

Ecommerce

Enhancing E-Commerce Strategies through Data Analytics

The Tableau ecommerce project focuses on analyzing and visualizing key aspects of ecommerce data to derive insights that drive business decisions and strategies. The project involves several stages, including data preparation, exploration, analysis, and visualization, leveraging Tableau's capabilities to create interactive dashboards and visualizations.

Customer Segmentation:

During the customer segmentation process, I categorized customers based on their total spending as follows:

- High spenders: Customers whose total spending exceeds \$8000.
- Medium spenders: Customers with total spending ranging between \$2000 and \$8000.
- Low spenders: Customers whose total spending falls below \$2000.

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IF [Total Spent] >= 8000 THEN 'High Spender'
ELSEIF [Total Spent] >= 2000 AND [Total Spent] < 8000 THEN 'Medium Spender'
ELSE 'Low Spender'
END
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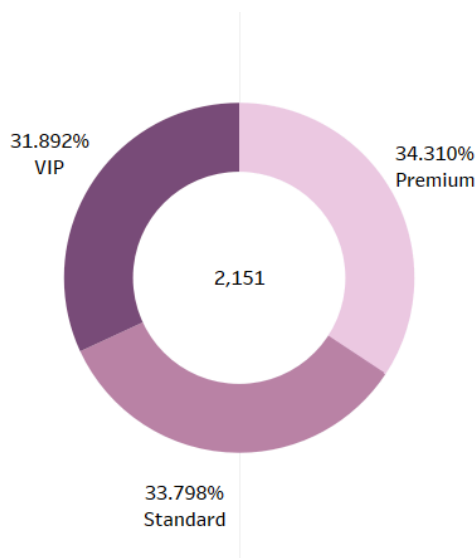
Calculated Field for Profit Margin:

In this topic, where I needed to calculate the profit margin based on unit price, I decided to use an average profit margin of 20%, which aligns with industry standards and research findings. Ecommerce profit margins typically range between 15% and 22%, making 20% a suitable estimate for this analysis.

Calculate the total revenue for each order:

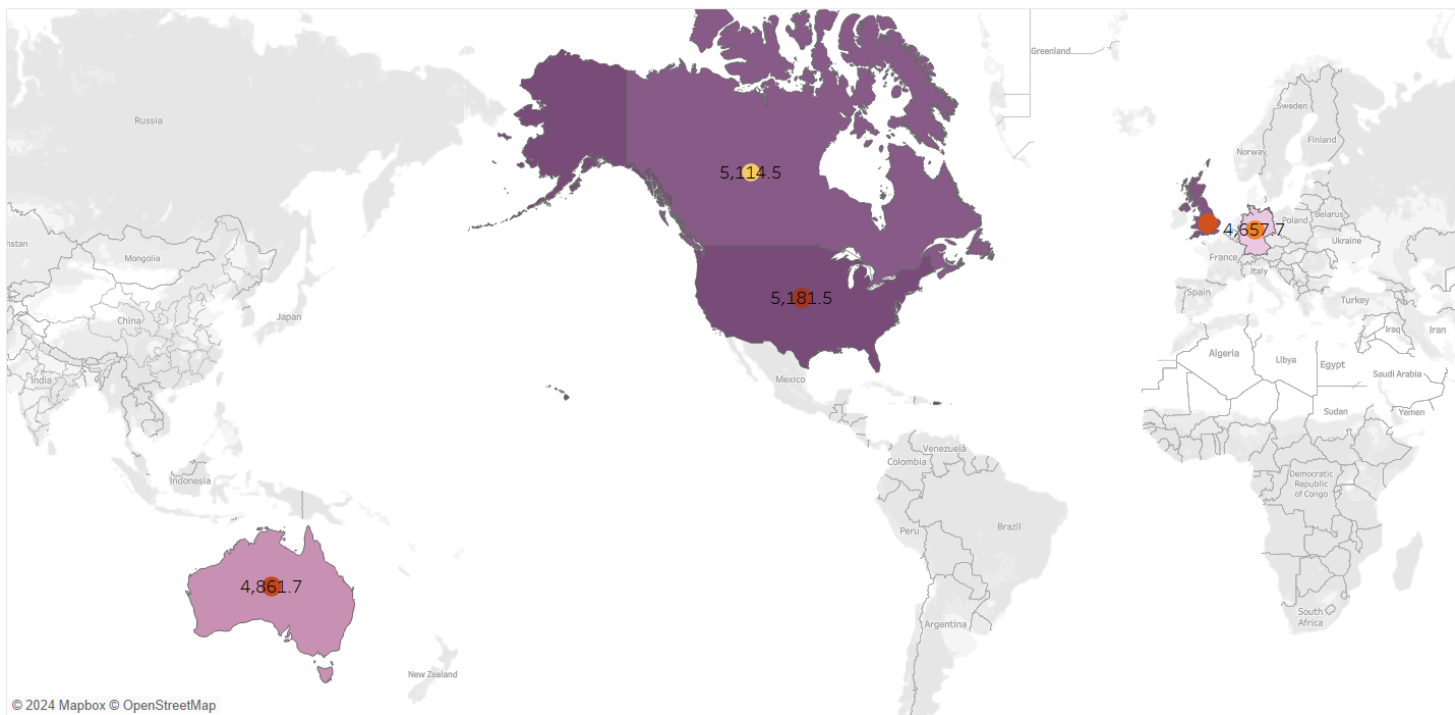
$$\text{Profit Margin} = \sum (\text{UnitPrice} \times \text{Quantity}) \times \text{MarginPercentage}$$

