Assignment 6: Excel Data Analytics – Sales Performance Analysis

Task 1: Basic Excel Formulas

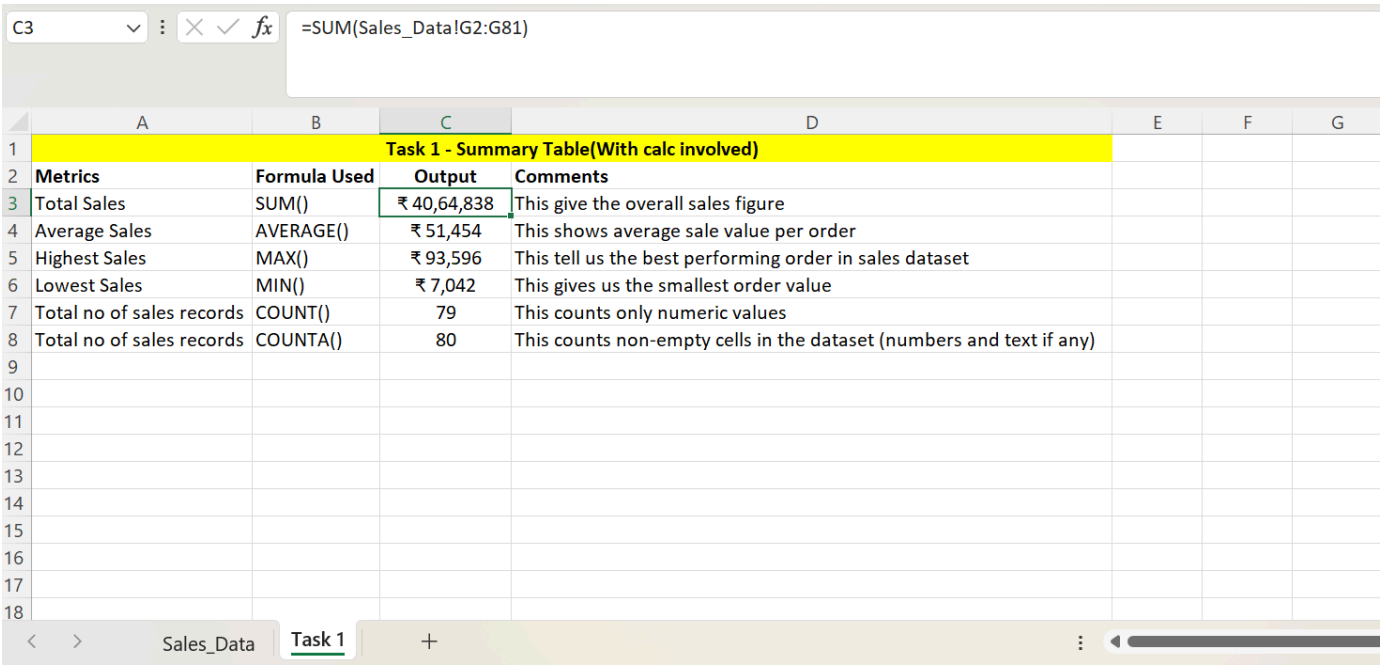
Objective of Task 1

The objective of Task 1 is to apply basic Excel formulas to analyze the sales dataset. This task focuses on calculating total sales, average sales, highest and lowest sales values, and counting the number of sales records using appropriate Excel functions. These calculations help in understanding overall sales performance and data completeness.

1.1 Calculation of Total Sales using SUM()

Explanation:
The SUM() function is used to calculate the total sales by adding all sales values from the Sales column.

Insight:
This provides the overall revenue generated and helps in assessing the total business performance.

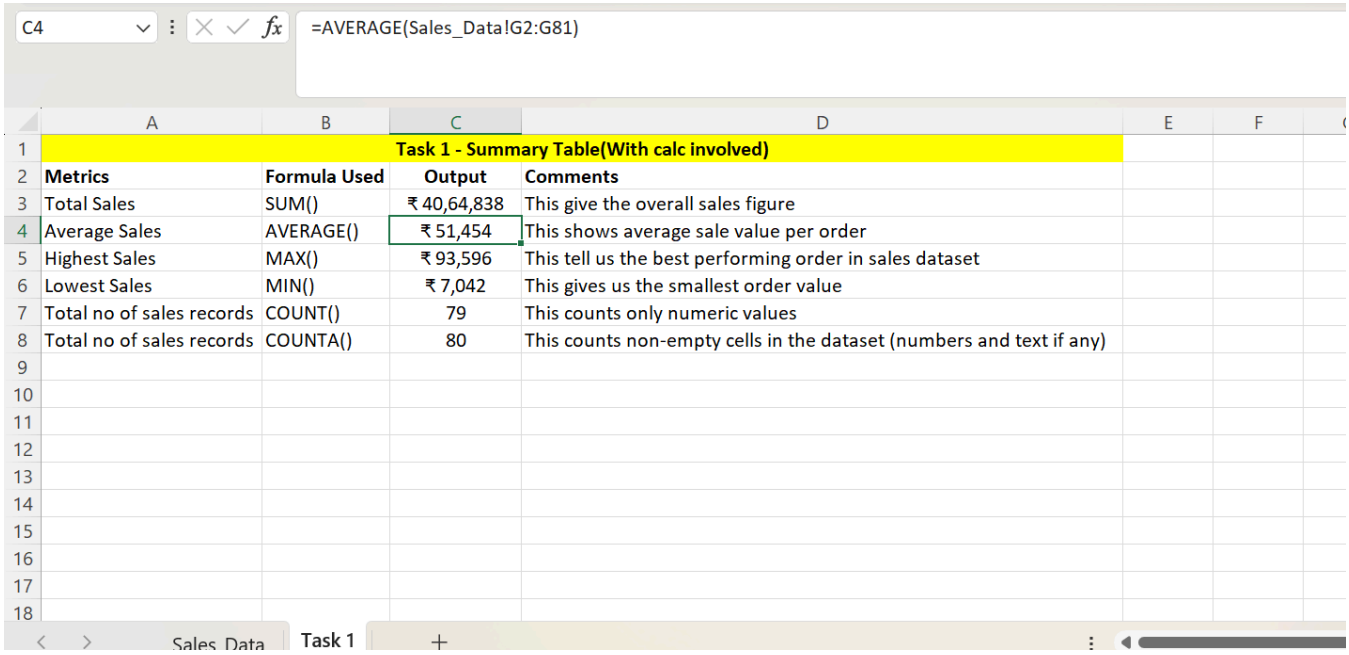


	A	B	C	D	E	F	G
1	Task 1 - Summary Table(With calc involved)						
2	**Metrics**	**Formula Used**	**Output**	**Comments**			
3	Total Sales	SUM()	₹ 40,64,838	This give the overall sales figure			
4	Average Sales	AVERAGE()	₹ 51,454	This shows average sale value per order			
5	Highest Sales	MAX()	₹ 93,596	This tell us the best performing order in sales dataset			
6	Lowest Sales	MIN()	₹ 7,042	This gives us the smallest order value			
7	Total no of sales records	COUNT()	79	This counts only numeric values			
8	Total no of sales records	COUNTA()	80	This counts non-empty cells in the dataset (numbers and text if any)			

1.2: Calculation of Average Sales using AVERAGE()

Explanation:
The AVERAGE() function calculates the mean sales value per order from the dataset.

Insight:
This helps in understanding the typical order value and identifying sales trends.



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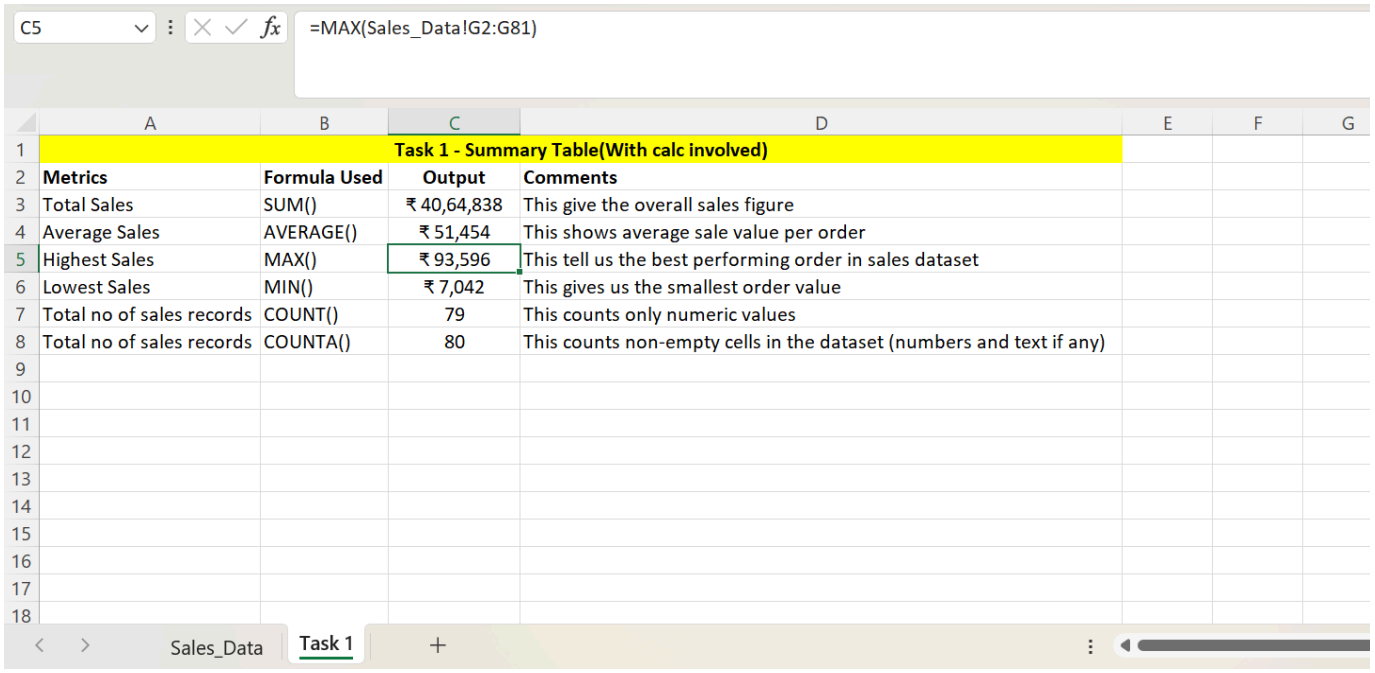
8	Total no of sales records	COUNTA()	80	This counts non-empty cells in the dataset (numbers and text if any)

1.3: Identification of Highest Sales using MAX()

Explanation:
The MAX() function is used to find the highest sales value recorded in the dataset.

