- Click "OK."

Exercise 8. Filter Data by Top 10 Values

Objective: Filter a list of sales to show only the top 10 sales amounts.

Steps:

1. Select the Data Range:

- Click anywhere within your data set.

2. Apply AutoFilter:

- Go to the "Data" tab.

- Click on the "Filter" button.

3. Filter Data:

- Click the drop-down arrow in the "Sales Amount" column.

- Select "Number Filters" > "Top 10..."

- In the Top 10 AutoFilter dialog box, choose "Top" and "10" items by "Sales Amount."

- Click "OK."

Exercise 9. Filtering Data Using Wildcards

Objective: Filter a list of product names to show only those starting with "Pro."

Steps:

1. Select the Data Range:

- Click anywhere within your data set.

2. Apply AutoFilter:

- Go to the "Data" tab.

- Click on the "Filter" button.

3. Filter Data:

- Click the drop-down arrow in the "Product Name" column.

- Select "Text Filters" > "Begins With..."

- In the Custom AutoFilter dialog box, type "Pro*" (the asterisk is a wildcard representing any number of characters).

- Click "OK."

Exercise 10. Custom Filter for Date Range

Objective: Filter a list of transactions to show only those within a specific date range.

Steps:

1. Select the Data Range:

- Click anywhere within your data set.

2. Apply AutoFilter:

- Go to the "Data" tab.

- Click on the "Filter" button.

3. Filter Data:

- Click the drop-down arrow in the "Date" column.

- Select "Date Filters" > "Between..."

- In the Custom AutoFilter dialog box, enter the start and end dates for your range.

- Click "OK."

Outputs:

Result:

Filtering and sorting of large datasets were performed efficiently to extract meaningful information. Multi-level sorting and custom filters were applied to refine the analysis.

Week 3: Data Visualization with Charts

Aim:

To transform raw data into insightful visual representations, enabling users to communicate trends, patterns, and relationships clearly through the use of various types of charts in Excel.

Dataset: Student Mark list

Student Name	Age	Grade	Subject	Marks	Region	Exam Date
Alice Brown	20	B	Mathematics	85	North	2024-01-15
Bob Johnson	21	A	Physics	92	East	2024-02-10
Charlie Black	22	C	Chemistry	78	West	2024-03-05
Eve White	20	A	Mathematics	88	South	2024-04-20
Frank Green	21	B	Biology	83	North	2024-05-30
Grace Blue	22	A	Physics	90	East	2024-06-15
Hank Purple	20	B	Chemistry	82	West	2024-07-01
Ivy Orange	21	A	Biology	95	South	2024-07-20
Jane Smith	22	C	Mathematics	75	North	2024-08-15
John Doe	20	B	Physics	88	East	2024-09-05

Exercise 1. Column Chart: Marks Distribution by Subject

Objective: Create a column chart to display the average marks for each subject.

Steps:

1. Prepare Data:

   - Create a summary table with average marks by subject:

Subject	Average Marks
Mathematics	82.67
Physics	90
Chemistry	80
Biology	89

2. Select Data:

   - Highlight the summary table.

3. Insert Column Chart:

- Go to the "Insert" tab.
- Click on "Insert Column or Bar Chart."
- Choose "Clustered Column."

4. Format Chart:
- Add chart title: "Average Marks by Subject."
- Add axis titles: "Subject" (horizontal axis) and "Average Marks" (vertical axis).

Exercise 2. Pie Chart: Grade Distribution

Objective: Create a pie chart to display the distribution of grades.

Steps:

1. Prepare Data:
- Create a summary table with the count of each grade:

Grade	Count
A	4
B	4
C	2

2. Select Data:
- Highlight the summary table.

3. Insert Pie Chart:
- Go to the "Insert" tab.
- Click on "Insert Pie or Doughnut Chart."
- Choose "Pie."

4. Format Chart:
- Add chart title: "Grade Distribution."
- Add data labels to show percentages.

Exercise 3. Line Chart: Marks Over Time

Objective: Create a line chart to display the trend of marks over exam dates.

Steps:

1. Select Data:
- Highlight the columns "Exam Date" and "Marks."

2. Insert Line Chart:
- Go to the "Insert" tab.

- Click on "Insert Line or Area Chart."
- Choose "Line."

3. Format Chart:
- Add chart title: "Marks Over Time."
- Add axis titles: "Exam Date" (horizontal axis) and "Marks" (vertical axis).

Exercise 4. Pivot Chart: Marks by Subject and Region

Objective: Create an interactive chart to analyze marks by subject and region.

Steps:

1. Create a Pivot Table:
- Select the entire dataset.
- Go to the "Insert" tab.
- Click on "PivotTable."
- Choose where to place the PivotTable (e.g., a new worksheet).

2. Configure Pivot Table:
- In the PivotTable Fields pane, drag "Subject" to the Rows area. - Drag "Region" to the Columns area.
- Drag "Marks" to the Values area.

3. Create Pivot Chart:
- Click anywhere inside the PivotTable.
- Go to the "PivotTable Analyze" tab.
- Click on "PivotChart."
- Choose a chart type (e.g., "Clustered Column").

4. Format Chart:
- Add chart title: "Marks by Subject and Region."

Exercise 5. Bar Chart: Count of Students by Age

Objective: Create a bar chart to display the count of students by age.

Steps:

1. Prepare Data:
- Create a summary table with the count of students by age:

Age	Count
20	4
21	3
22	3

2. Select Data:

- Highlight the summary table.

3. Insert Bar Chart:

- Go to the "Insert" tab.
- Click on "Insert Column or Bar Chart."
- Choose "Clustered Bar."