Analysis of Membership Type:



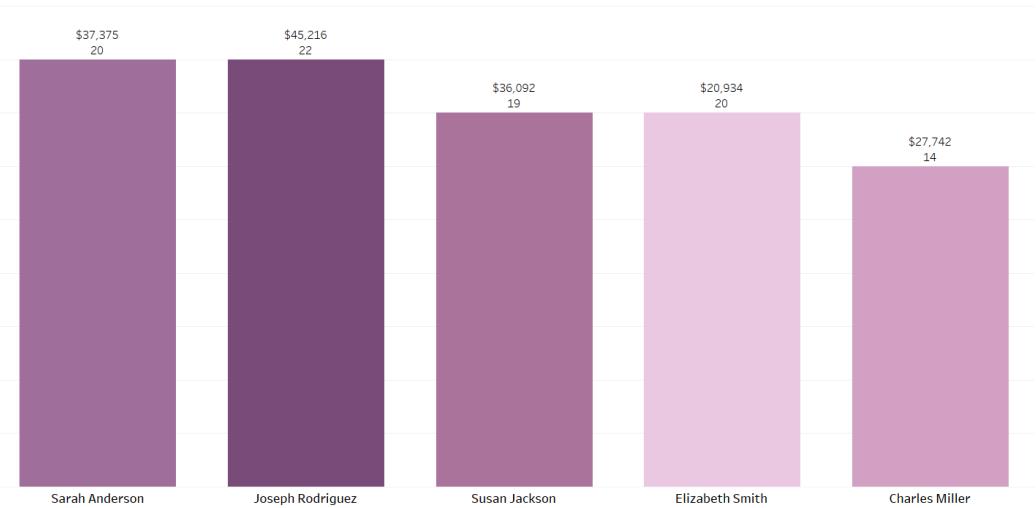
The analysis of membership types versus total orders reveals interesting insights. The donut chart indicates a relatively balanced distribution of total ordered units across membership types, totaling 2151 units. However, upon deeper examination, it becomes evident that the percentage of total orders varies across membership types. Premium members account for the highest number of orders, while VIP members place the fewest orders.

Country-Based Analysis:



Country-Based Analysis: Upon analyzing the map, it's evident that the average total spend is highest in the USA and lowest in Germany. However, an intriguing observation emerges when comparing Canada to the USA. While Canada's average spend is nearly on par with the USA, there's a significant difference in total ordered units. This suggests that Canadian customers tend to purchase more expensive items, indicating a potentially higher purchasing power or different spending habits influenced by their living standards.

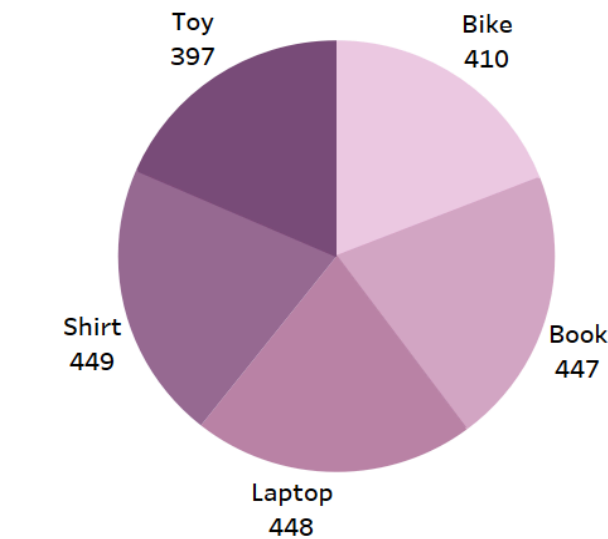
Order Frequency Analysis:



Upon analyzing the Order Frequency among customers, the top five frequent purchasers on the ecommerce platform are Sara Anderson, Joseph Rodriguez, Susan Jackson, Elizabeth Smith, and Charles Miller.