Insight:
This highlights the best-performing sales transaction and indicates peak sales performance.



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9							
10							
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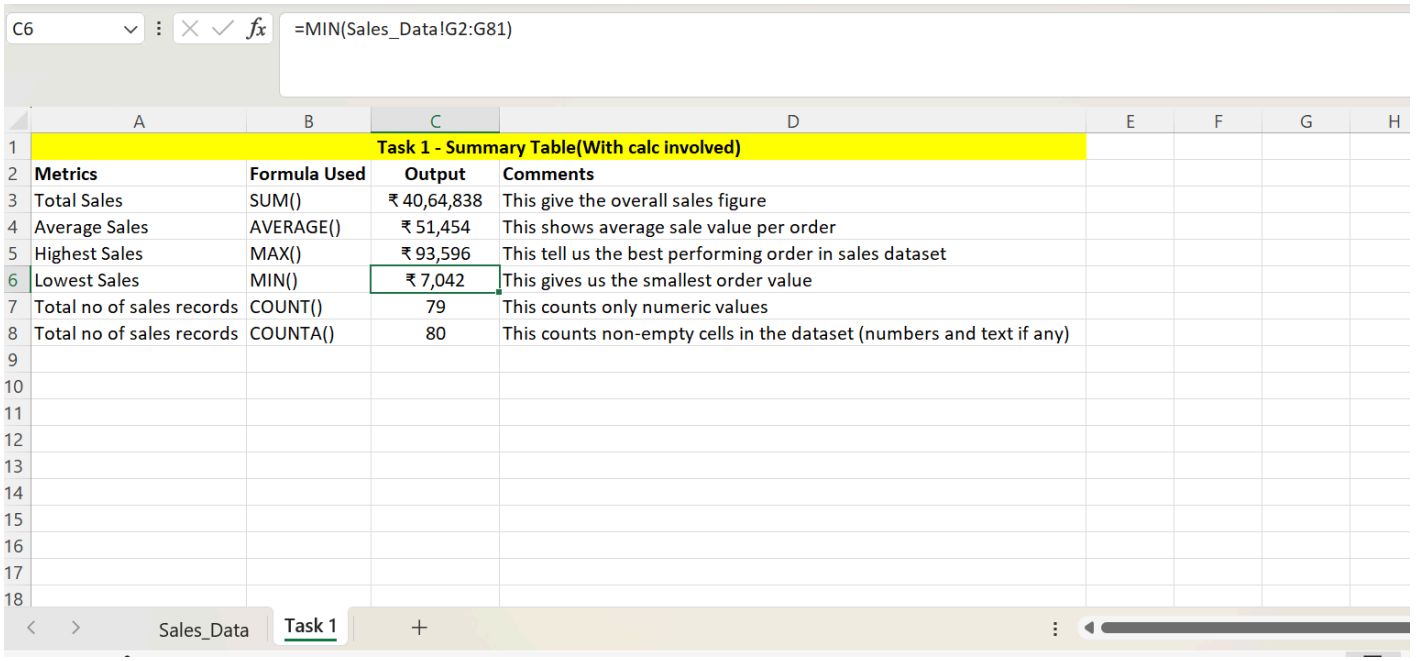
1.4: Identification of Lowest Sales using MIN()

Explanation:
The MIN() function identifies the smallest sales value in the dataset.

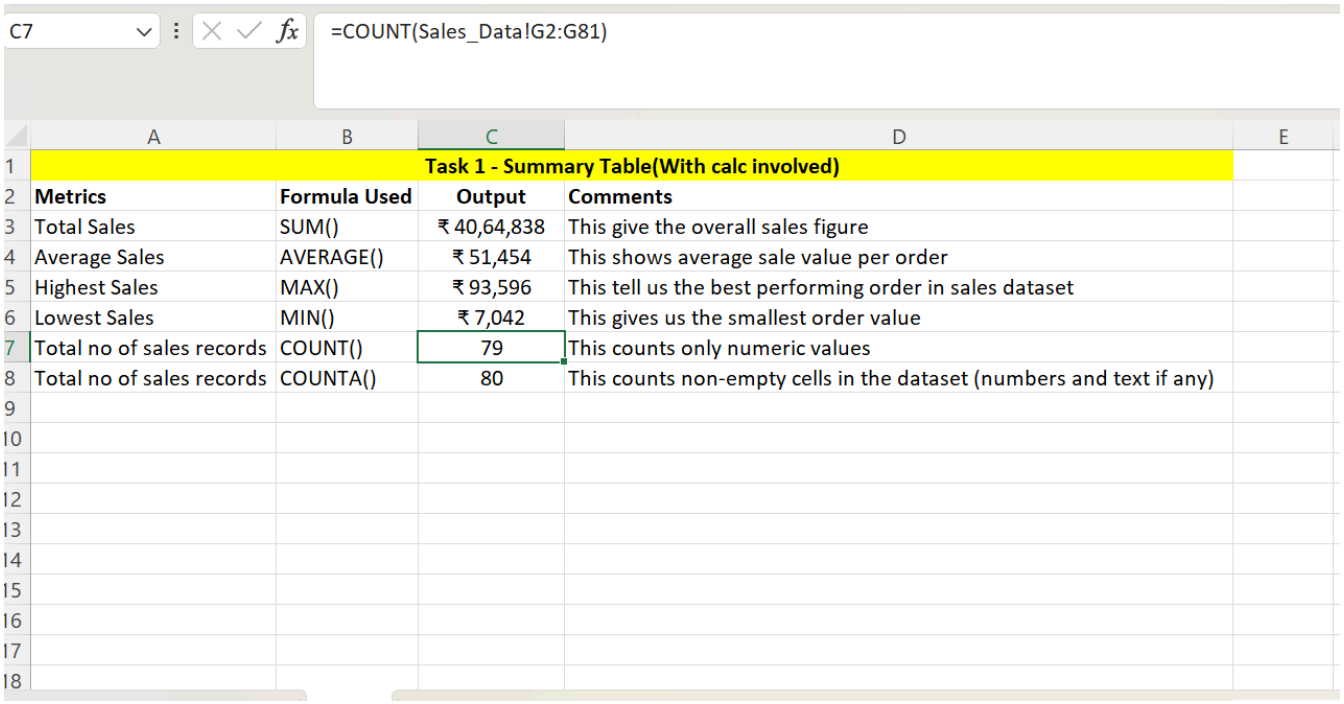
Insight:
This helps in recognizing low-value transactions and potential areas for improvement.



1.5: Counting Sales Records using COUNT()

Explanation:
The COUNT() function counts only numeric values in the Sales column.

Insight:
This ensures that only valid numerical sales records are considered for analysis.



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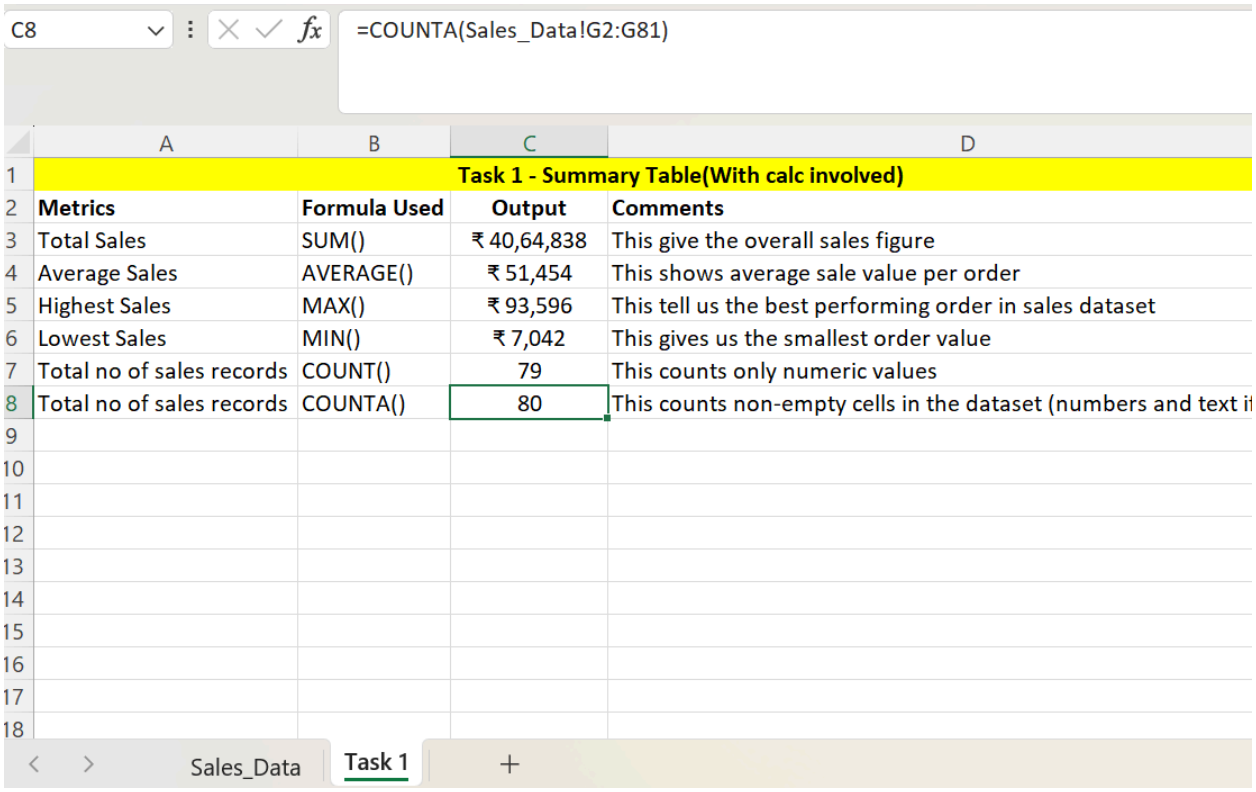
1.6: Counting Non-Empty Records using COUNTA()

Explanation:
The COUNTA() function counts all non-empty cells, including numeric and text values.