4. Format Chart:

- Add chart title: "Count of Students by Age."
- Add axis titles: "Count" (horizontal axis) and "Age" (vertical axis).

Exercise 6. Scatter Plot: Marks vs. Age

Objective: Create a scatter plot to show the relationship between marks and age.

Steps:

1. Select Data:

- Highlight the columns "Age" and "Marks."

2. Insert Scatter Plot:

- Go to the "Insert" tab.
- Click on "Insert Scatter (X, Y) or Bubble Chart."
- Choose "Scatter."

3. Format Chart:

- Add chart title: "Marks vs. Age."
- Add axis titles: "Age" (horizontal axis) and "Marks" (vertical axis).

Exercise 7. Area Chart: Cumulative Marks Over Time

Objective: Create an area chart to display cumulative marks over exam dates.

Steps:

1. Prepare Data:

- Create a column with cumulative marks:

Exam Date	Marks	Cumulative Marks
2024-01-15	85	85
2024-02-10	92	177
2024-03-05	78	255
2024-04-20	88	343
2024-05-30	83	426
2024-06-15	90	516
2024-07-01	82	598
2024-07-20	95	693
2024-08-15	75	768
2024-09-05	88	856

2. Select Data:

- Highlight the columns "Exam Date" and "Cumulative Marks."

3. Insert Area Chart:

- Go to the "Insert" tab.
- Click on "Insert Line or Area Chart."
- Choose "Stacked Area."

4. Format Chart:

- Add chart title: "Cumulative Marks Over Time."
- Add axis titles: "Exam Date" (horizontal axis) and "Cumulative Marks" (vertical axis).

Exercise 8. Histogram: Distribution of Marks

Objective: Create a histogram to display the distribution of marks.

Steps:

1. Select Data:

- Highlight the column "Marks."

2. Insert Histogram:

- Go to the "Insert" tab.
- Click on "Insert Statistic Chart."
- Choose "Histogram."

3. Format Chart:

- Add chart title: "Distribution of Marks."

Exercise 9. Bubble Chart: Marks, Age, and Grade

Objective: Create a bubble chart to display marks and age, with bubble size representing grades.

Steps:

1. Prepare Data:

- Assign numerical values to grades:

Grade	Value
A	3
B	2
C	1

2. Select Data:

- Highlight the columns "Age," "Marks," and "Grade (Value)."

3. Insert Bubble Chart:

- Go to the "Insert" tab.
- Click on "Insert Scatter (X, Y) or Bubble Chart."
- Choose "Bubble."

4. Format Chart:

- Add chart title: "Marks, Age, and Grade."
- Add axis titles: "Age" (horizontal axis) and "Marks" (vertical axis).

Exercise 10. Combo

Objective: Create a combo chart to display marks for each student in different subjects, with a line indicating the average marks.

Steps:

1. Prepare Data:

- Use the existing dataset:

Student Name	Mathematics	Physics	Chemistry	Biology

Alice Brown	85			
Bob Johnson		92		
Charlie Black			78	
Eve White	88			
Frank Green				83
Grace Blue		90		
Hank Purple			82	
Ivy Orange				95
Jane Smith	75			
John Doe		88		

- Add a row for average marks:

Student Name	**Mathematics**	**Physics**	**Chemistry**	**Biology**
Average	82.67	90	80	89

2. Select Data:

- Highlight the entire table including the average row.

3. Insert Combo Chart:

- Go to the "Insert" tab on the Ribbon.
- Click on "Insert Combo Chart."
- Choose "Clustered Column - Line."

4. Customize Chart Types for Series:

- Right-click the chart and select "Change Chart Type."
- For each data series (Mathematics, Physics, Chemistry, Biology), ensure they are set to "Clustered Column."
- Set the "Average" series to "Line."

5. Format Chart:

- Add chart title: "Marks by Subject with Average Line."
- Add axis titles: "Subjects" (horizontal axis) and "Marks" (vertical axis).
- Ensure the "Average" line stands out (e.g., by changing its color or thickness).

Outputs:

Result:

Various types of charts (e.g., bar, line, pie) were created to visually represent data trends and comparisons. Chart elements were customized for clarity and better communication.

Week 4: Pivot Tables and Pivot Charts

Aim:

To analyze and summarize complex datasets dynamically, providing a powerful tool for data aggregation, comparison, and exploration through interactive tables and charts.

Dataset: Faculty Details

Faculty Name	Age	Department	Position	Salary	Region	Hire Date
Alice Brown	45	Mathematics	Professor	85000	North	2010-01-15
Bob Johnson	38	Physics	Associate Prof	75000	East	2012-02-10
Charlie Black	50	Chemistry	Professor	92000	West	2008-03-05
Eve White	35	Mathematics	Assistant Prof	60000	South	2015-04-20
Frank Green	40	Biology	Professor	87000	North	2011-05-30
Grace Blue	45	Physics	Professor	90000	East	2009-06-15
Hank Purple	37	Chemistry	Associate Prof	70000	West	2013-07-01
Ivy Orange	42	Biology	Associate Prof	72000	South	2012-07-20
Jane Smith	48	Mathematics	Professor	88000	North	2007-08-15
John Doe	36	Physics	Assistant Prof	65000	East	2016-09-05
Kate Yellow	39	Chemistry	Assistant Prof	68000	West	2014-10-15
Luke Cyan	44	Biology	Professor	89000	South	2010-11-10

Exercise 1. PivotTable: Total Salary by Department

Objective: Create a PivotTable to display the total salary for each department.

Steps:

1. Select the entire dataset.
2. Go to the "Insert" tab and click on "PivotTable."
3. Choose where to place the PivotTable (e.g., a new worksheet).
4. Drag " Department" to the Rows area.
5. Drag "Salary" to the Values area.
6. Ensure the aggregation function is set to "Sum."

