RETAIL PROFIT ANALYSIS

Presented By :- Rahil Deshmukh

AGENDA

What this report will cover

PURPOSE

Retail businesses face challenges in identifying key factors that drive profitability. Factors such as discounts, product categories, shipping modes, and regional performance often influence profit margins, but the relationships are not always clear. To remain competitive and optimize resources, businesses must analyze these factors effectively.

DATASET

01 Order Date : Date when the order was placed.

02 Ship Date : Date of shipment.

03 Ship Mode : Mode of Shipment.

04 Segment : The market segment.

05 Country : The country where the order was placed or shipped.

06 City : The city where the order was placed or shipped.

07 State : The state or province where the order was placed or shipped.

08 Region : The geographic region where the order was placed or shipped.

09 Category : The broader category of the product.

10 Sub-Category : The specific sub-category of the product.

DATASET

11 Product Name : The name of the specific product that was ordered.

12 Sales : The total sales revenue from the order.

13 Quantity : The number of units ordered.

14 Discount : The discount applied to the order, as a percentage (e.g., 0.1 for 10%).

15 Profit : The profit earned from the order.

DATA PRE-PROCESSING

01

02

03

04

05

Data Collection

Dealing With Unnecessary Columns

Dealing With Duplicate Values

Data Formatting

Data Sorting

Imported the data from a csv file to python.

Deleted columns which were not required for our project.

Deleted duplicate values from the dataset using df.drop_duplicates().

Formatted necessary data. For Example :- Convert dates data type to date-time format.

Sorted the dataset in ascending order with respect to Order date.
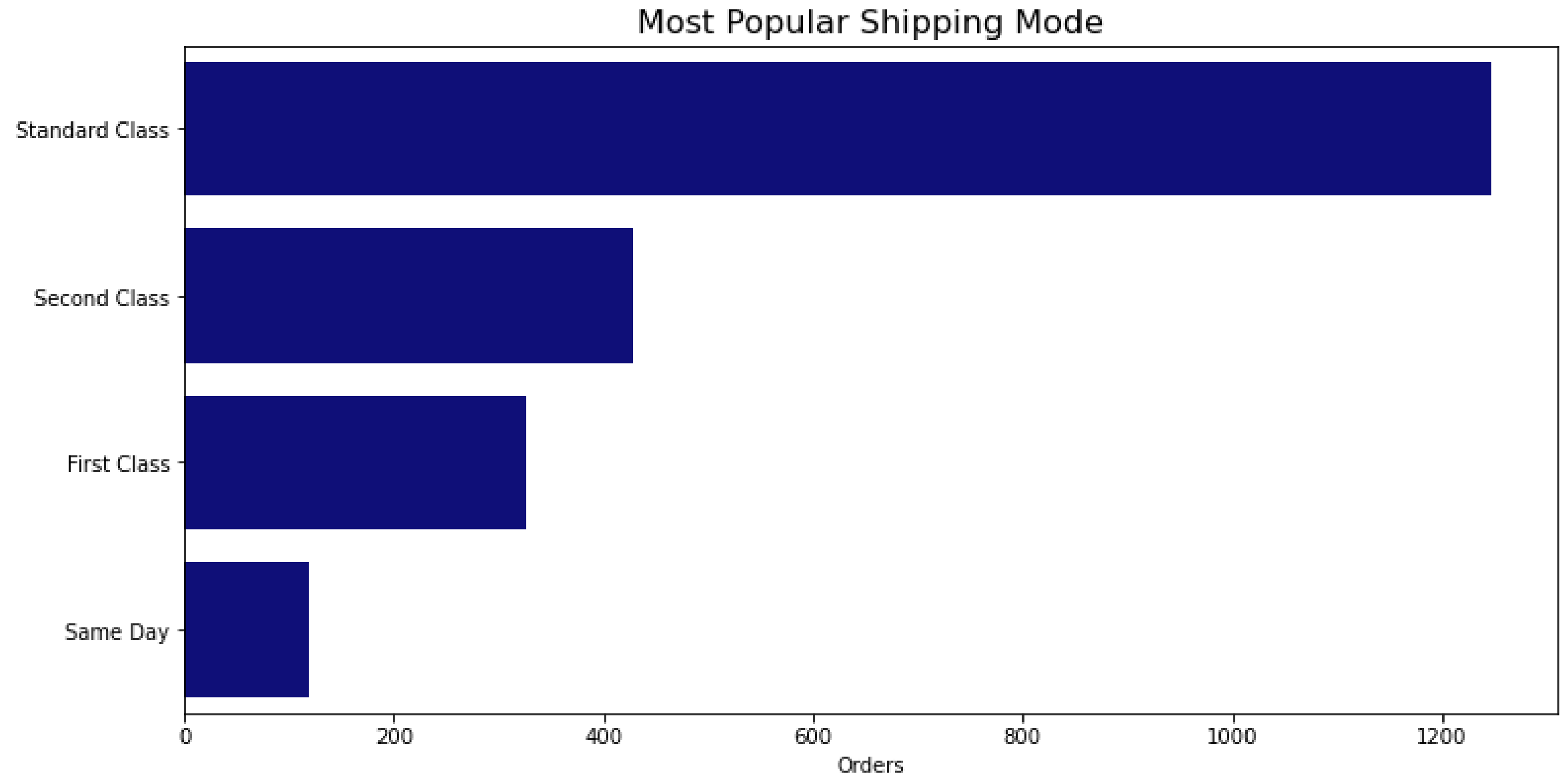
MOST POPULAR SHIPPING MODE