Insight:
This helps verify data completeness and identify missing or blank entries in the dataset.



Summary of Task 1

Through Task 1, essential descriptive statistics were generated using basic Excel formulas. These calculations form the foundation for further analysis, validation, and reporting in data analytics workflows

Task 2: Logical Functions (IF, AND)

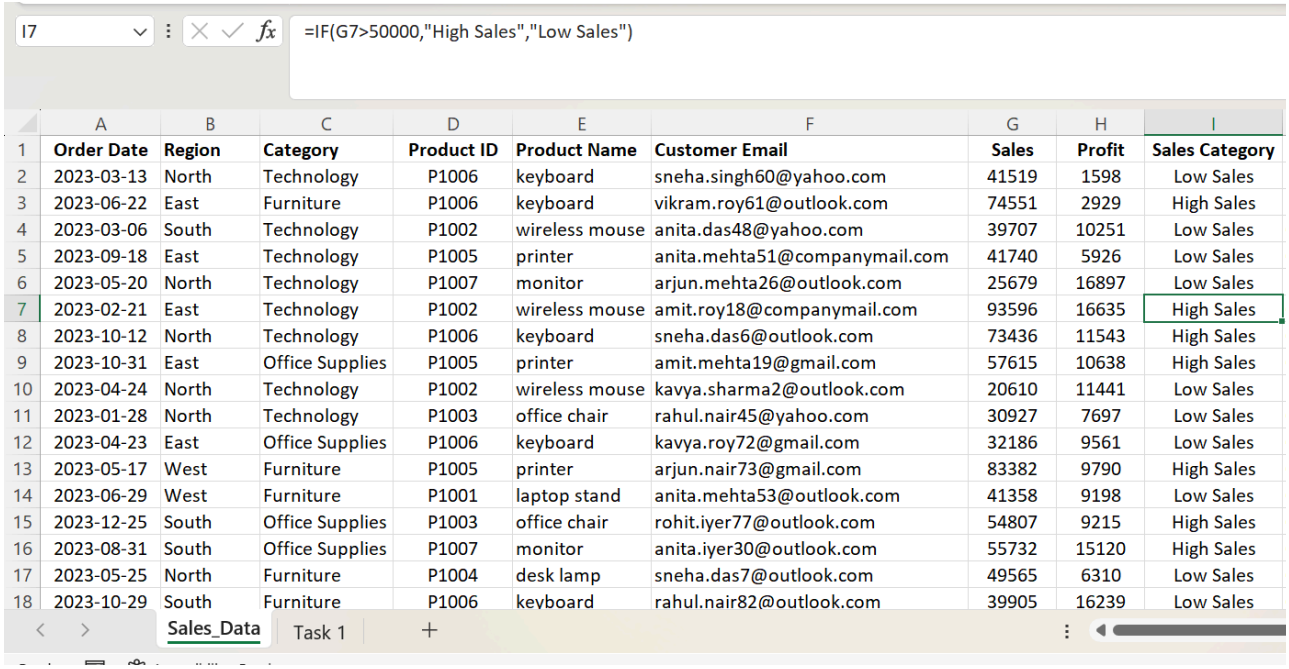
Objective of Task 2

The objective of Task 2 is to apply logical functions in Excel to classify and evaluate sales performance. This task focuses on using conditional logic to categorize sales values and assess overall performance based on multiple conditions involving sales and profit.

2.1: Classification of Sales using IF() Function

Explanation:
The IF() function is used to classify each sales transaction as either *High Sales* or *Low Sales* based on a predefined sales threshold.

Insight:
This classification helps quickly identify high-value transactions and supports sales performance analysis.



	A	B	C	D	E	F	G	H	I
1	**Order Date**	**Region**	**Category**	**Product ID**	**Product Name**	**Customer Email**	**Sales**	**Profit**	**Sales Category**
2	2023-03-13	North	Technology	P1006	keyboard	sneha.singh60@yahoo.com	41519	1598	Low Sales
3	2023-06-22	East	Furniture	P1006	keyboard	vikram.roy61@outlook.com	74551	2929	High Sales
4	2023-03-06	South	Technology	P1002	wireless mouse	anita.das48@yahoo.com	39707	10251	Low Sales
5	2023-09-18	East	Technology	P1005	printer	anita.mehta51@companymail.com	41740	5926	Low Sales
6	2023-05-20	North	Technology	P1007	monitor	arjun.mehta26@outlook.com	25679	16897	Low Sales
7	2023-02-21	East	Technology	P1002	wireless mouse	amit.roy18@companymail.com	93596	16635	High Sales
8	2023-10-12	North	Technology	P1006	keyboard	sneha.das6@outlook.com	73436	11543	High Sales
9	2023-10-31	East	Office Supplies	P1005	printer	amit.mehta19@gmail.com	57615	10638	High Sales
10	2023-04-24	North	Technology	P1002	wireless mouse	kavya.sharma2@outlook.com	20610	11441	Low Sales
11	2023-01-28	North	Technology	P1003	office chair	rahul.nair45@yahoo.com	30927	7697	Low Sales
12	2023-04-23	East	Office Supplies	P1006	keyboard	kavya.roy72@gmail.com	32186	9561	Low Sales
13	2023-05-17	West	Furniture	P1005	printer	arjun.nair73@gmail.com	83382	9790	High Sales
14	2023-06-29	West	Furniture	P1001	laptop stand	anita.mehta53@outlook.com	41358	9198	Low Sales
15	2023-12-25	South	Office Supplies	P1003	office chair	rohit.iyer77@outlook.com	54807	9215	High Sales
16	2023-08-31	South	Office Supplies	P1007	monitor	anita.iyer30@outlook.com	55732	15120	High Sales
17	2023-05-25	North	Furniture	P1004	desk lamp	sneha.das7@outlook.com	49565	6310	Low Sales
18	2023-10-29	South	Furniture	P1006	keyboard	rahul.nair82@outlook.com	39905	16239	Low Sales

Sales_Data | Task 1

Analysis-

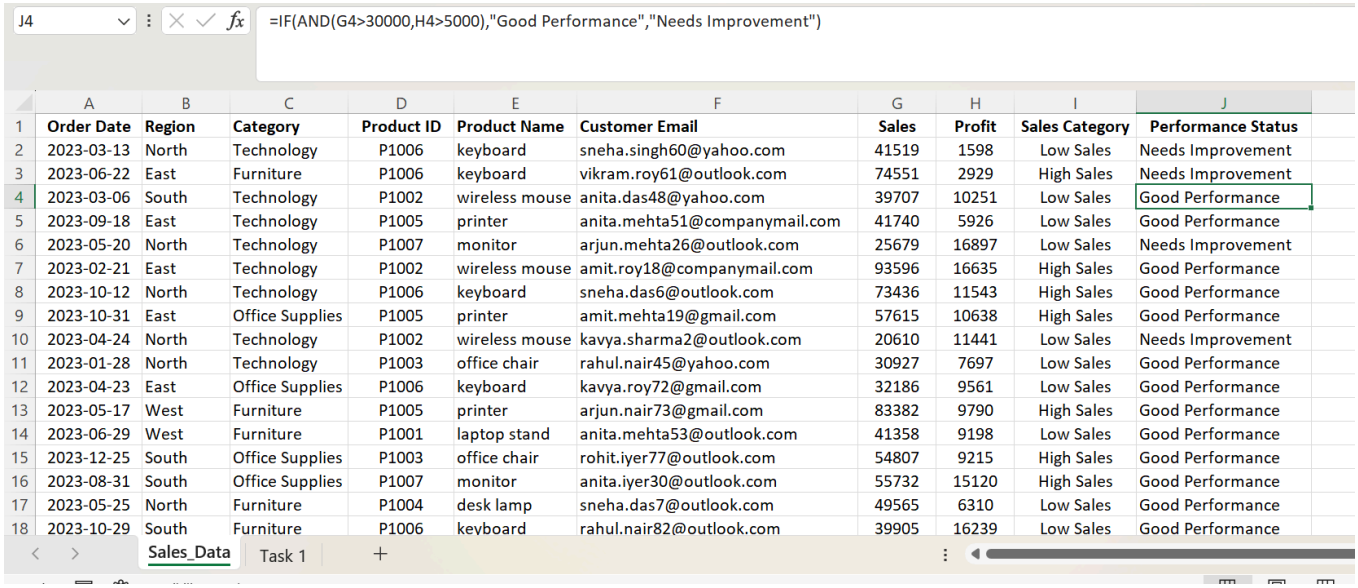
Explanation:
The IF() formula is copied down the Sales Category column to classify all records consistently.

Insight:
Applying the logic across the dataset ensures uniform categorization and enables meaningful comparison of sales records.

2.2: Performance Evaluation using IF() with AND() Function

Explanation:
The IF() function combined with the AND() function evaluates performance based on multiple conditions involving Sales and Profit values.

Insight:
This approach enables multi-dimensional performance assessment rather than relying on a single metric.