Exercise 2. PivotChart: Average Salary by Region

Objective: Create a PivotChart to display the average salary by region.

Steps:

1. Create a PivotTable with "Region" in the Rows area and "Salary" in the Values area, set to "Average."
2. Click anywhere inside the PivotTable.
3. Go to the "PivotTable Analyze" tab and click on "PivotChart."
4. Choose a chart type (e.g., "Clustered Column").

Exercise 3. PivotTable: Count of Faculty by Position

Objective: Create a PivotTable to display the count of faculty members by position.

Steps:

1. Select the entire dataset.
2. Go to the "Insert" tab and click on "PivotTable."
3. Choose where to place the PivotTable.
4. Drag "Position" to the Rows area.
5. Drag "Faculty Name" to the Values area.
6. Ensure the aggregation function is set to "Count."

Exercise 4. PivotChart: Salary Distribution by Department

Objective: Create a PivotChart to display the distribution of salaries by department.

Steps:

1. Create a PivotTable with "Department" in the Rows area and "Salary" in the Values area.
2. Click anywhere inside the PivotTable.
3. Go to the "PivotTable Analyze" tab and click on "PivotChart."
4. Choose a chart type (e.g., "Box and Whisker" or "Histogram").

Exercise 5. PivotTable: Average Age by Department

Objective: Create a PivotTable to display the average age of faculty members by department.

Steps:

1. Select the entire dataset.
2. Go to the "Insert" tab and click on "PivotTable."

3. Choose where to place the PivotTable.

4. Drag "Department" to the Rows area.

5. Drag "Age" to the Values area.

6. Ensure the aggregation function is set to "Average."

Exercise 6. PivotChart: Number of Faculty Hired Each Year

Objective: Create a PivotChart to display the number of faculty members hired each year.

Steps:

1. Create a PivotTable with "Hire Date" (grouped by year) in the Rows area and "Faculty Name" in the Values area (set to count).

2. Click anywhere inside the PivotTable.

3. Go to the "PivotTable Analyze" tab and click on "PivotChart."

4. Choose a chart type (e.g., "Line").

Exercise 7. PivotTable: Total Salary by Region and Department

Objective: Create a PivotTable to display the total salary by region and department.

Steps:

1. Select the entire dataset.

2. Go to the "Insert" tab and click on "PivotTable."

3. Choose where to place the PivotTable.

4. Drag "Region" to the Rows area.

5. Drag "Department" to the Columns area.

6. Drag "Salary" to the Values area.

7. Ensure the aggregation function is set to "Sum."

Exercise 8. PivotChart: Salary and Age Distribution

Objective: Create a PivotChart to display the distribution of salary and age.

Steps:

1. Create a PivotTable with "Age" and "Salary" in the Rows area (grouped as needed) and "Faculty Name" in the Values area (set to count).

2. Click anywhere inside the PivotTable.

3. Go to the "PivotTable Analyze" tab and click on "PivotChart."

4. Choose a chart type (e.g., "Scatter").

Exercise 9. PivotTable: Count of Faculty by Region and Position

Objective: Create a PivotTable to display the count of faculty members by region and position.

Steps:

1. Select the entire dataset.

2. Go to the "Insert" tab and click on "PivotTable."

3. Choose where to place the PivotTable.

4. Drag "Region" to the Rows area.

5. Drag "Position" to the Columns area.

6. Drag "Faculty Name" to the Values area.

7. Ensure the aggregation function is set to "Count."

Exercise 10. PivotChart: Average Salary by Position Over Time

Objective: Create a PivotChart to display the average salary by position over time.

Steps:

1. Create a PivotTable with "Hire Date" (grouped by year) in the Rows area, "Position" in the Columns area, and "Salary" in the Values area (set to average).

2. Click anywhere inside the PivotTable.

3. Go to the "PivotTable Analyze" tab and click on "PivotChart."

4. Choose a chart type (e.g., "Line").

Outputs:

Result:

Pivot tables were generated to summarize and dynamically analyze data. Pivot charts were used to visually represent aggregated data insights.

Week 5: Advanced Formulas and Functions

Aim:

To leverage Excel's advanced formulas and functions to automate calculations, perform complex data manipulations, and streamline data analysis tasks for more efficient workflows.

Dataset: Sales Data

Order ID	Customer Name	Region	Product	Quantity	Unit Price	Order Date	Sales Rep
1001	John Smith	North	Laptop	5	1200	2024-01-15	Alice Brown
1002	Jane Doe	East	Smartphone	10	800	2024-02-10	Bob Johnson
1003	Dave Green	South	Tablet	7	400	2024-03-05	Charlie Black
1004	Lucy White	West	Monitor	12	150	2024-04-20	Eve White
1005	Peter Black	North	Keyboard	20	50	2024-05-30	Frank Green
1006	Anna Yellow	East	Laptop	3	1200	2024-06-15	Grace Blue
1007	Mike Purple	South	Smartphone	8	800	2024-07-01	Hank Purple
1008	Sarah Blue	West	Tablet	5	400	2024-07-20	Ivy Orange
1009	Chris Red	North	Monitor	10	150	2024-08-15	Jane Smith
1010	Emily Green	East	Keyboard	15	50	2024-09-05	John Doe
1011	Robert Brown	South	Laptop	4	1200	2024-10-15	Kate Yellow
1012	Katie Black	West	Smartphone	9	800	2024-11-10	Luke Cyan

Exercise 1. Calculate Total Sales

Objective: Calculate the total sales for each order.