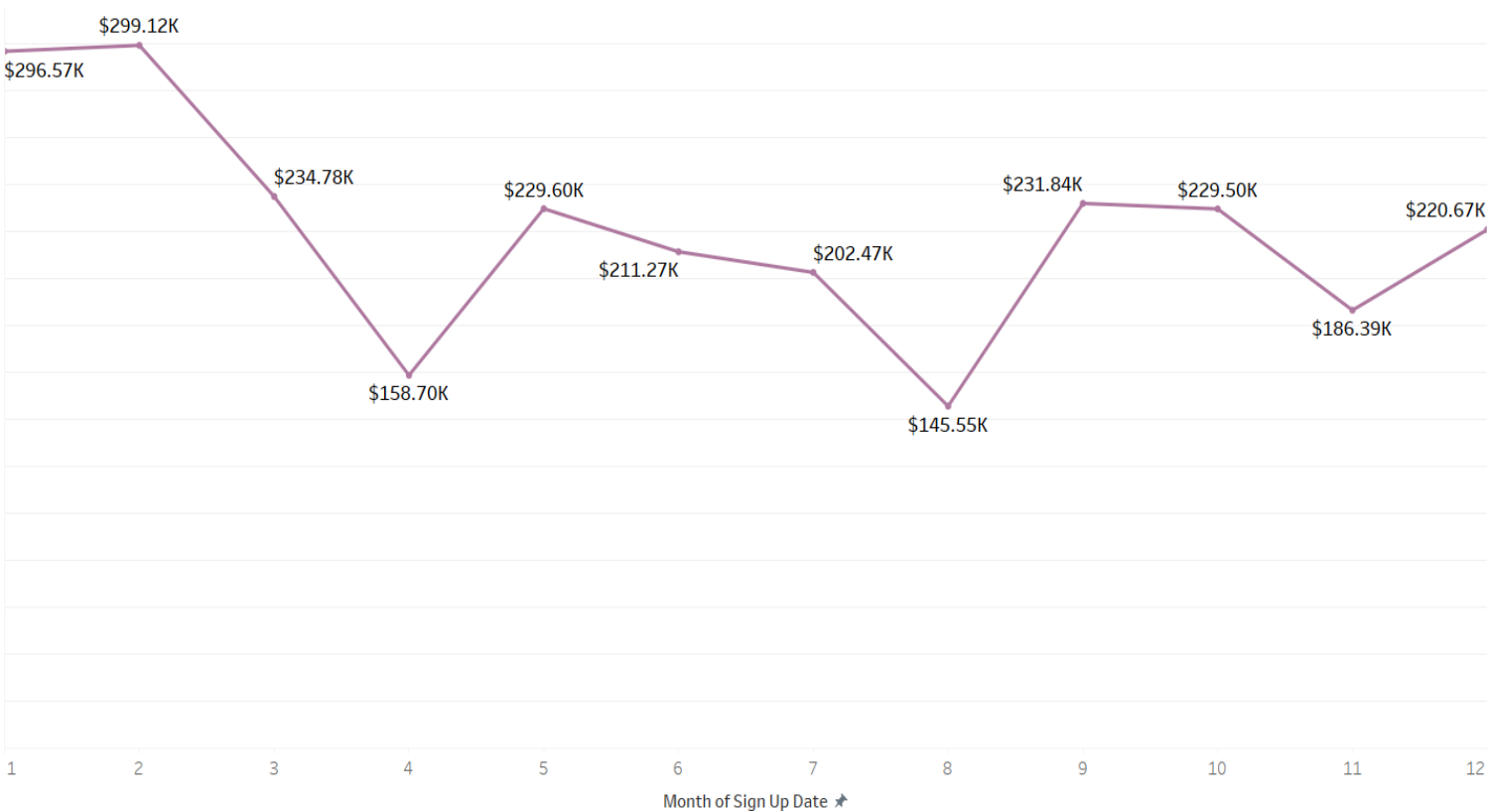
Interestingly, both Sara Anderson and Joseph Rodriguez made eight purchases each. However, Joseph Rodriguez stands out as he spent more money and ordered a higher quantity of units compared to Sara Anderson.

Product Popularity Analysis:



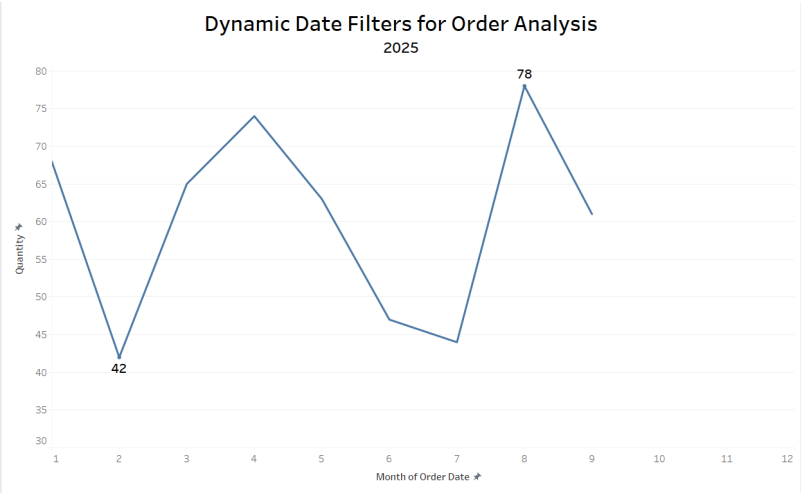
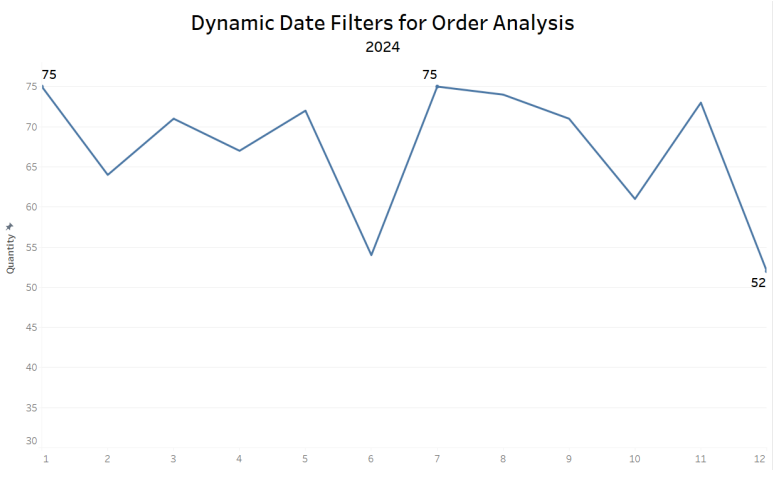
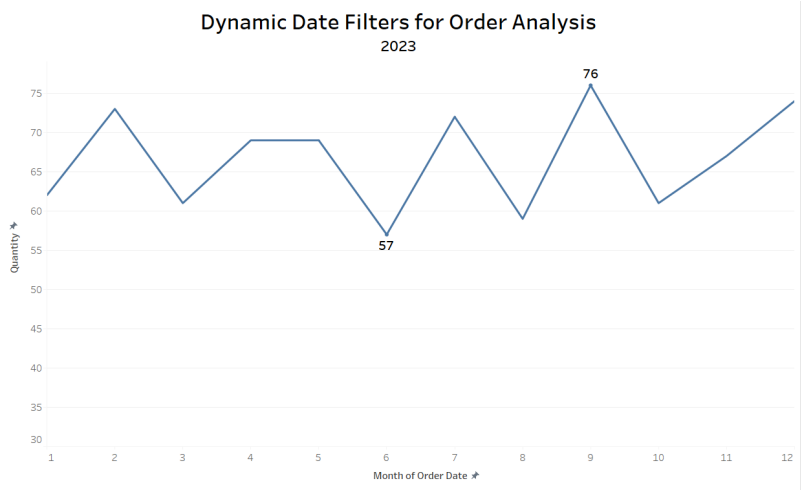
Upon analyzing the pie chart illustrating product popularity based on total quantity purchased, it appears that the distribution of products is evenly spread. However, upon closer examination of the numerical values, it is evident that shirts and laptops are the most frequently purchased items, while toys are the least purchased.