J4 =IF(AND(G4>30000,H4>5000),"Good Performance","Needs Improvement")

	A	B	C	D	E	F	G	H	I	J
1	Order Date	Region	Category	Product ID	Product Name	Customer Email	Sales	Profit	Sales Category	Performance Status
2	2023-03-13	North	Technology	P1006	keyboard	sneha.singh60@yahoo.com	41519	1598	Low Sales	Needs Improvement
3	2023-06-22	East	Furniture	P1006	keyboard	vikram.roy61@outlook.com	74551	2929	High Sales	Needs Improvement
4	2023-03-06	South	Technology	P1002	wireless mouse	anita.das48@yahoo.com	39707	10251	Low Sales	Good Performance
5	2023-09-18	East	Technology	P1005	printer	anita.mehta51@companymail.com	41740	5926	Low Sales	Good Performance
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Sales_Data Task 1

Analysis-

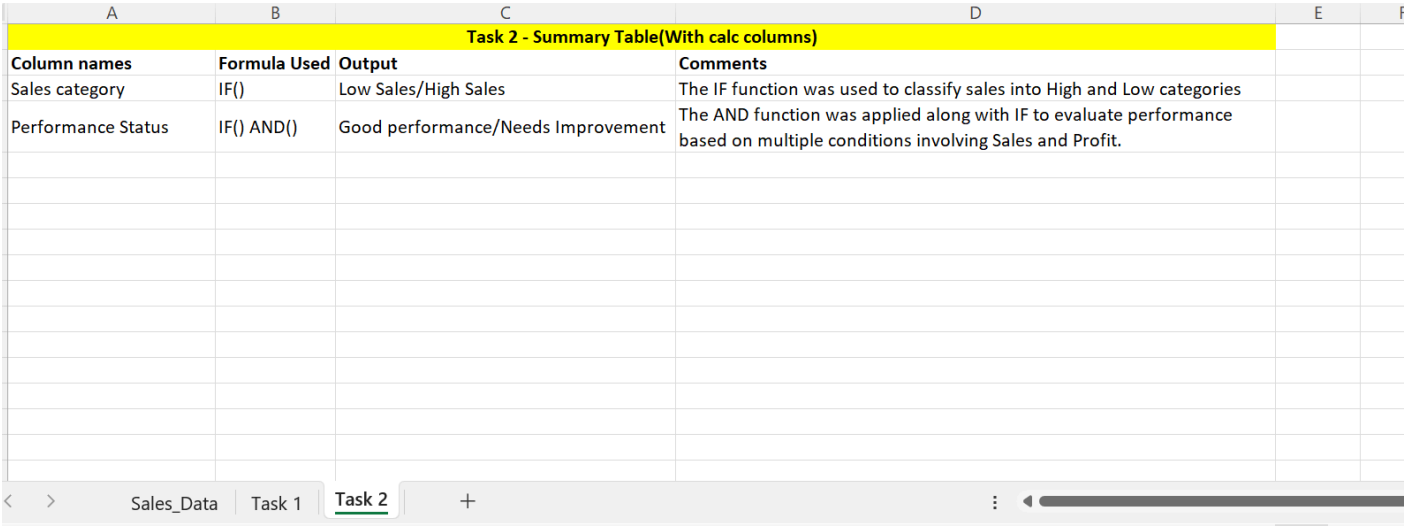
Explanation:
The combined IF and AND logic is applied to all records to generate performance labels such as *Good Performance* and *Needs Improvement*.

Insight:
This helps identify transactions that meet both revenue and profitability criteria, supporting better decision-making.

2.3: Task 2 Summary Table (Calculated Columns)

Explanation:
A summary table is created to document the logical columns added, formulas used, and their corresponding outputs.

Insight:
The summary table provides a clear overview of the applied logic and improves readability and documentation quality.



Task 2 - Summary Table(With calc columns)			
Column names	**Formula Used**	**Output**	**Comments**
Sales category	IF()	Low Sales/High Sales	The IF function was used to classify sales into High and Low categories
Performance Status	IF() AND()	Good performance/Needs Improvement	The AND function was applied along with IF to evaluate performance based on multiple conditions involving Sales and Profit.

Summary of Task 2

Task 2 demonstrates the use of logical functions to transform raw sales data into meaningful business classifications. These calculated fields enhance data interpretation and form a strong foundation for further analysis and visualization.

Task 3: Data Cleaning and Data Preparation

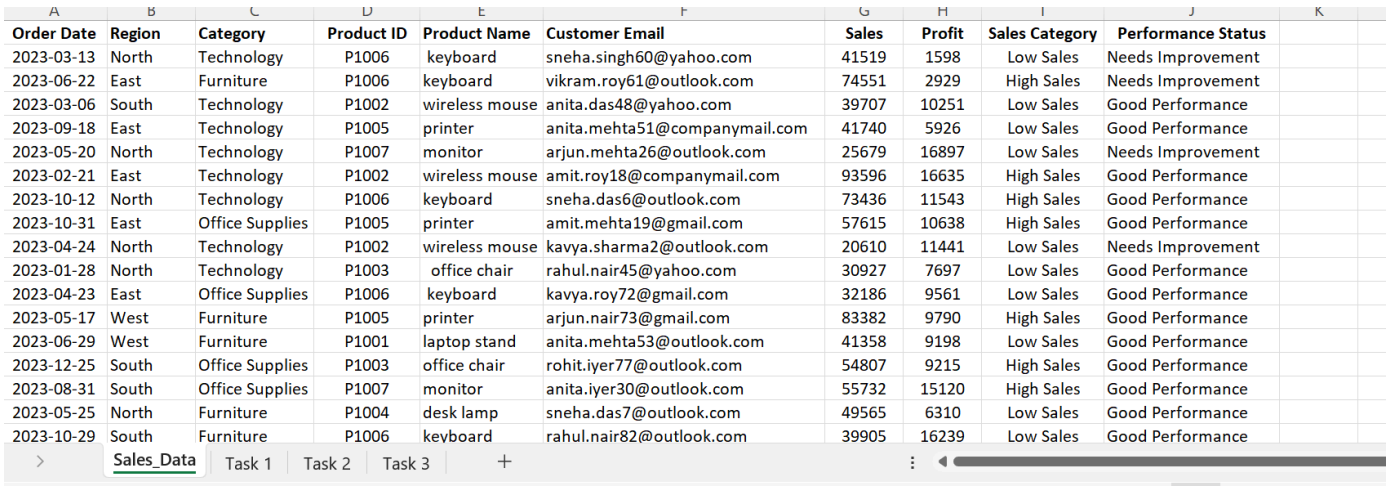
Objective of Task 3

The objective of Task 3 is to clean and standardize the dataset to ensure accuracy, consistency, and readiness for analysis. This task focuses on improving text formatting, checking for duplicate records, and restructuring data fields to enhance data quality.

3.1: Dataset Before Data Cleaning

Explanation:
This screenshot shows the original dataset before applying any data cleaning operations. Text fields such as Product Name contain inconsistent capitalization and spacing.

Insight:
Unclean text data can lead to inconsistencies in analysis and reporting, making data cleaning a critical preprocessing step.



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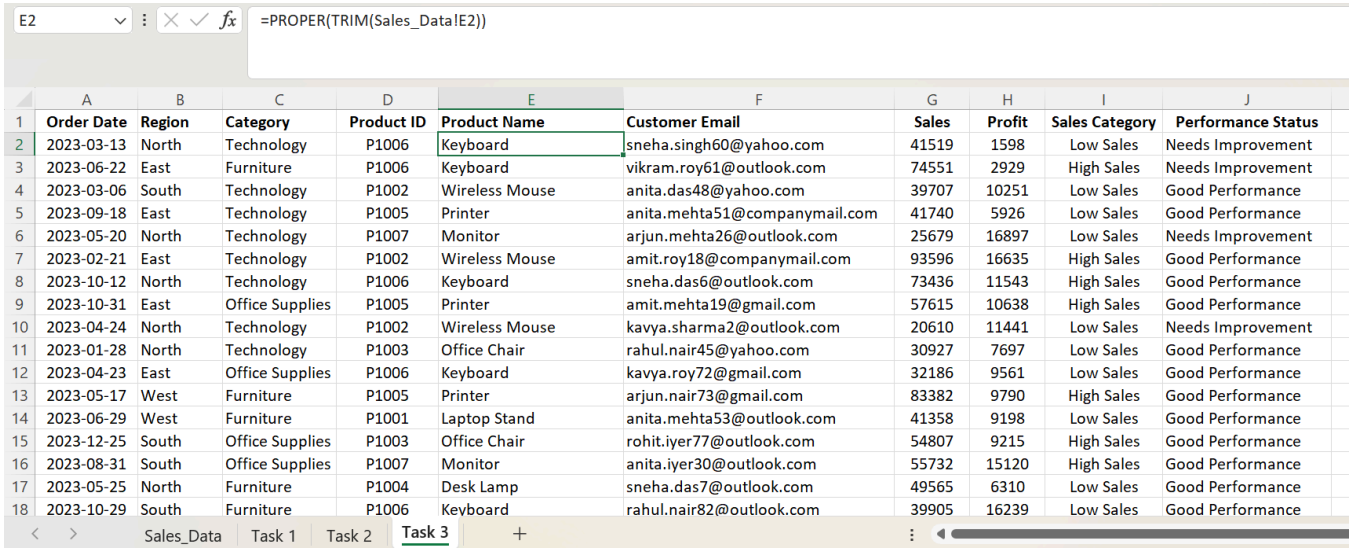
Sales_Data | Task 1 | Task 2 | Task 3

3.2: Dataset After Applying TRIM() and PROPER() Functions

Explanation:
The TRIM() and PROPER() functions are applied to the Product Name column to remove extra spaces and standardize text capitalization.

Insight:
Standardized text improves readability, ensures consistency, and prevents duplication issues during grouping and analysis.