- The most popular shipping mode is Standard Class, with over 1200 orders.
- The least used shipping mode is Same Day, with less than 200 orders,.
- Second Class and First Class combined still have fewer orders than Standard Class alone, emphasizing the strong preference for Standard Class among customers.

Most Popular Shipping Mode

MOST POPULAR SEGMENT

- The Consumer segment is the most popular, with over 1,000 orders, significantly surpassing the Corporate and Home Office segments.
- The Corporate segment, with around 600 orders, is the second most popular segment, capturing a considerable portion of the total orders but still far behind the Consumer segment.
- The Home Office segment is the least popular, with approximately 400 orders, which is less than half the orders of the Consumer segment.

Most Popular Segment
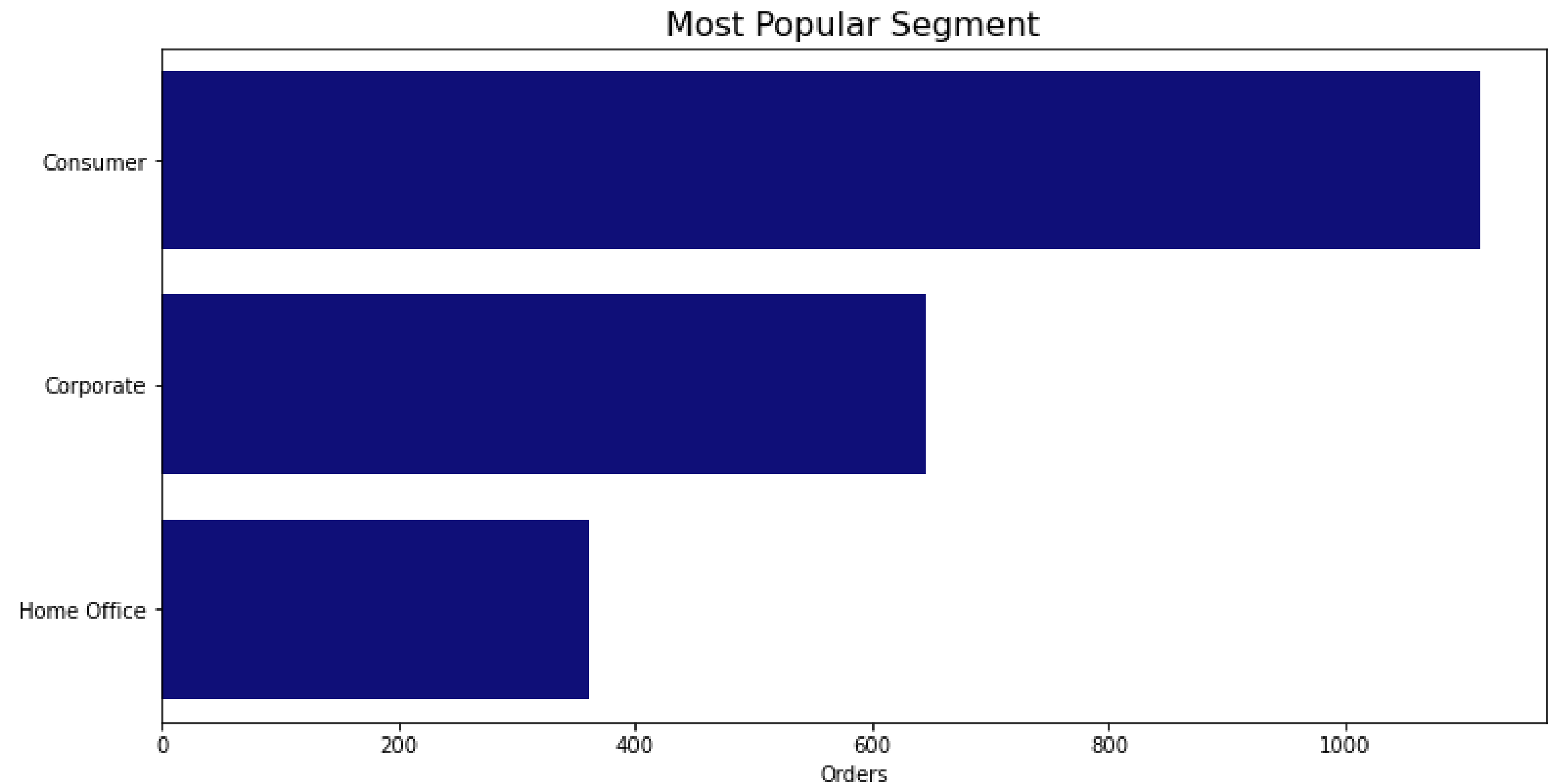
TOP 5 PERFORMING STATES AND CITIES