Steps:

1. Add a new column titled "Total Sales."
2. In the first cell of "Total Sales," use the formula `=Quantity * Unit Price`.
3. Drag the formula down to fill the rest of the column.

Exercise 2. Calculate Average Sales per Region

Objective: Find the average sales amount for each region.

Steps:

1. Use the `AVERAGEIFS` function.
2. Formula example: `=AVERAGEIFS(Dataset[Total Sales], Dataset[Region], "North")` for North region.
3. Repeat for other regions.

Exercise 3. Extract Month and Year from Order Date

Objective: Extract and display the month and year from the order date.

Steps:

1. Add new columns titled "Order Month" and "Order Year."
2. Use the formulas `=MONTH(Order Date)` and `=YEAR(Order Date)` respectively.
3. Drag the formulas down to fill the rest of the columns.

Exercise 4. Find Highest and Lowest Sales

Objective: Identify the highest and lowest sales amounts.

Steps:

1. Use the `MAX` and `MIN` functions.
2. Formula example: `=MAX(Dataset[Total Sales])` and `=MIN(Dataset[Total Sales])`.

Exercise 5. Count Orders per Sales Rep

Objective: Count the number of orders handled by each sales rep.

Steps:

1. Use the `COUNTIF` function.
2. Formula example: `=COUNTIF(Dataset[Sales Rep], "Alice Brown")` for Alice Brown.
3. Repeat for other sales reps.

Exercise 6. Calculate Total Quantity Sold by Product

Objective: Calculate the total quantity sold for each product.

Steps:

1. Use the `SUMIF` function.
2. Formula example: `=SUMIF(Dataset[Product], "Laptop", Dataset[Quantity])` for Laptops.
3. Repeat for other products.

Exercise 7. Apply Conditional Formatting for High Sales

Objective: Highlight orders with sales greater than $5,000.

Steps:

1. Select the "Total Sales" column.
2. Go to "Home" > "Conditional Formatting" > "New Rule."
3. Use a formula to determine which cells to format: `=Total Sales > 5000`.
4. Set the desired formatting.

Exercise 8. Calculate Percentage Contribution to Total Sales

Objective: Calculate each order's percentage contribution to the total sales.

Steps:

1. Add a new column titled "Percentage Contribution."
2. Use the formula `=Total Sales / SUM(Dataset[Total Sales])`.
3. Drag the formula down to fill the rest of the column.

Exercise 9. Create a Dynamic Dropdown List

Objective: Create a dropdown list of unique product names.

Steps:

1. Select a cell for the dropdown list.
2. Go to "Data" > "Data Validation."
3. Choose "List" and use the `UNIQUE` function to generate the list:
`=UNIQUE(Dataset[Product])`.

Exercise 10. Calculate Year-over-Year Sales Growth

Objective: Calculate the year-over-year sales growth for each region.

Steps:

1. Add new columns titled "Previous Year Sales" and "YoY Growth."
2. Use the `OFFSET` and `SUMIFS` functions to calculate previous year sales.
3. Use the formula `=(This Year Sales - Previous Year Sales) / Previous Year Sales` for YoY Growth.

Outputs:

Result:

Advanced Excel functions like `VLOOKUP`, `IF`, and `INDEX-MATCH` were used to automate complex calculations. This enhanced the accuracy and efficiency of the data analysis.

Week 6: Data Analysis with What-If Scenarios

Aim:

To explore different business or data outcomes by changing input variables, allowing users to evaluate various scenarios and make informed decisions using Excel's What-If analysis tools.

Dataset: Sales Data for a Retail Store

Product ID	Product Name	Category	Current Price	Unit Cost	Units Sold	Total Revenue	Total Cost	Profit
101	Widget A	Gadgets	20	10	200	4000	2000	2000
102	Widget B	Gadgets	15	8	300	4500	2400	2100
103	Gadget X	Devices	50	30	100	5000	3000	2000
104	Gadget Y	Devices	45	25	150	6750	3750	3000
105	Thingamajig	Accessories	5	2	500	2500	1000	1500
106	Doodad	Accessories	10	5	400	4000	2000	2000
107	Gizmo Z	Tools	35	20	200	7000	4000	3000
108	Gizmo Q	Tools	40	22	150	6000	3300	2700

Exercise 1. What-If: Change in Selling Price

Objective: Analyze how a change in the selling price affects total revenue and profit for "Widget A."

Steps:

1. Create a copy of the current price and name it "New Price."
2. Change "New Price" for "Widget A" to different values (e.g., $18, $22).
3. Calculate the new total revenue and profit based on the new prices using the formula `=New Price * Units Sold` for total revenue and `=New Total Revenue - Total Cost` for profit.

Exercise 2. What-If: Increase in Unit Cost

Objective: Analyze the impact of an increase in unit cost on profit for "Gizmo Z."

Steps:

1. Increase the "Unit Cost" for "Gizmo Z" by 10%.
2. Calculate the new total cost using the formula `=Unit Cost * Units Sold`.
3. Recalculate profit using `=Total Revenue - New Total Cost`.

Exercise 3. What-If: Discount on All Products

Objective: Apply a 10% discount on the current prices of all products and analyze the impact on total revenue.

Steps:

1. Create a new column "Discounted Price" and calculate it using `=Current Price * 0.9`.
2. Calculate new total revenue using `=Discounted Price * Units Sold`.
3. Sum the new total revenue for all products to see the overall impact.

Exercise 4. What-If: Increase in Units Sold

Objective: Analyze how an increase in units sold by 20% affects total revenue and profit for all products.

Steps:

1. Create a new column "New Units Sold" and calculate it using `=Units Sold * 1.2`.
2. Calculate new total revenue and profit based on the increased units sold using `=Current Price * New Units Sold` for total revenue and `=New Total Revenue - Total Cost` for profit.