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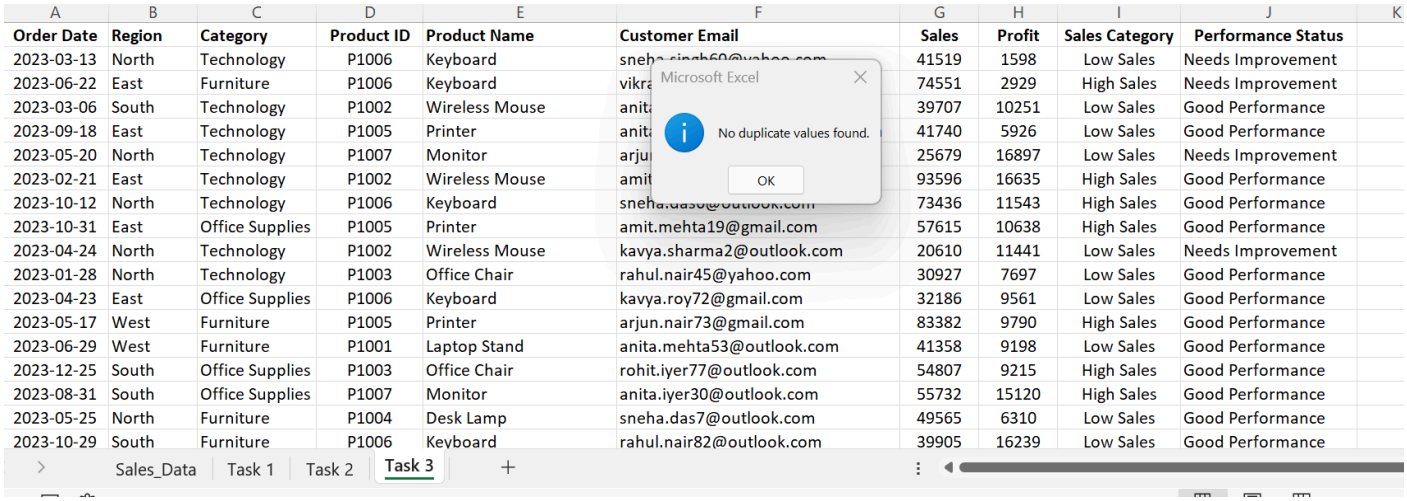
3.3: Duplicate Records Check Using Remove Duplicates

Explanation:
The dataset is checked for duplicate records using Excel's Remove Duplicates feature, and no duplicate values are found.

Insight:
This confirms data integrity and ensures that each record represents a unique transaction.



3.4: Splitting Customer Email using Text to Columns

Explanation:
The Text to Columns feature is used to split the Customer Email field into Email Username and Email Domain.

Insight:
Separating email components enables more granular analysis, such as domain-based customer insights and segmentation.

Before-

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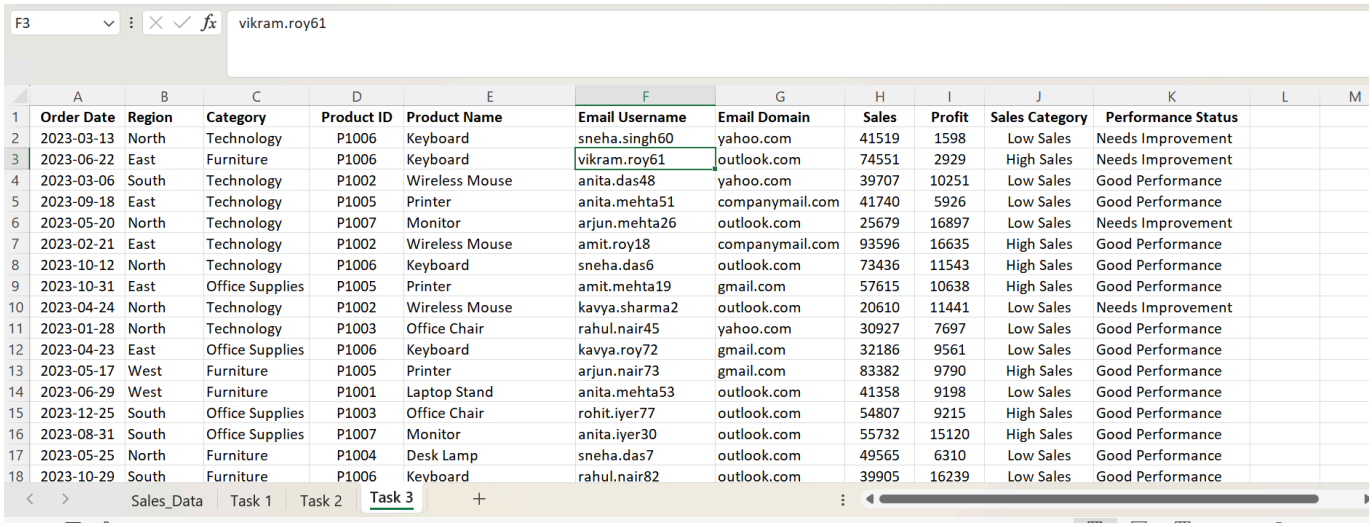
Sales_Data | Task 1 | Task 2 | Task 3

After-



Order Date	Region	Category	Product ID	Product Name	Email Username	Email Domain	Sales	Profit	Sales Category	Performance Status
2023-03-13	North	Technology	P1006	Keyboard	sneha.singh60	yahoo.com	41519	1598	Low Sales	Needs Improvement
2023-06-22	East	Furniture	P1006	Keyboard	vikram.roy61	outlook.com	74551	2929	High Sales	Needs Improvement
2023-03-06	South	Technology	P1002	Wireless Mouse	anita.das48	yahoo.com	39707	10251	Low Sales	Good Performance
2023-09-18	East	Technology	P1005	Printer	anita.mehta51	companymail.com	41740	5926	Low Sales	Good Performance
2023-05-20	North	Technology	P1007	Monitor	arjun.mehta26	outlook.com	25679	16897	Low Sales	Needs Improvement
2023-02-21	East	Technology	P1002	Wireless Mouse	amit.roy18	companymail.com	93596	16635	High Sales	Good Performance
2023-10-12	North	Technology	P1006	Keyboard	sneha.das6	outlook.com	73436	11543	High Sales	Good Performance
2023-10-31	East	Office Supplies	P1005	Printer	amit.mehta19	gmail.com	57615	10638	High Sales	Good Performance
2023-04-24	North	Technology	P1002	Wireless Mouse	kavya.sharma2	outlook.com	20610	11441	Low Sales	Needs Improvement
2023-01-28	North	Technology	P1003	Office Chair	rahul.nair45	yahoo.com	30927	7697	Low Sales	Good Performance
2023-04-23	East	Office Supplies	P1006	Keyboard	kavya.roy72	gmail.com	32186	9561	Low Sales	Good Performance
2023-05-17	West	Furniture	P1005	Printer	arjun.nair73	gmail.com	83382	9790	High Sales	Good Performance
2023-06-29	West	Furniture	P1001	Laptop Stand	anita.mehta53	outlook.com	41358	9198	Low Sales	Good Performance
2023-12-25	South	Office Supplies	P1003	Office Chair	rohit.iyer77	outlook.com	54807	9215	High Sales	Good Performance
2023-08-31	South	Office Supplies	P1007	Monitor	anita.iyer30	outlook.com	55732	15120	High Sales	Good Performance
2023-05-25	North	Furniture	P1004	Desk Lamp	sneha.das7	outlook.com	49565	6310	Low Sales	Good Performance
2023-10-29	South	Furniture	P1006	Keyboard	rahul.nair82	outlook.com	39905	16239	Low Sales	Good Performance

Sales_Data | Task 1 | Task 2 | Task 3

Summary of Task 3

Task 3 ensures that the dataset is clean, standardized, and structured for further analysis. By improving text formatting, validating uniqueness, and reorganizing data fields, the dataset becomes more reliable and suitable for advanced analysis and visualization.

Task 4: Lookup and Date Functions

Objective of Task 4

The objective of Task 4 is to enhance the dataset by using lookup and date functions. This task focuses on retrieving related information from existing data using a lookup table and extracting meaningful time-based attributes (Month and Year) from the order date to support time-series analysis.

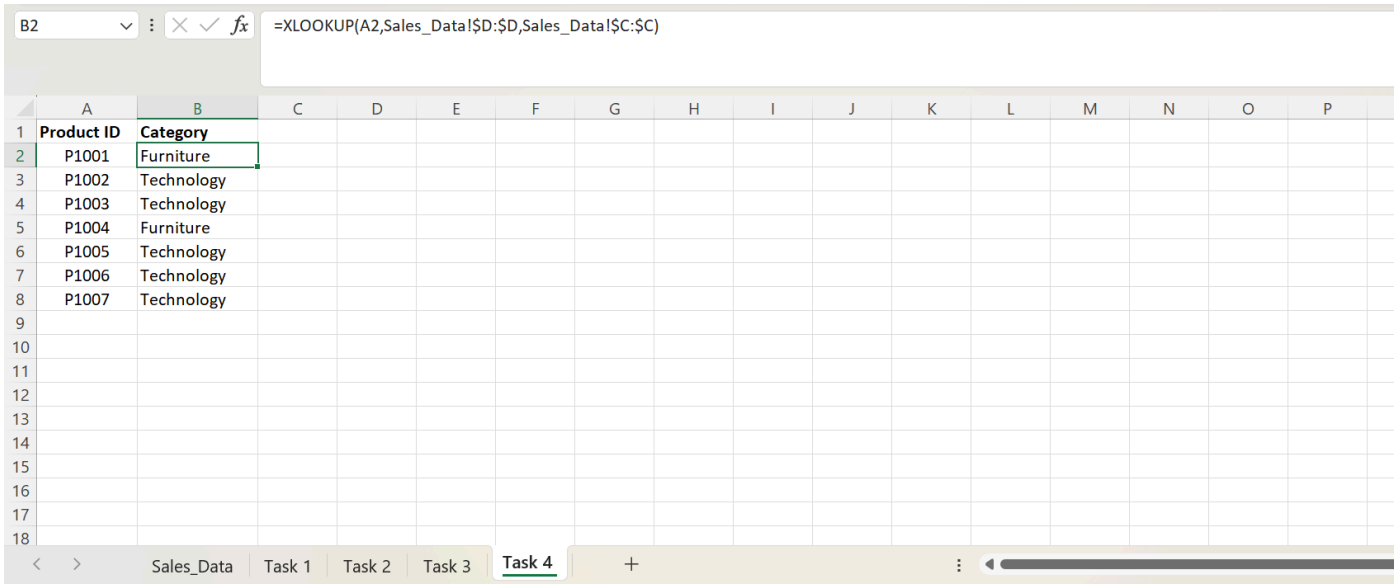
4.1: Category Lookup using XLOOKUP()

Why Xlookup instead of Vlookup

XLOOKUP returns the first matching value. Since Product ID appeared multiple times with different categories in the raw data, a separate lookup table with unique Product IDs was created to ensure accurate category mapping. Also XLOOKUP is more flexible than VLOOKUP as it runs in any direction.