	State	Profit
2063	Vermont	1013.1270
1452	Minnesota	770.3520
1577	Kentucky	746.4078
1070	Michigan	700.9800
366	Wisconsin	673.8816

|	City	Profit
2063	Burlington	1013.1270
1452	Minneapolis	770.3520
1577	Henderson	746.4078
1070	Detroit	700.9800
366	Madison	673.8816

AVERAGE PROFIT PER REGION

- There is significant differences in mean profit across the regions. The South region shows the highest average profit ($20.39), while the Central region has the lowest mean profit (-$5.97), indicating potential losses.
- This ranking suggests that the South region is the most profitable, while the Central region is the least profitable.
- The difference in mean profit between the South and Central regions is substantial. This disparity suggests that factors like customer base, market dynamics, or operational efficiency may vary significantly across these regions.

|	Region	Mean Profit
1	South	20.395199
2	West	16.272914
3	East	5.068496
4	Central	-5.968918

PROFIT DISTRIBUTION

- Most orders generate little to no profit or loss.
- There are orders with significant losses or profits
- Limited variability in the profit data for the central 50% of orders.

Orders with IQR Markers
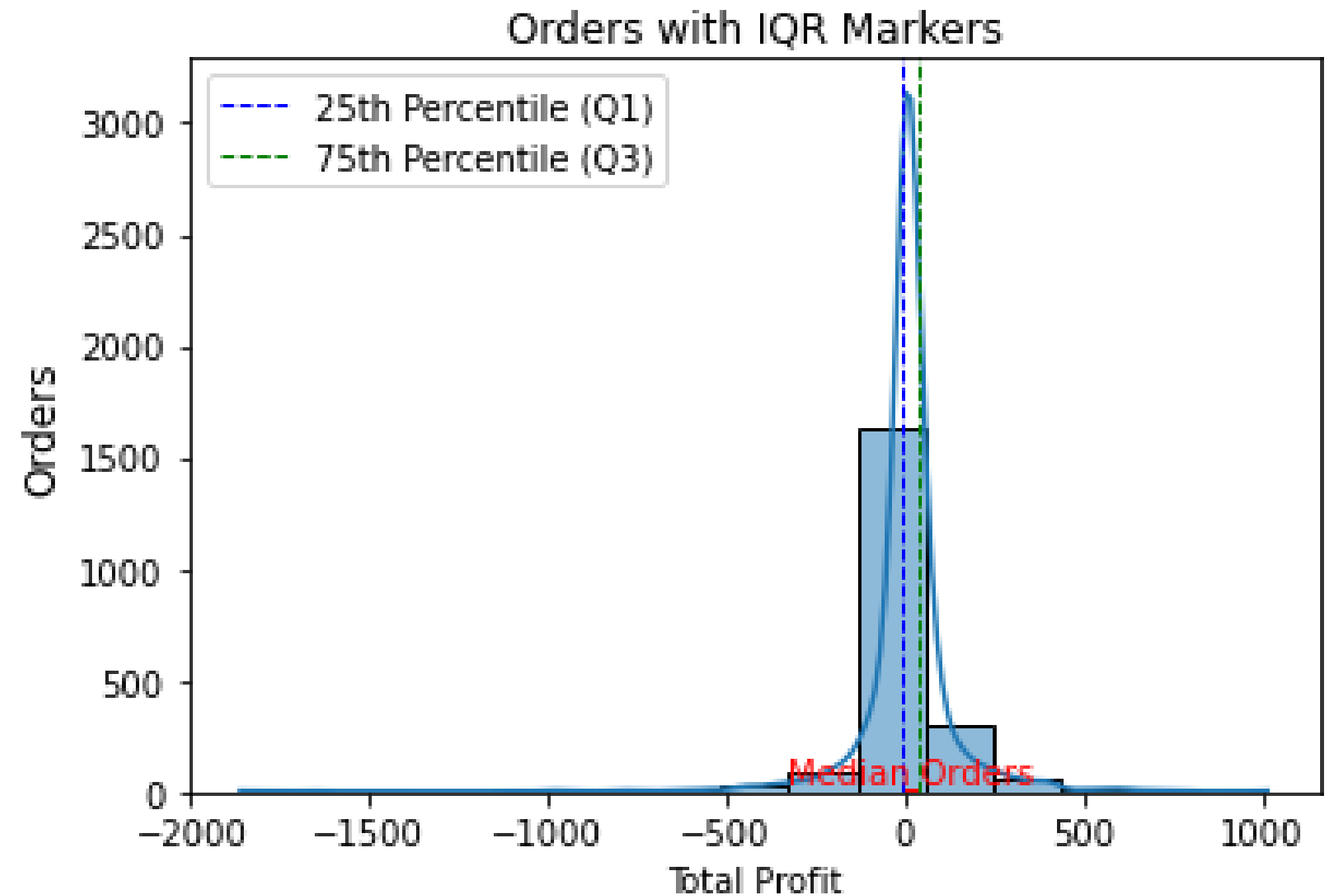
SUB-CATEGORY RESULTING IN MAXIMUM PROFIT

- The Chairs sub-category generates the highest profit, exceeding $20,000, making it a major contributor to overall profitability.
- The Tables sub-category stands out with a negative profit of approximately $-15,000, indicating potential issues such as over-discounting or high costs.
- The combined contribution of Chairs and Furnishings accounts for nearly 100% cumulative profit, highlighting their importance to the overall profitability.