Exercise 5. What-If: Fixed Costs Addition

Objective: Determine the impact of adding a fixed cost of $5000 on the overall profit.

Steps:

1. Calculate the total profit for all products.
2. Subtract the fixed cost from the total profit using `=Total Profit - 5000`.

Exercise 6. What-If: Change in Sales Mix

Objective: Analyze how changing the sales mix (selling more "Gadget X" and less "Widget B") affects total revenue and profit.

Steps:

1. Increase the units sold for "Gadget X" by 50 units and decrease "Widget B" by 50 units.
2. Calculate the new total revenue and profit using the new units sold values.

Exercise 7. What-If: Seasonal Sales Increase

Objective: Apply a 30% increase in sales for all products during a seasonal promotion and analyze the impact on total revenue.

Steps:

1. Create a new column "Seasonal Units Sold" and calculate it using `=Units Sold * 1.3`.
2. Calculate new total revenue using `=Current Price * Seasonal Units Sold`.

Exercise 8. What-If: Volume Discount Impact

Objective: Apply a volume discount of 5% for orders of more than 300 units and analyze the impact on total revenue.

Steps:

1. Create a new column "Discounted Price for Volume" and calculate it using `=IF(Units Sold > 300, Current Price * 0.95, Current Price)`.
2. Calculate new total revenue using `=Discounted Price for Volume * Units Sold`.

Exercise 9. What-If: Profit Margin Adjustment

Objective: Adjust the profit margin for all products to 40% and analyze the new selling price and profit.

Steps:

1. Calculate the new selling price using the desired profit margin formula: `=Unit Cost / (1 - Desired Margin)`.
2. Calculate the new profit using `=New Selling Price * Units Sold - Total Cost`.

Exercise 10. What-If: Break-Even Analysis

Objective: Determine the break-even point in units for "Gizmo Q."

Steps:

1. Calculate the break-even point using the formula: `=Fixed Costs / (Selling Price - Unit Cost)`.
2. Use $5000 as the fixed cost for this analysis.

Outputs:

Result:

Multiple outcomes were explored using What-If Analysis tools, such as Scenario Manager and Goal Seek. This helped in assessing different business decisions or project outcomes.

Week 7: Data Validation and Dynamic Dropdowns

Aim:

To improve data input accuracy by implementing validation rules and dynamic dropdown lists, ensuring that only appropriate and valid entries are made in specified data fields

Dataset: Employee Information

Employee ID	Employee Name	Department	Position	Hire Date	Salary	Location
001	Alice Brown	HR	Manager	2010-01-15	70000	New York
002	Bob Johnson	IT	Developer	2012-02-10	80000	Boston
003	Charlie Black	Sales	Sales Lead	2008-03-05	75000	Chicago
004	Eve White	Marketing	Coordinator	2015-04-20	65000	Seattle
005	Frank Green	HR	Assistant	2011-05-30	50000	New York
006	Grace Blue	IT	Developer	2009-06-15	82000	Boston
007	Hank Purple	Sales	Sales Lead	2013-07-01	78000	Chicago
008	Ivy Orange	Marketing	Coordinator	2012-07-20	67000	Seattle
009	Jane Smith	HR	Manager	2007-08-15	71000	New York
010	John Doe	IT	Developer	2016-09-05	85000	Boston
011	Kate Yellow	Sales	Sales Lead	2014-10-15	76000	Chicago
012	Luke Cyan	Marketing	Coordinator	2010-11-10	66000	Seattle

Exercise 1. Simple Data Validation for Salary

Objective: Ensure that the salary values entered are between $50,000 and $100,000.

Steps:

1. Select the "Salary" column.

2. Go to the "Data" tab and click on "Data Validation."

3. In the "Settings" tab, choose "Whole number" for "Allow" and set the "Minimum" to 50000 and "Maximum" to 100000.

4. Click "OK."

Exercise 2. Dropdown List for Department

Objective: Create a dropdown list for the "Department" column using predefined departments.

Steps:

1. List the departments in a new range of cells, e.g., `HR`, `IT`, `Sales`, `Marketing`.

2. Select the "Department" column.

3. Go to "Data" > "Data Validation."

4. Choose "List" for "Allow" and select the range with the department names as the "Source."

5. Click "OK."

Exercise 3. Custom Error Message for Salary

Objective: Set a custom error message for salary validation.

Steps:

1. Select the "Salary" column.

2. Go to "Data" > "Data Validation."

3. In the "Error Alert" tab, set the "Style" to "Stop."

4. Enter a custom title and error message, e.g., "Invalid Salary" and "Salary must be between $50,000 and $100,000."

5. Click "OK."

Exercise 4. Dropdown List for Position

Objective: Create a dropdown list for the "Position" column based on predefined positions.

Steps:

1. List the positions in a new range of cells, e.g., `Manager`, `Developer`, `Sales Lead`, `Coordinator`.

2. Select the "Position" column.

3. Go to "Data" > "Data Validation."

4. Choose "List" for "Allow" and select the range with the position names as the "Source."

5. Click "OK."

Exercise 5. Date Validation for Hire Date

Objective: Ensure that the hire dates are valid dates in the past.

Steps:

1. Select the "Hire Date" column.

2. Go to "Data" > "Data Validation."

3. In the "Settings" tab, choose "Date" for "Allow."

4. Set the "End date" to `=TODAY()`.

5. Click "OK."

Exercise 6. Dynamic Dropdown List for Location

Objective: Create a dynamic dropdown list for the "Location" column that updates automatically when new locations are added.