Explanation:
A lookup table is created, and the XLOOKUP() function is used to fetch the Category corresponding to each Product ID from the main sales dataset.

Insight:
This ensures consistent product categorization and eliminates manual mapping errors, improving data accuracy and reliability.

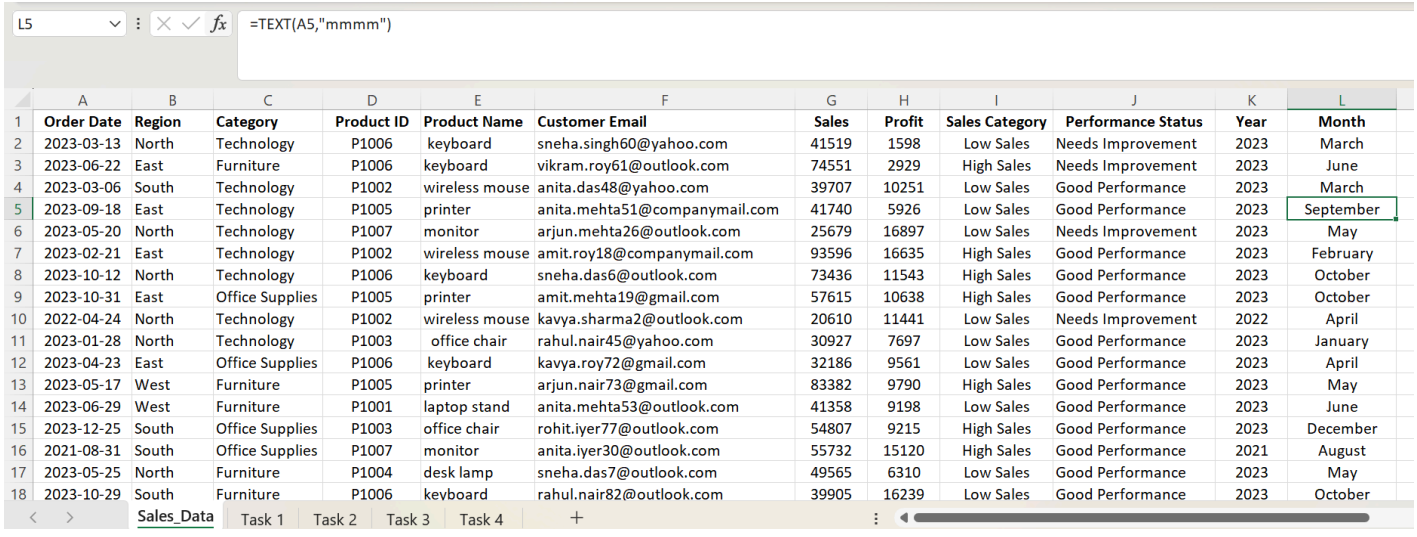


Product ID	Category
P1001	Furniture
P1002	Technology
P1003	Technology
P1004	Furniture
P1005	Technology
P1006	Technology
P1007	Technology

4.2: Extraction of Month from Order Date using TEXT()

Explanation:
The TEXT() function is applied to the Order Date column to extract the month name for each transaction.

Insight:
Extracting the month enables month-wise trend analysis and supports time-based reporting and visualization.

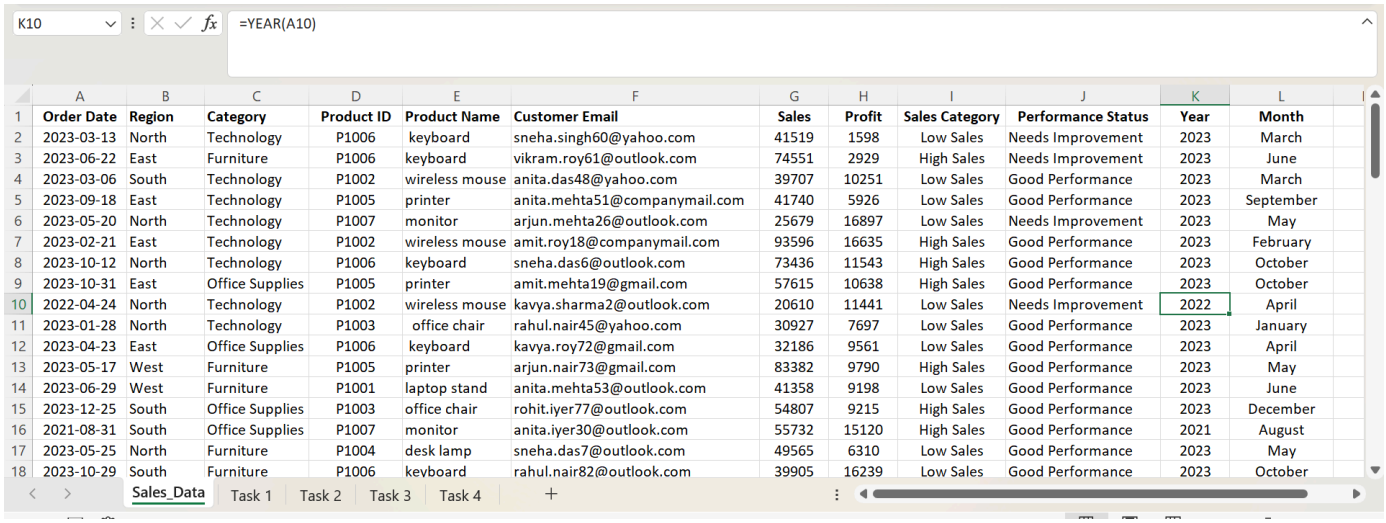


Order Date	Region	Category	Product ID	Product Name	Customer Email	Sales	Profit	Sales Category	Performance Status	Year	Month
2023-03-13	North	Technology	P1006	keyboard	sneha.singh60@yahoo.com	41519	1598	Low Sales	Needs Improvement	2023	March
2023-06-22	East	Furniture	P1006	keyboard	vikram.roy61@outlook.com	74551	2929	High Sales	Needs Improvement	2023	June
2023-03-06	South	Technology	P1002	wireless mouse	anita.das48@yahoo.com	39707	10251	Low Sales	Good Performance	2023	March
2023-09-18	East	Technology	P1005	printer	anita.mehta51@companymail.com	41740	5926	Low Sales	Good Performance	2023	September
2023-05-20	North	Technology	P1007	monitor	arjun.mehta26@outlook.com	25679	16897	Low Sales	Needs Improvement	2023	May
2023-02-21	East	Technology	P1002	wireless mouse	amit.roy18@companymail.com	93596	16635	High Sales	Good Performance	2023	February
2023-10-12	North	Technology	P1006	keyboard	sneha.das6@outlook.com	73436	11543	High Sales	Good Performance	2023	October
2023-10-31	East	Office Supplies	P1005	printer	amit.mehta19@gmail.com	57615	10638	High Sales	Good Performance	2023	October
2022-04-24	North	Technology	P1002	wireless mouse	kavya.sharma2@outlook.com	20610	11441	Low Sales	Needs Improvement	2022	April
2023-01-28	North	Technology	P1003	office chair	rahul.nair45@yahoo.com	30927	7697	Low Sales	Good Performance	2023	January
2023-04-23	East	Office Supplies	P1006	keyboard	kavya.roy72@gmail.com	32186	9561	Low Sales	Good Performance	2023	April
2023-05-17	West	Furniture	P1005	printer	arjun.nair73@gmail.com	83382	9790	High Sales	Good Performance	2023	May
2023-06-29	West	Furniture	P1001	laptop stand	anita.mehta53@outlook.com	41358	9198	Low Sales	Good Performance	2023	June
2023-12-25	South	Office Supplies	P1003	office chair	rohit.iyer77@outlook.com	54807	9215	High Sales	Good Performance	2023	December
2021-08-31	South	Office Supplies	P1007	monitor	anita.iyer30@outlook.com	55732	15120	High Sales	Good Performance	2021	August
2023-05-25	North	Furniture	P1004	desk lamp	sneha.das7@outlook.com	49565	6310	Low Sales	Good Performance	2023	May
2023-10-29	South	Furniture	P1006	keyboard	rahul.nair82@outlook.com	39905	16239	Low Sales	Good Performance	2023	October

Figure 4.3: Extraction of Year from Order Date using YEAR()

Explanation:
The YEAR() function is used to extract the year value from the Order Date field.

Insight:
This allows data to be grouped and analyzed across different years, enabling historical and comparative analysis.



	A	B	C	D	E	F	G	H	I	J	K	L
1	Order Date	Region	Category	Product ID	Product Name	Customer Email	Sales	Profit	Sales Category	Performance Status	Year	Month
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Sales_Data | Task 1 | Task 2 | Task 3 | Task 4

Summary of Task 4

Task 4 enriches the dataset by linking related information through lookup functions and adding time-based attributes. These enhancements are essential for structured analysis, pivot table creation, and dashboard development.