Pareto Chart: Sub-Category vs Profit
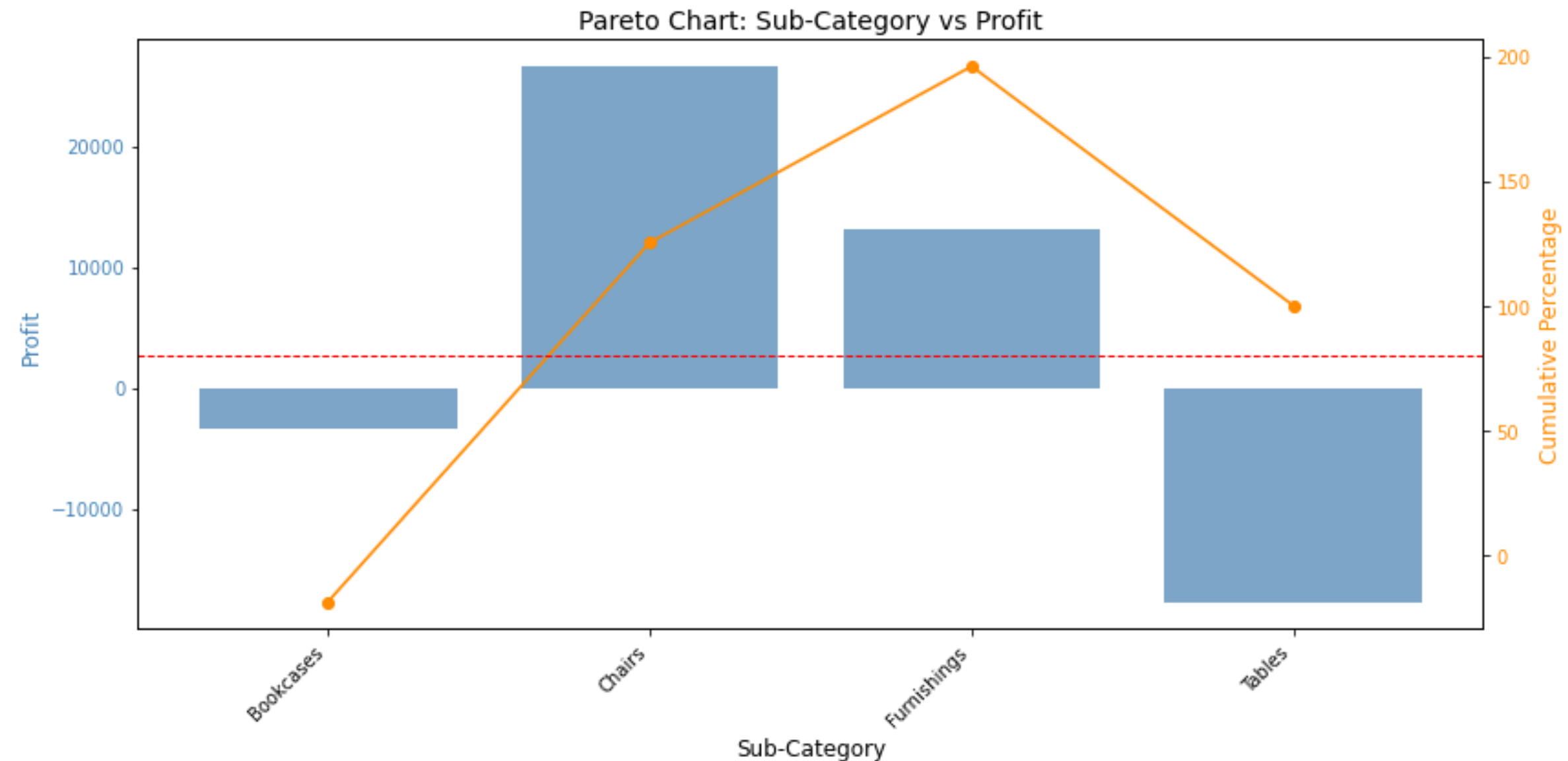
PROFIT V/S DISCOUNT