Steps:

1. List the locations in a new range of cells.

2. Define a named range for the locations. Go to "Formulas" > "Name Manager" > "New."

3. Name the range and use the formula `=OFFSET($X$1,0,0,COUNTA($X:$X),1)` where `X` is the column with locations.

4. Select the "Location" column.

5. Go to "Data" > "Data Validation."

6. Choose "List" for "Allow" and use the named range as the "Source."

7. Click "OK."

Exercise 7. Validate Employee ID Format

Objective: Ensure that the employee ID is a 3-digit number.

Steps:

1. Select the "Employee ID" column.

2. Go to "Data" > "Data Validation."

3. In the "Settings" tab, choose "Text Length" for "Allow."

4. Set the "Minimum" and "Maximum" to 3.

5. Click "OK."

Exercise 8. Dependent Dropdown Lists (Department and Position)

Objective: Create dependent dropdown lists where the positions are based on the selected department.

Steps:

1. Create named ranges for each department's positions (e.g., `HR_Positions` for HR-related positions).

2. Select the "Department" column and create a dropdown list as described in Exercise 2.

3. Select the "Position" column.

4. Go to "Data" > "Data Validation."

5. Choose "List" for "Allow" and use the formula `=INDIRECT(D2 & "_Positions")` as the "Source," assuming D2 is the first cell in the "Department" column.

6. Click "OK."

Exercise 9. Allow Only Unique Employee IDs

Objective: Ensure that each employee ID is unique.

Steps:

1. Select the "Employee ID" column.

2. Go to "Data" > "Data Validation."

3. In the "Settings" tab, choose "Custom" for "Allow."

4. Use the formula `=COUNTIF($A$2:$A$13,A2)=1` where A2 is the first cell in the "Employee ID" column.

5. Click "OK."

Exercise 10. Dropdown List for Dynamic Team Assignment

Objective: Create a dynamic dropdown list for team assignments that updates based on the number of employees in each department.

Steps:

1. List the departments in a new range of cells.

2. Next to each department, list team names dynamically using a formula based on the number of employees (e.g., `=IF(COUNTA(D:D)>=3, "Team A", "Team B")`).

3. Define a named range for the team names.

4. Select the "Team Assignment" column.

5. Go to "Data" > "Data Validation."

6. Choose "List" for "Allow" and use the named range as the "Source."

7. Click "OK."

Outputs:

Result:

Data validation rules were implemented to restrict invalid inputs, ensuring data quality. Dynamic dropdowns were created to make data entry faster and more accurate.

Week 8: Conditional Formatting for Data Insights

Aim:

To enhance data readability by applying conditional formatting, making it easier to identify key insights such as trends, outliers, and performance metrics based on predefined conditions.

Dataset: Sales Performance

Salesperson	Region	Quarter	Sales ($)	Target ($)	Sales Growth (%)
John Doe	North	Q1	15000	20000	5
Alice Brown	South	Q1	22000	25000	10
Bob Johnson	East	Q1	18000	22000	8
Charlie Black	West	Q1	25000	30000	12
Eve White	North	Q2	17000	21000	6
Frank Green	South	Q2	23000	26000	9
Grace Blue	East	Q2	19000	23000	7
Hank Purple	West	Q2	26000	31000	13
Ivy Orange	North	Q3	16000	21000	5
Jane Smith	South	Q3	24000	27000	10
Kate Yellow	East	Q3	20000	24000	8
Luke Cyan	West	Q3	27000	32000	14

Exercise 1. Highlight Sales Above Target

Objective: Use conditional formatting to highlight sales figures that are above the target.

Steps:

1. Select the "Sales ($)" column.

2. Go to "Home" > "Conditional Formatting" > "New Rule."

3. Choose "Use a formula to determine which cells to format."

4. Enter the formula `=B2>D2` where B2 is the first cell in "Sales ($)" and D2 is the corresponding "Target ($)" cell.

5. Click "Format" and choose a fill color (e.g., green).

6. Click "OK."

Exercise 2. Highlight Sales Below Target

Objective: Use conditional formatting to highlight sales figures that are below the target.

Steps:

1. Select the "Sales ($)" column.

2. Go to "Home" > "Conditional Formatting" > "New Rule."

3. Choose "Use a formula to determine which cells to format."

4. Enter the formula `=B2<D2`.

5. Click "Format" and choose a fill color (e.g., red).

6. Click "OK."

Exercise 3. Top 10% Performers

Objective: Highlight the top 10% performers based on sales.

Steps:

1. Select the "Sales ($)" column.

2. Go to "Home" > "Conditional Formatting" > "Top/Bottom Rules" > "Top 10%."

3. Choose a format, e.g., bold text with a light green fill.

4. Click "OK."

Exercise 4. Data Bars for Sales

Objective: Use data bars to visually represent the sales figures.

Steps:

1. Select the "Sales ($)" column.

2. Go to "Home" > "Conditional Formatting" > "Data Bars."

3. Choose a gradient fill or solid fill.

4. Click "OK."

Exercise 5. Icon Sets for Sales Growth

Objective: Use icon sets to visualize sales growth percentages.

Steps:

1. Select the "Sales Growth (%)" column.

2. Go to "Home" > "Conditional Formatting" > "Icon Sets."

3. Choose an icon set (e.g., three arrows).

4. Click "OK."

Exercise 6. Color Scales for Sales

Objective: Apply color scales to the sales figures to show ranges.

Steps:

1. Select the "Sales ($)" column.

2. Go to "Home" > "Conditional Formatting" > "Color Scales."

3. Choose a color scale (e.g., green-yellow-red).

4. Click "OK."

Exercise 7. Sales Performance by Region

Objective: Use conditional formatting to highlight the highest and lowest sales in each region.