Task 5 – Pivot Tables & Pivot Charts Analysis

Objective of Task 5

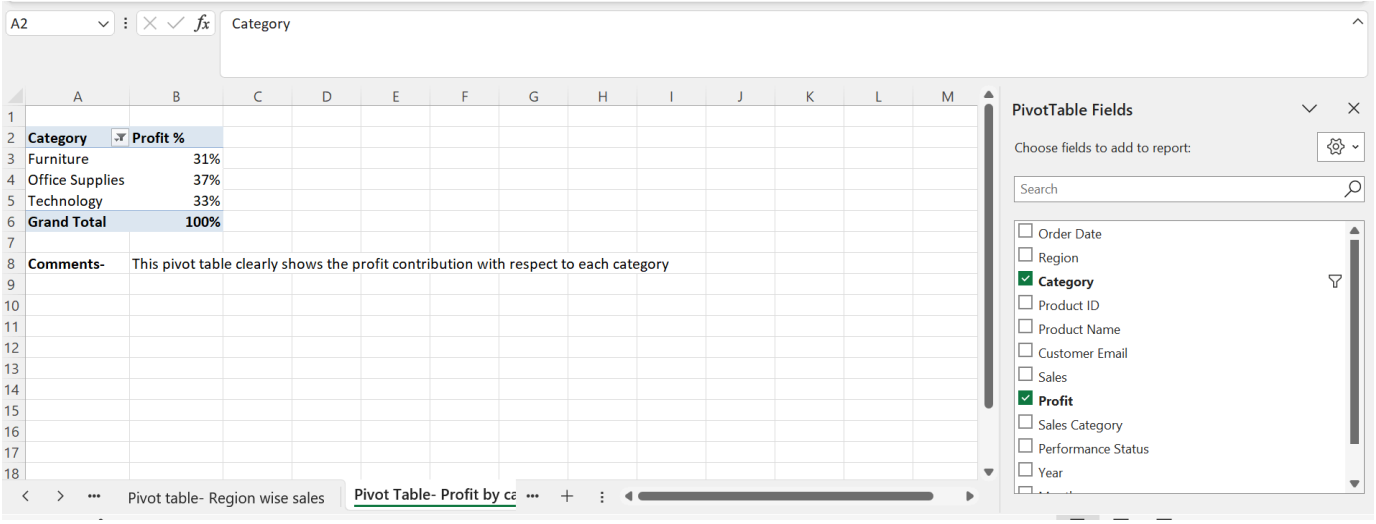
The objective of Task 5 is to summarize large sales data using Pivot Tables and visually analyze trends and comparisons using Pivot Charts. This task helps convert raw transactional data into meaningful business insights for decision-making.

5.1 – Pivot Tables

5.1.1: Pivot Table – Profit % by Category

Purpose:
To analyze how total profit is distributed across different product categories.

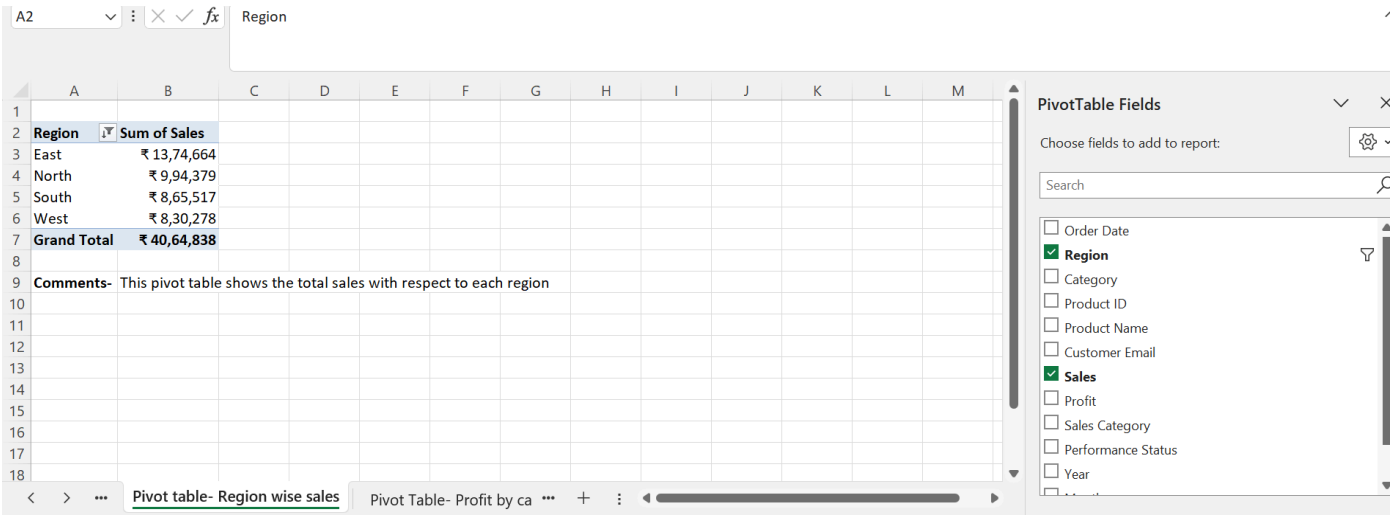
Insight:
This pivot table shows that Office Supplies contribute the highest profit percentage (37%), followed by Technology (33%) and Furniture (31%), helping identify the most profitable category.



5.1.2: Pivot Table – Total Sales by Region

Purpose:
To calculate and compare total sales performance across different regions.

Insight:
The pivot table highlights that the East region generates the highest sales, while West has the lowest, providing clarity on regional sales strengths and improvement areas.

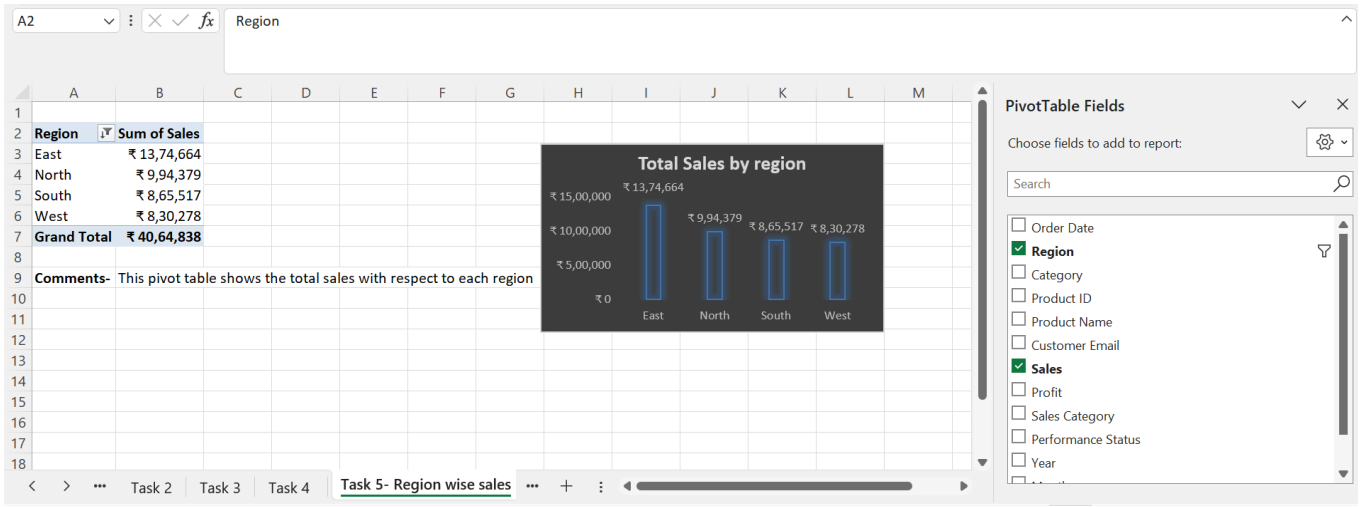


5.2 – Pivot Charts

5.2.1: Pivot Chart – Total Sales by Region

Purpose:
To visually represent regional sales distribution for easy comparison.

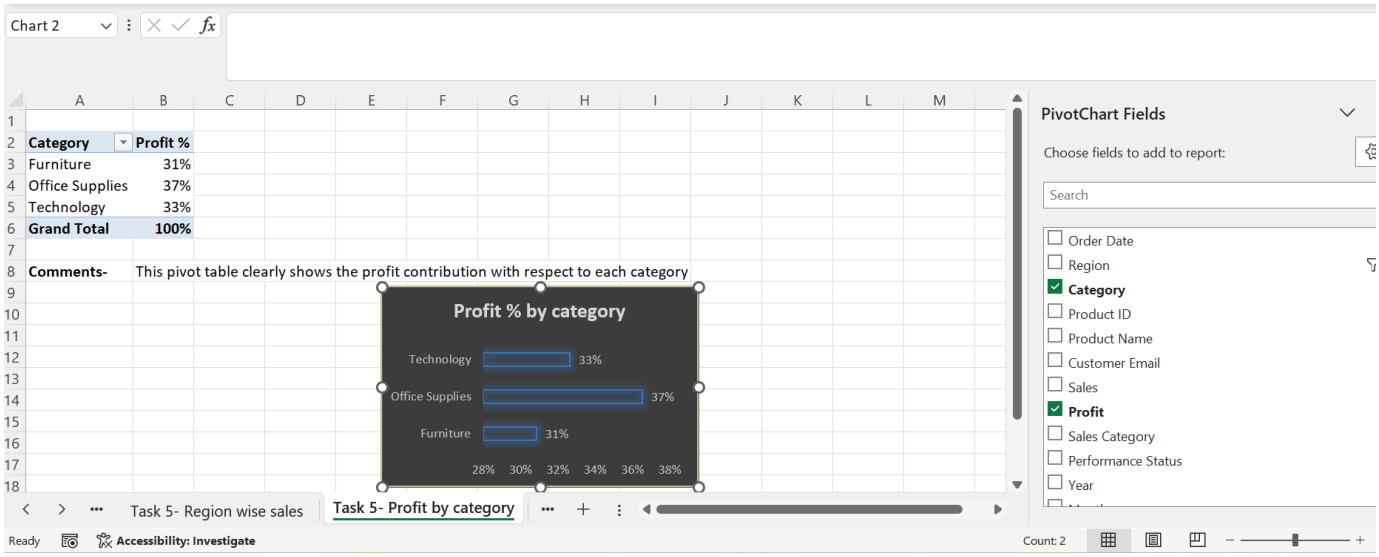
Insight:
The column chart clearly shows East leading in sales, followed by North, while South and West show comparatively lower performance, making regional trends instantly understandable.



5.2.2: Pivot Chart – Profit % by Category

Purpose:
To visualize profit contribution by category using a graphical format.