- There appears to be a negative correlation between discount and profit. This suggests that offering higher discounts generally leads to lower profits.
- The red line represents a regression line, which is a line that best fits the data points. The slope of this line is negative, further confirming the negative correlation between discount and profit.
- The outliers suggest that there might be other factors influencing profit besides just the discount.
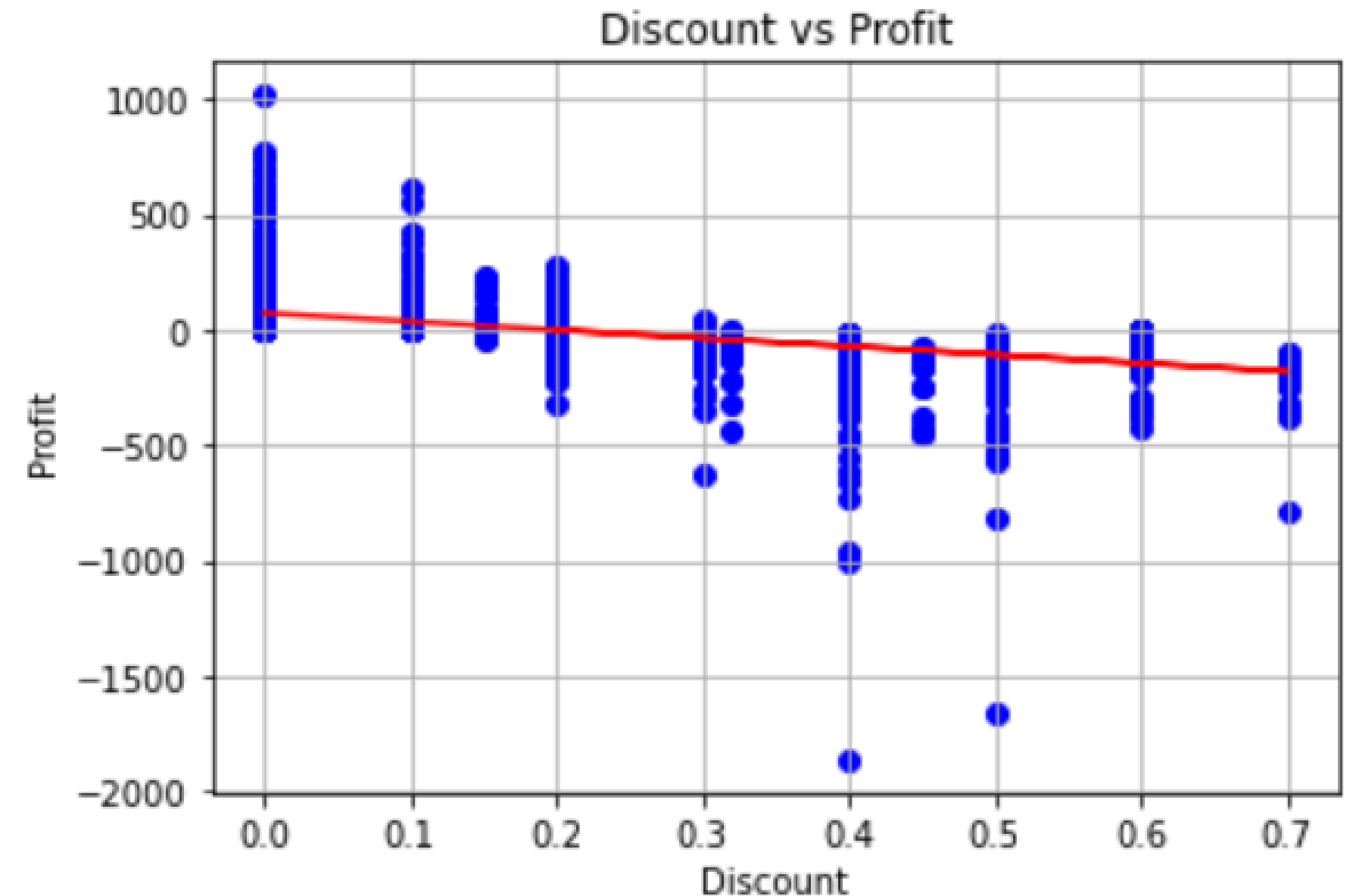
SALES V/S DISCOUNT

- Spearman Correlation: 0.093

- The low correlation values from Spearman Correlation Coefficient confirm that Sales and Discount are not strongly related in your dataset.

- Discounts might influence sales for specific product categories, customer types, or regions, which cannot be captured by simple correlation analysis.