Cohort Analysis:



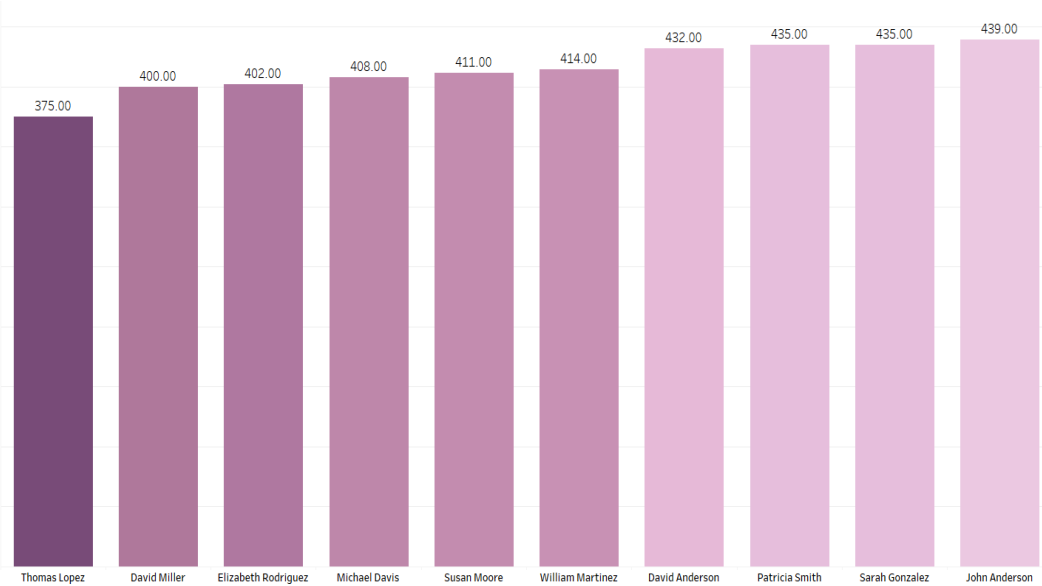
Upon conducting cohort analysis based on total spend per month from the date of signup, it is evident that February exhibits the highest total spend, amounting to approximately \$299.12K. Conversely, the months of August and April record the lowest total spend.

Dynamic Date Filters for Order Analysis:



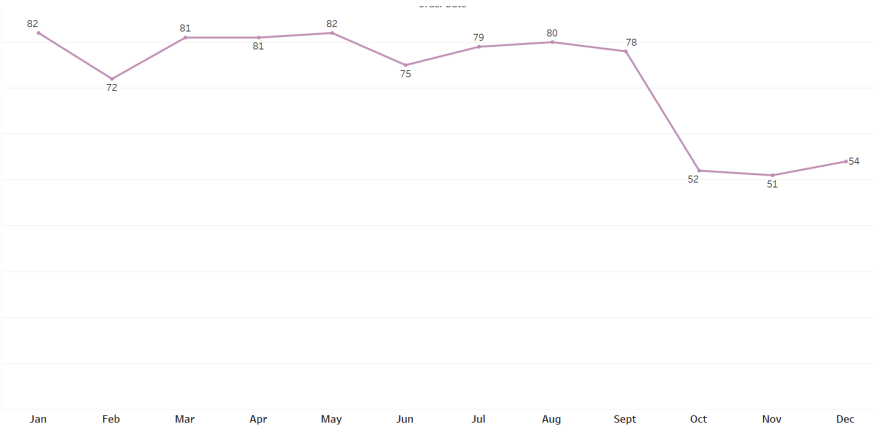
Upon analyzing the total orders per month per year, it is observed that the year 2023 demonstrates greater stability compared to others, with the highest number of ordered units occurring in September (76 units) and the lowest in June (57 units). Conversely, the year 2025 is characterized by instability, with the lowest total ordered units recorded in February (42 units).