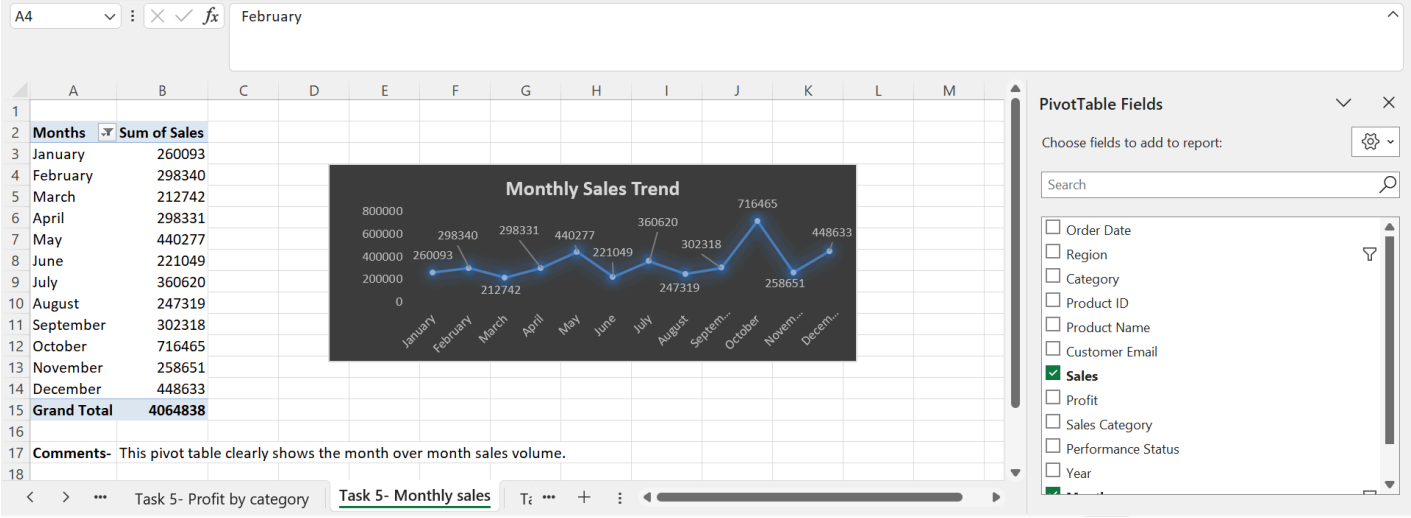
Insight:
This chart confirms that Office Supplies is the most profitable category, while Furniture contributes the least, reinforcing insights derived from the pivot table.



5.2.3: Pivot Chart – Monthly Sales Trend (Additional chart I added for dashboard purposes)

Purpose:
To analyze month-over-month sales performance throughout the year.

Insight:
The line chart reveals sales fluctuations across months, with October showing the highest sales peak, helping identify seasonality and demand patterns.



Months	Sum of Sales
January	260093
February	298340
March	212742
April	298331
May	440277
June	221049
July	360620
August	247319
September	302318
October	716465
November	258651
December	448633
Grand Total	4064838

Comments- This pivot table clearly shows the month over month sales volume.

Overall Business Insight from Task 5

Pivot Tables and Pivot Charts together enable quick identification of:

- Top-performing regions and categories
- Profit contribution patterns
- Seasonal sales trends

This analysis supports data-driven decision-making by transforming raw sales data into clear, actionable insights.

Task 6 – Sales Performance Dashboard Analysis

Objective of Task 6

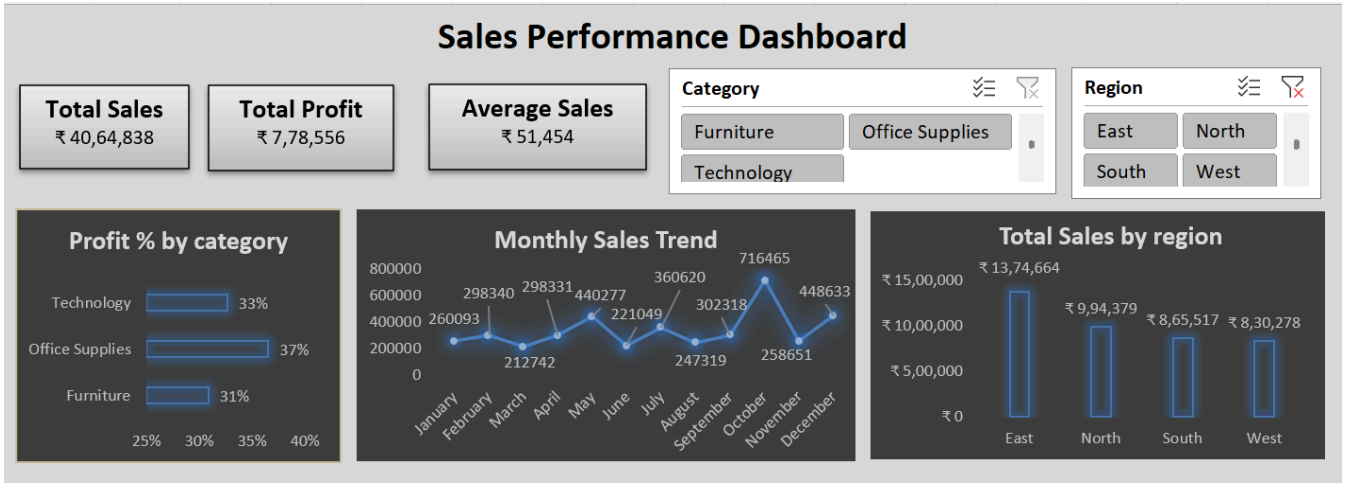
The objective of Task 6 is to design an interactive Sales Performance Dashboard that consolidates key metrics, trends, and comparisons into a single view. This dashboard enables stakeholders to monitor performance, identify patterns, and take data-driven business decisions efficiently.

Dashboard Overview

The dashboard integrates:

- **Key Performance Indicators (KPIs):** Total Sales, Total Profit, and Average Sales
- **Interactive slicers** for Category and Region
- **Visual insights through charts** on profit distribution, monthly trends, and regional performance

All elements are dynamically connected, allowing real-time analysis based on user selection.



Key Findings from the Dashboard

1. Overall Sales & Profit Performance

- **Total Sales:** ₹40,64,838
- **Total Profit:** ₹7,78,556
- **Average Sales per Order:** ₹51,454

Insight:
The business demonstrates strong overall revenue generation with healthy average order value, indicating stable customer purchasing behavior.

2. Profit Contribution by Category

- **Office Supplies:** 37% (Highest)
- **Technology:** 33%
- **Furniture:** 31% (Lowest)

Insight:
Office Supplies emerge as the most profitable category, suggesting higher margins or consistent demand, while Furniture contributes comparatively lower profit.

3. Monthly Sales Trend Analysis

- Sales show fluctuations throughout the year
- October records the highest sales peak
- Lower sales observed in months like March and June

Insight:
The trend highlights seasonality in sales, indicating peak demand periods that can be strategically leveraged through targeted promotions.

4. Regional Sales Performance

- **East region:** Highest sales (₹13,74,664)
- **North region:** Second highest performer
- **South & West:** Moderate but lower sales contribution

Insight:
The East region is the strongest revenue contributor, while South and West regions represent potential growth opportunities.

5. Interactivity & Filtering Insights

- Category and Region slicers dynamically update KPIs and charts
- Enables focused analysis such as region-specific category performance

Insight:
Interactive filtering enhances decision-making by allowing stakeholders to drill down into specific segments without manual recalculations.

Business Recommendations

1. Strengthen High-Performing Categories

- Invest more in Office Supplies through inventory expansion and promotions
- Maintain Technology category growth with innovation and bundling strategies

2. Improve Underperforming Regions

- Introduce targeted marketing campaigns in South and West regions
- Analyze regional customer preferences to optimize product mix

3. Leverage Seasonal Peaks

- Plan sales campaigns and discounts around high-performing months like October
- Prepare inventory and logistics in advance for peak demand periods

4. Use Dashboard for Ongoing Monitoring

- Regularly track KPIs to detect early performance drops
- Use slicers for quick management-level reviews and strategy adjustments

Overall Conclusion

The Sales Performance Dashboard successfully transforms complex sales data into clear, actionable insights. It supports strategic planning, performance monitoring, and business optimization, making it a powerful tool for both operational and managerial decision-making.

Task 7 – Conceptual Questions and Answers

18. Why is Excel still widely used in Data Analytics?

- Excel is widely used because it provides a user-friendly interface for data analysis.
- It supports data cleaning, transformation, analysis, and visualization in one tool.
- Built-in functions like SUM, IF, VLOOKUP/XLOOKUP, and Pivot Tables allow fast analysis.
- Excel is ideal for small to medium datasets, which are common in business reporting.
- It enables quick creation of interactive dashboards using pivot charts and slicers.
- Excel is widely adopted across industries, making it a standard reporting tool.
- It allows analysts to perform analysis without advanced programming skills.

19. What is the difference between COUNT() and COUNTA()?

COUNT()

- Counts only cells that contain numeric values.
- Ignores text, blank cells, and logical values.

- Commonly used to count numerical records such as sales or quantities.

COUNTA()

- Counts all non-empty cells, including numbers, text, and symbols.
- Useful for checking total number of records in a dataset.
- Helps identify missing or incomplete data.

Note- *The key difference is that COUNT focuses only on numbers, while COUNTA counts all filled cells.*

20. What is a Pivot Table and why is it important?

- A Pivot Table is an Excel tool used to summarize large datasets quickly.
- It allows users to group data by category, region, date, or other fields.
- Pivot Tables perform calculations such as sum, average, count, and percentages automatically.
- They help in identifying patterns, trends, and outliers in data.
- Pivot Tables reduce dependency on complex formulas.
- They are important for business reporting and decision-making.
- Pivot Tables can be connected to charts and slicers to create interactive dashboards.

21. What are slicers and how do they help in dashboards?

- Slicers are visual filtering tools used with Pivot Tables and Pivot Charts.
- They allow users to filter data by Region, Category, Year, or other fields with a single click.
- Slicers make dashboards interactive and dynamic.
- They help non-technical users understand data easily.
- Slicers automatically update all connected pivot tables and charts.
- They improve dashboard usability and presentation quality.
- Slicers help in performing quick comparative analysis across different dimensions.

22. Why is data cleaning important before analysis?

- Data cleaning ensures that analysis is based on accurate and reliable data.
- It removes duplicate records, which can distort results.
- It fixes inconsistent formatting and spelling errors.
- Cleaning handles missing or blank values, preventing calculation errors.
- Functions like TRIM, PROPER, and Remove Duplicates improve data quality.
- Clean data leads to better insights and correct business decisions.
- Data cleaning is a critical step in real-world data analytics projects.