Sales vs Discount
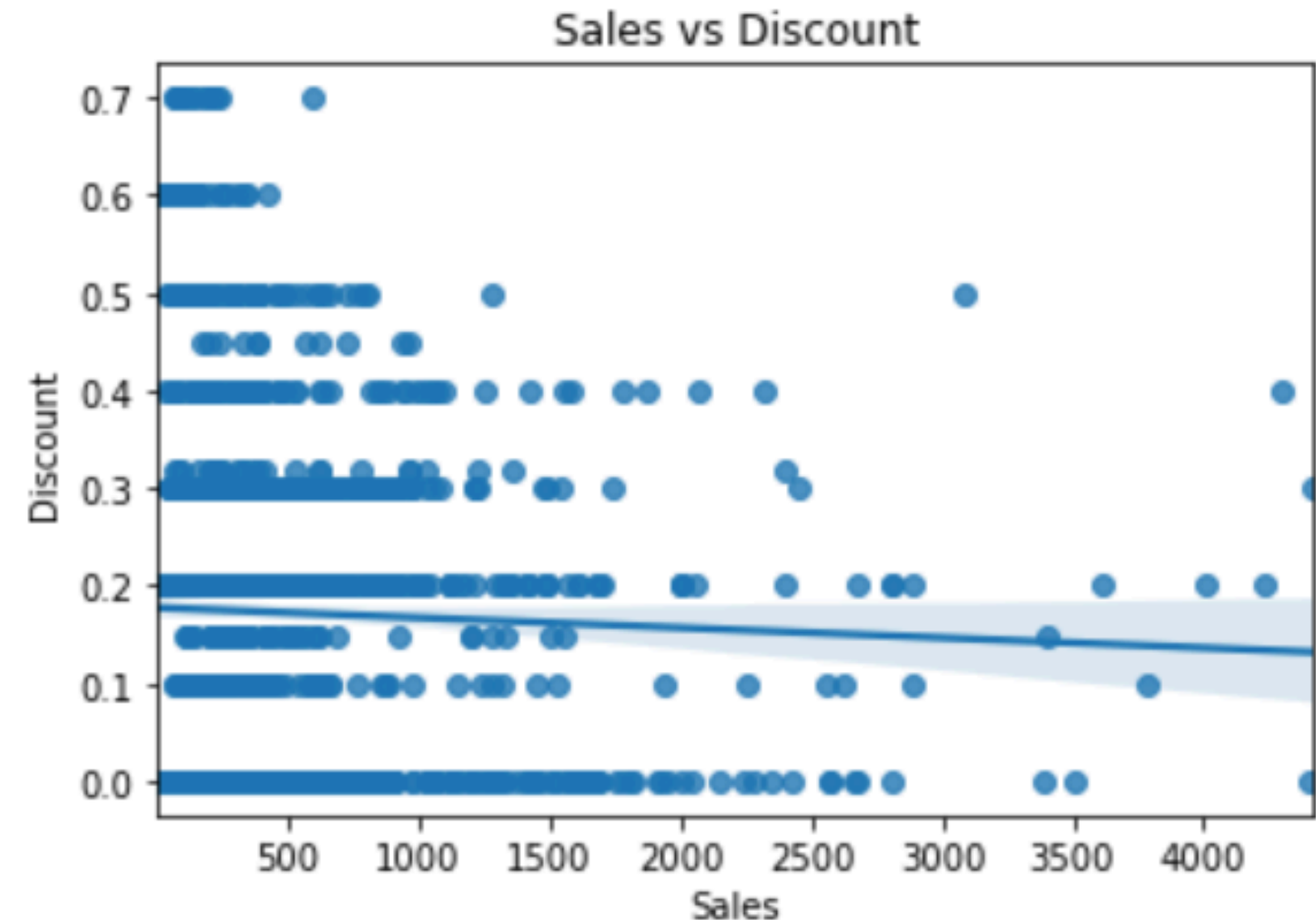
PROFIT TRENDS BY SUB-CATEGORY OVER TIME
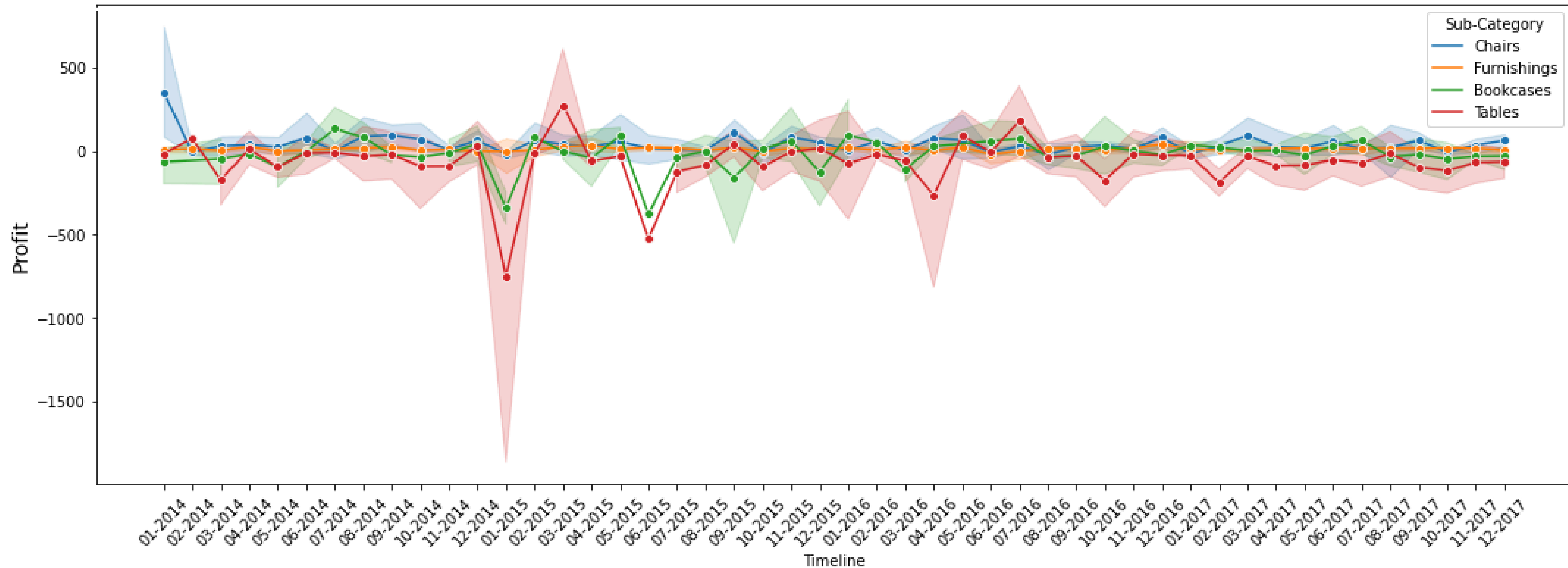
The profit for each sub-category shows significant fluctuations over the timeline. There isn't a consistent upward or downward trend for any of them.