Customer Tenure Calculation:



Upon analyzing customer tenure over the three-year period, it is observed that the lowest tenure is 375 days for a customer named Thomas Lopez. This indicates that Thomas Lopez made a purchase and remained a customer for a duration of 375 days. Additionally, David Williams has the highest tenure, which is 1109 days, indicating a longer duration of engagement with the platform.

Time-Series Analysis of Orders:



Upon analyzing the total orders per month, it is evident that the highest number of orders occurs in January and May. However, an intriguing observation is the gradual decrease in orders after September, particularly in the months of October, November, and December, where the average orders drop to around 50. This finding prompts further investigation into whether this decline is seasonal or attributable to other factors.

Aggregate Analysis of Shipping Cost:



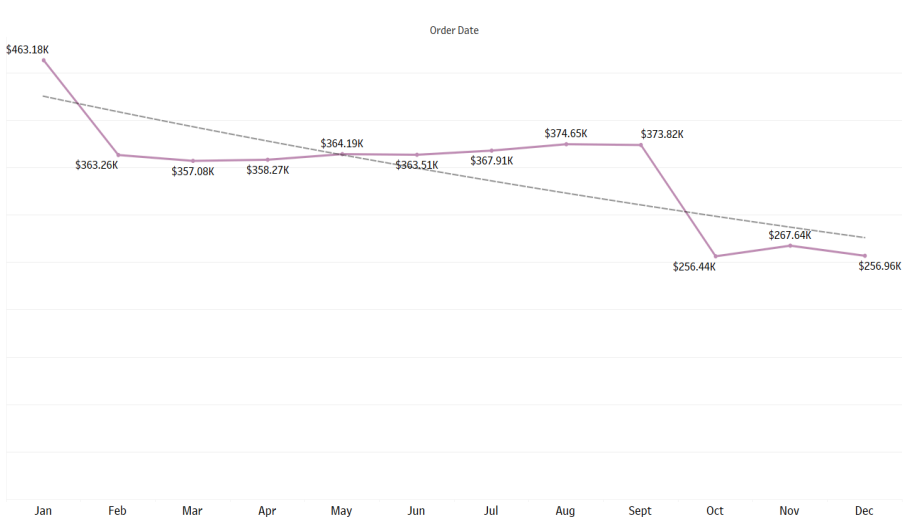
After conducting an aggregated analysis of shipping costs for various products, the graph reveals that the highest average shipping cost is associated with bikes, approximately \$58, while the lowest is observed for toys, approximately \$47.

Analysis of Customer Communication Logs:

@firstmsg	≡		
Inquiry regarding order status	31.00	16.00	11.00
Request about payment issues	29.00	14.00	7.00
Inquiry about product availability	29.00	16.00	13.00
Request about membership benefits	27.00	17.00	13.00
Complaint about membership benefits	27.00	12.00	9.00
Feedback for more information on a product	26.00	16.00	7.00
Complaint for more information on a product	25.00	16.00	8.00
Complaint about payment issues	25.00	13.00	8.00
Feedback about payment issues	23.00	16.00	8.00
Complaint about delayed delivery	23.00	13.00	10.00
Request regarding order status	22.00	13.00	10.00
Inquiry for more information on a product	22.00	12.00	7.00
Request about delayed delivery	21.00	13.00	10.00
Feedback regarding order status	21.00	9.00	4.00
Feedback about product availability	21.00	11.00	6.00
Feedback about membership benefits	21.00	12.00	8.00
Request for more information on a product	20.00	9.00	3.00
Inquiry about membership benefits	20.00	11.00	8.00
Complaint regarding order status	19.00	10.00	4.00
Request about product availability	17.00	11.00	8.00
Inquiry about payment issues	17.00	11.00	7.00
Inquiry about delayed delivery	16.00	10.00	6.00
Feedback about delayed delivery	16.00	9.00	6.00
Complaint about product availability	12.00	8.00	5.00

Upon analyzing the customer communication log, the most frequent queries are inquiries regarding order status, requests about payment issues, and inquiries about product availability. These logs indicate that there might be issues with properly communicating the delivery status of products to customers, leading to a high frequency of inquiries about order status. Additionally, payment issues on the platform and low product availability are also significant concerns for customers, as evidenced by the frequency of related queries.

Predictive Analysis for Future Spending:



Based on the Trend Lines Model analysis, it is evident that there is a statistically significant relationship between the month of the order date and the total amount spent by customers. The model indicates that as the month progresses, there is a slight decrease in the total spending. The R-squared value of 0.624439 suggests that approximately 62.44% of the variance in total spending can be explained by the month of the order date, indicating a moderate level of explanatory power.