Steps:

1. Select the entire range of the dataset.

2. Go to "Home" > "Conditional Formatting" > "New Rule."

3. Choose "Use a formula to determine which cells to format."

4. Enter the formula `=B2=MAX(IF($C$2:$C$13=C2,$B$2:$B$13))` to highlight the highest sales in each region.

5. Click "Format" and choose a fill color.

6. Repeat for the lowest sales with the formula `=B2=MIN(IF($C$2:$C$13=C2,$B$2:$B$13))`.

7. Click "OK."

Exercise 8. Highlight Negative Growth

Objective: Highlight negative sales growth percentages.

Steps:

1. Select the "Sales Growth (%)" column.

2. Go to "Home" > "Conditional Formatting" > "New Rule."

3. Choose "Format only cells that contain."

4. Set the rule to format cells with values less than 0.

5. Click "Format" and choose a fill color (e.g., red).

6. Click "OK."

Exercise 9. Duplicate Sales Entries

Objective: Identify duplicate sales entries in the dataset.

Steps:

1. Select the "Sales ($)" column.

2. Go to "Home" > "Conditional Formatting" > "Highlight Cells Rules" > "Duplicate Values."

3. Choose a format for the duplicates.

4. Click "OK."

Exercise 10. Conditional Formatting for Target Achievement

Objective: Use conditional formatting to highlight salespeople who have achieved or exceeded their targets.

Steps:

1. Select the "Salesperson" column.

2. Go to "Home" > "Conditional Formatting" > "New Rule."

3. Choose "Use a formula to determine which cells to format."

4. Enter the formula `=B2>=D2`.

5. Click "Format" and choose a fill color (e.g., light green).

6. Click "OK."

Outputs:

Result:

Conditional formatting was applied to highlight critical data points, such as high-performing metrics or outliers. This visual approach made it easier to identify trends and patterns.

Week 9: Advanced Data Import and Export

Aim:

To enable seamless integration of external data sources into Excel for analysis and to efficiently export Excel data to other systems or file formats, ensuring smooth data exchange and compatibility.

Dataset: Product Inventory

Product ID	Product Name	Category	Supplier	Stock	Price ($)	Reorder Level
P001	Laptop	Electronics	TechSupply	25	800	10
P002	Smartphone	Electronics	MobileMart	40	500	20
P003	Office Chair	Furniture	OfficeWorld	15	120	5
P004	Desk	Furniture	OfficeWorld	10	300	2
P005	Monitor	Electronics	TechSupply	30	150	10
P006	Coffee Maker	Appliances	HomeGoods	20	75	5
P007	Microwave Oven	Appliances	HomeGoods	8	90	3
P008	Printer	Electronics	PrintPro	12	200	4
P009	Bookshelf	Furniture	FurnitureHub	5	80	2
P010	Tablet	Electronics	MobileMart	25	250	10
P011	Blender	Appliances	HomeGoods	18	50	5
P012	Sofa	Furniture	FurnitureHub	6	400	2

Exercise_1. Importing Data from CSV

Objective: Import the dataset from a CSV file into Excel.

Steps:

1. Save the dataset as a CSV file (e.g., `Product_Inventory.csv`).

2. Open Excel and go to the "Data" tab.

3. Click on "From Text" in the "Get External Data" group.

4. Select the CSV file and click "Import."

5. Follow the Text Import Wizard, ensuring the delimiter is set to "Comma."

6. Click "Finish" and choose where to place the data.

Exercise_2. Importing Data from a Web Page

Objective: Import data from a web page into Excel.

Steps:

1. Go to the "Data" tab and click on "From Web."

2. Enter the URL of the web page containing the data (e.g., a product listing page).

3. Click "Go" and wait for the page to load.

4. Select the table containing the data and click "Import."

5. Choose where to place the data in the worksheet.

Exercise_3. Importing Data from Access Database

Objective: Import data from an Access database into Excel.

Steps:

1. Open the Access database containing the product inventory data.

2. Go to the "Data" tab in Excel.

3. Click on "From Access" in the "Get External Data" group.

4. Select the Access database file and click "Open."

5. Choose the table to import and click "OK."

6. Choose where to place the data.

Exercise_4. Importing Data from SQL Server

Objective: Import data from a SQL Server database into Excel.

Steps:

1. Go to the "Data" tab and click on "From Other Sources" > "From SQL Server."

2. Enter the SQL Server name and credentials.

3. Select the database and table containing the product inventory data.

4. Follow the prompts to import the data into Excel.

Exercise_5. Exporting Data to CSV

Objective: Export the dataset to a CSV file.

Steps:

1. Select the dataset in Excel.

2. Go to "File" > "Save As."

3. Choose the location to save the file.

4. Select "CSV (Comma delimited)" from the "Save as type" dropdown.

5. Click "Save."

Exercise_6. Exporting Data to Access Database

Objective: Export the dataset to an Access database.

Steps:

1. Open Access and create a new database.

2. Go to the "External Data" tab.

3. Click on "Excel" in the "Import & Link" group.

4. Select the Excel file containing the dataset and click "Open."

5. Follow the prompts to export the data to a new table in Access.

Exercise_7. Exporting Data to XML

Objective: Export the dataset to an XML file.

Steps:

1. Select the dataset in Excel.

2. Go to "File" > "Save As."

3. Choose the location to save the file.

4. Select "XML Data" from the "Save as type" dropdown.

5. Click "Save."

Exercise_8. Importing Data from XML

Objective: Import data from an XML file into Excel.