PROFITIBILITY SEGMENTATION ANALYSIS OF SUB-CATEGORIES

	Sub-Category	Sales	Profit	Segment
1	Bookcases	114879.9963	-3472.5560	Low Sales Low Profit
2	Chairs	328167.7310	26602.2251	High Sales High Profit
3	Furnishings	91705.1640	13059.1436	Low Sales High Profit
4	Tables	206965.5320	-17725.4811	High Sales Low Profit

- The Chairs sub-category stands out with the highest sales ($328,167.73) and substantial profits ($26,602.23), making it a significant contributor to overall profitability. It highlights a well-performing category worth prioritizing in marketing and inventory strategies.
- Despite generating high sales ($206,965.53), the Tables sub-category incurs a notable loss (-$17,725.48). This suggests inefficiencies, possibly due to over-discounting, high costs, or unfavourable pricing strategies that require immediate attention.
- The Furnishings sub-category, though generating lower sales ($91,705.16), achieves a respectable profit ($13,059.14). This indicates strong profitability per unit sold and suggests potential for scaling up operations to maximize profit contributions.

CONCLUSION

01 Most orders generate little to no profit or loss.

02 The Consumer segment is the most profitable segment.

03 The Chairs sub-category generates the highest profit. While the Tables sub-category stands out with a negative profit, Indicating potential issues such as over-discounting or high costs.

04 There is no consistency in the overall profit of the company

05 Discounts negatively impacted profit margins, suggesting the need for pricing optimization.

FUTURE SCOPE

01 Perform a deeper analysis of customer demographics, purchasing behavior, and preferences to improve targeted marketing strategies.

02 Use machine learning models to forecast demand and sales trends with greater accuracy.

03 Include data like economic indicators, competitor pricing, and social trends to gain more holistic insights.

04 Explore integrating live data streams for dynamic analysis and decision-making.