Steps:

1. Save the dataset as an XML file (e.g., `Product_Inventory.xml`).

2. Open Excel and go to the "Data" tab.

3. Click on "From Other Sources" > "From XML Data Import."

4. Select the XML file and click "Import."

5. Follow the prompts to import the data into Excel.

Exercise_9. Importing Data from Text File

Objective: Import data from a text file into Excel.

Steps:

1. Save the dataset as a text file (e.g., `Product_Inventory.txt`).

2. Open Excel and go to the "Data" tab.

3. Click on "From Text" in the "Get External Data" group.

4. Select the text file and click "Import."

5. Follow the Text Import Wizard, ensuring the delimiter is set to "Tab" or "Comma" based on the file format.

6. Click "Finish" and choose where to place the data.

Exercise_10. Exporting Data to Excel Template

Objective: Export the dataset to an Excel template.

Steps:

1. Select the dataset in Excel.

2. Go to "File" > "Save As."

3. Choose the location to save the file.

4. Select "Excel Template" from the "Save as type" dropdown.

5. Click "Save."

Outputs:

Result:

Data was imported from external sources like CSV and SQL databases and exported for use in other applications. This ensured smooth data integration and transfer between systems.

Week 10: Dashboard Design and Integration with Power BI

Aim:

To create interactive and visually engaging dashboards by integrating Excel with Power BI, providing users with dynamic tools to analyze data and share insights across platforms for enhanced decision-making.

Dataset: Company Sales Performance

Salesperson	Region	Quarter	Sales ($)	Target ($)	Sales Growth (%)	Customer Satisfaction (%)
John Doe	North	Q1	15000	20000	5	80
Alice Brown	South	Q1	22000	25000	10	90
Bob Johnson	East	Q1	18000	22000	8	85
Charlie Black	West	Q1	25000	30000	12	75
Eve White	North	Q2	17000	21000	6	82
Frank Green	South	Q2	23000	26000	9	88
Grace Blue	East	Q2	19000	23000	7	86
Hank Purple	West	Q2	26000	31000	13	77
Ivy Orange	North	Q3	16000	21000	5	81
Jane Smith	South	Q3	24000	27000	10	89
Kate Yellow	East	Q3	20000	24000	8	84
Luke Cyan	West	Q3	27000	32000	14	78

Exercise 1. Designing the Dashboard in Excel

Objective: Create a comprehensive sales performance dashboard in Excel.

Steps:

1. Create a New Sheet for the Dashboard:

- Add a new worksheet named "Dashboard."

2. Insert a Pivot Table:

- Select your dataset.

- Go to "Insert" > "PivotTable."

- Place the PivotTable on the "Dashboard" sheet.

3. Set Up the Pivot Table:

- Drag "Salesperson" to the Rows area.

- Drag "Region" to the Columns area.

- Drag "Sales ($)" to the Values area.

- Drag "Quarter" to the Filters area.

4. Insert Pivot Charts:

- With the PivotTable selected, go to "Insert" > "PivotChart."

- Choose a chart type (e.g., Column Chart).

- Repeat to add charts for "Sales Growth (%)" and "Customer Satisfaction (%)."

5. Add Slicers:

- Select the PivotTable.

- Go to "Analyze" > "Insert Slicer."

- Add slicers for "Region" and "Quarter."

6. Create Key Performance Indicators (KPIs):

- Create formulas in the "Dashboard" sheet to calculate KPIs like Total Sales, Average Sales Growth, and Average Customer Satisfaction.

- Example formula for Total Sales: `=SUM(Products!D2:D13)`

- Display these KPIs using large, bold text boxes.

7. Design and Formatting:

- Format the charts and PivotTables for a professional look.

- Use colors, data labels, and titles to make the dashboard user-friendly.

- Align and arrange the elements neatly on the dashboard.

Exercise 2. Exporting Data to Power BI

Objective: Integrate the Excel dashboard with Power BI for advanced visualization and analysis.

Steps:

1. **Prepare Your Data for Power BI:**

   - Ensure your dataset is clean and formatted correctly.

   - Save the Excel file.

2. **Open Power BI Desktop:**

   - Launch Power BI Desktop on your computer.

3. **Import Data from Excel:**

   - Go to "Home" > "Get Data" > "Excel."

   - Select your Excel file and click "Open."

   - Choose the sheets/tables to import and click "Load."

4. **Create Relationships (if necessary):**

   - If your data is in multiple tables, create relationships between them in the "Model" view.

5. **Design Power BI Report:**

   - Use the visualizations pane to create charts, graphs, and other visuals.

   - Add visuals like bar charts, line charts, pie charts, and gauges to represent the data.

   - Use slicers for interactive filtering.

   - Add calculated columns or measures if needed for KPIs.

6. **Customize and Format:**

   - Format the visuals for readability and consistency.

   - Use themes and color palettes to enhance the visual appeal.

7. **Publish to Power BI Service:**

- Save your Power BI Desktop file.

- Click "Publish" and sign in to your Power BI account.

- Choose a workspace to publish the report.

8. Create Power BI Dashboard:

- Go to Power BI Service and locate your report.

- Pin visuals to a new or existing dashboard for a consolidated view.

- Arrange the pinned tiles on the dashboard.

9. Set Up Refresh Schedule:

- Configure the dataset to refresh automatically from the Excel file if it's stored in OneDrive or SharePoint.

- Go to "Datasets" in Power BI Service, select the dataset, and configure the refresh settings.

10. Share the Dashboard:

- Share the dashboard with colleagues by providing access through Power BI Service.

- Use the "Share" option to invite users or create a link.

Outputs:

Result:

Interactive dashboards were designed in Excel and integrated with Power BI for enhanced visualization. This enabled real-time data insights to be shared across platforms.

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