This information can be valuable for understanding seasonal spending patterns and optimizing marketing strategies to capitalize on periods of higher spending and mitigate potential declines in other months.

Product and Membership Correlation:



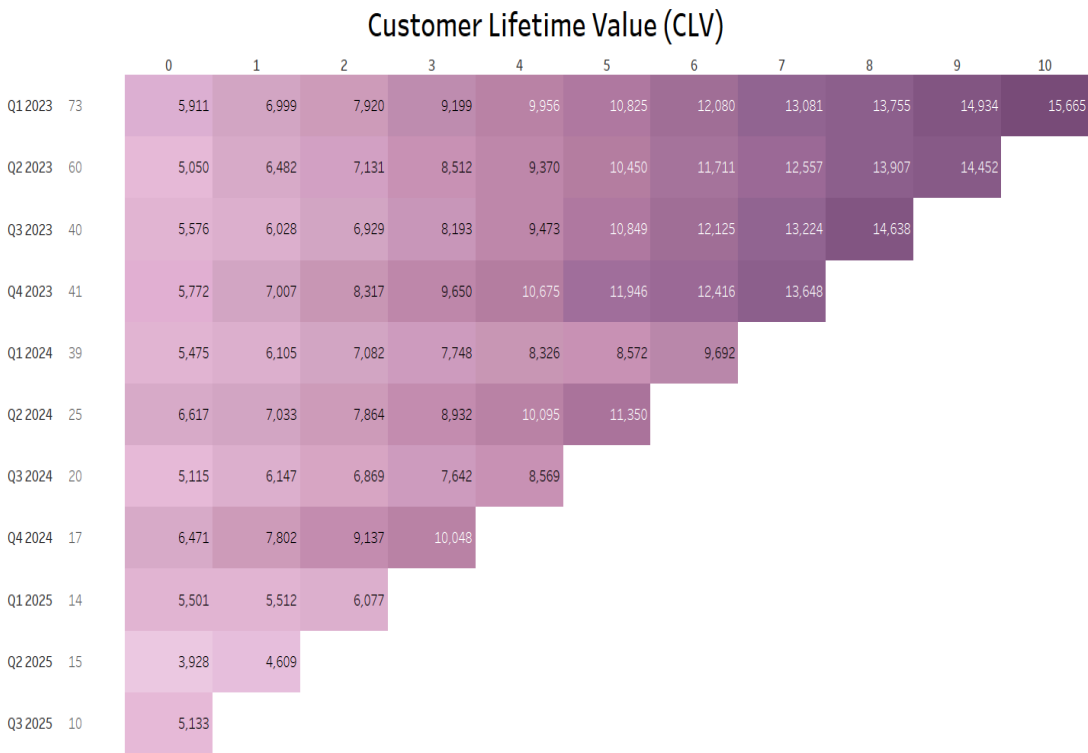
Upon analyzing the correlation between products and membership types, it is observed that customers belonging to the premium membership category tend to spend more on laptops, bikes, and toys. On the other hand, customers with VIP membership show a higher propensity to spend on toys, while those with standard membership are inclined towards purchasing laptops and bikes.

Clustering for Customer Segmentation:



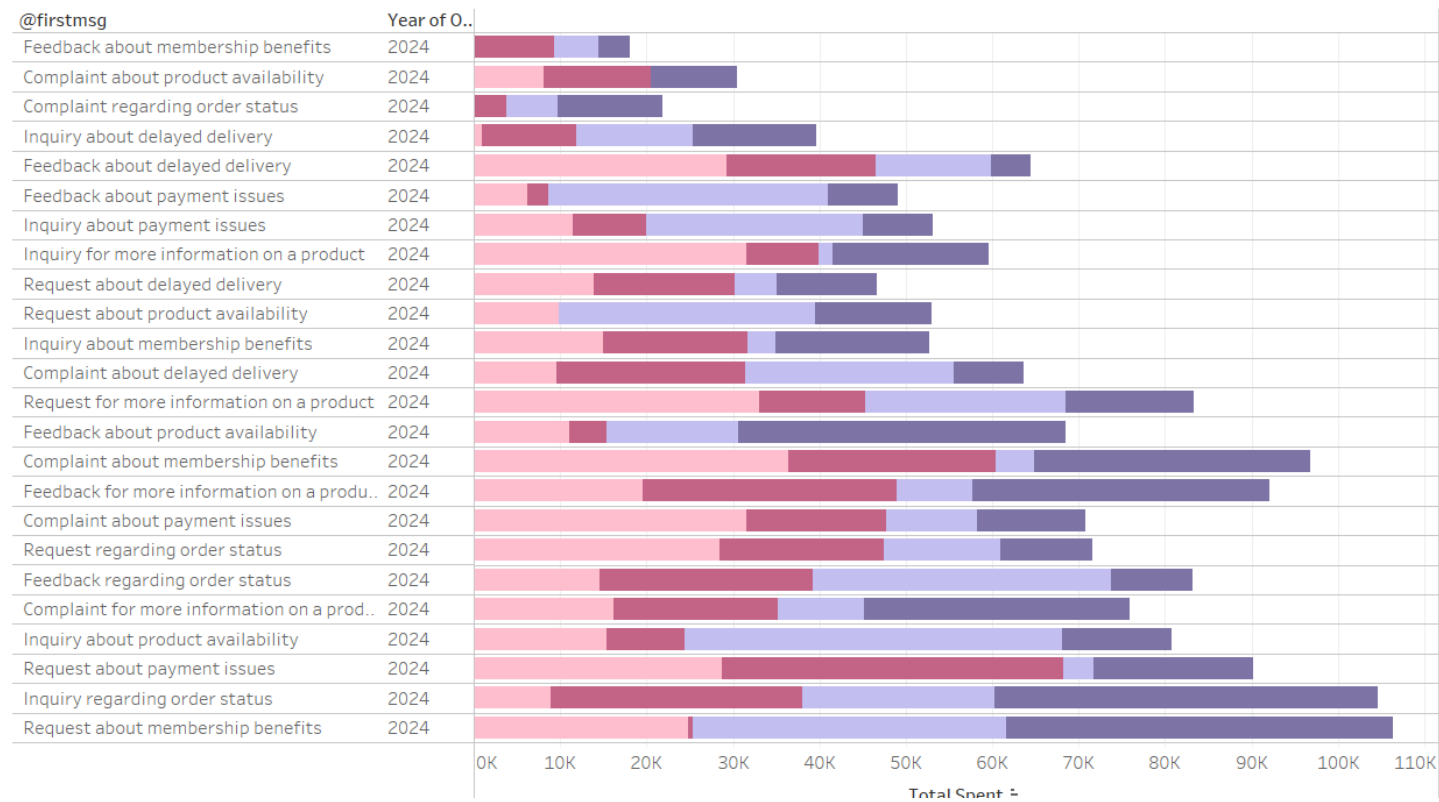
In customer segmentation based on membership, medium spenders stand out with the highest total spend, reaching approximately 552K \$, mainly from VIP membership, followed by the standard category. Conversely, high spenders, largely composed of premium membership, demonstrate significant expenditure of around 353K \$ on just 164 items. Interestingly, premium members also lead in the low spender category, spending approximately 40K \$ on 158 items. This trend underscores premium members' inclination towards higher-priced items, while low spenders tend to opt for lower-priced items.

Advanced Data Calculations for Customer Lifetime Value (CLV):



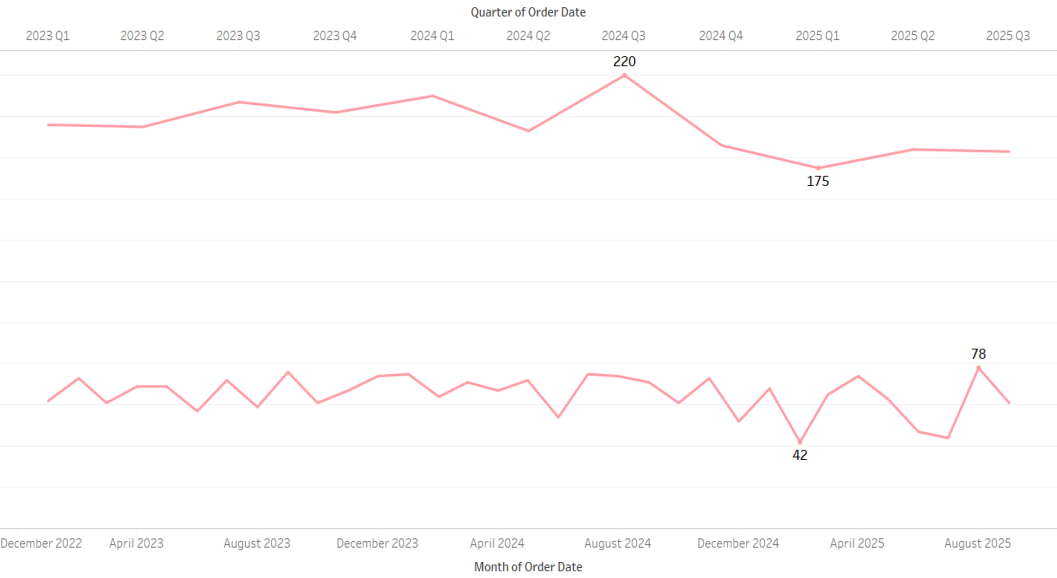
Upon examining the customer lifetime value matrix, it's evident that the values are on an upward trajectory over time, with certain quarters experiencing particularly rapid increases in value.

Customer Feedback Analysis:



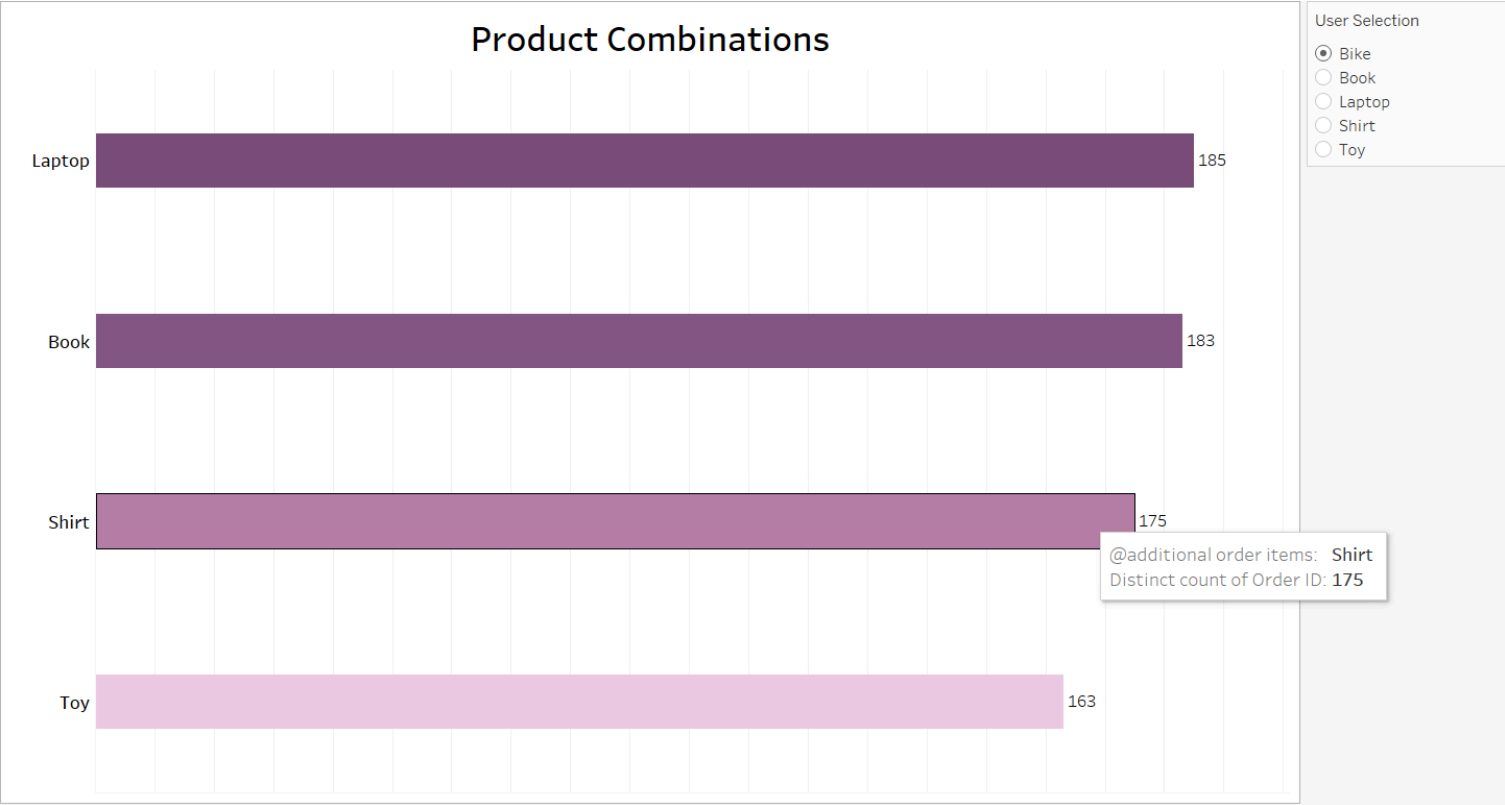
Upon examining customer feedback alongside total spending per quarter, it becomes apparent that customers who express concerns about product availability tend to spend less compared to others. Following closely are inquiries about delayed delivery, indicating that both unavailability of products and delayed deliveries contribute to decreased spending behavior among customers.

Custom Date Parsing for Order Trends:



Upon analyzing total orders by month and quarter, it is observed that the third quarter of 2024 had the highest number of orders, totaling around 220, whereas the first quarter of 2025 recorded the lowest number of orders. Furthermore, when examining monthly trends, August 2025 stood out with the highest number of orders, reaching around 78, while February of the same year marked the lowest order count.

Market Basket Analysis for Product Combinations:



Upon examining the market basket analysis, it's evident that customers who frequently purchase bikes also tend to purchase laptops most often. Additionally, customers buying laptops tend to accompany their purchase with books consistently.

Conclusion:

After analyzing various aspects of our data through different graphs and visualizations, several key conclusions can be drawn:

- Customer Segmentation by Spending
 - Medium spenders, particularly from VIP membership, contribute the highest total spend.
 - Premium members dominate the high spender category, indicating a propensity for purchasing higher-priced items.
 - Premium members also emerge as top spenders among low spender categories, suggesting diverse spending habits across membership tiers.
- Customer Lifetime Value (CLV)
 - CLV values are calculated, and it's observed that they are increasing over time, indicating positive customer retention and spending trends.
- Customer Feedback and Spending Patterns
 - Customers expressing concerns about product availability tend to spend less, highlighting the impact of inventory management on customer spending.
 - Similarly, inquiries about delayed delivery also correlate with reduced spending, indicating the importance of timely order fulfillment.
- Order Trends
 - The third quarter of 2024 shows the highest order volume, while the first quarter of 2025 exhibits the lowest orders.

- August 2025 has the highest monthly orders, whereas February 2025 has the lowest, suggesting seasonal fluctuations in purchasing behavior.

5. Market Basket Analysis

- Customers purchasing bikes often complement their purchase with laptops, indicating a potential cross-selling opportunity.
- Similarly, laptop buyers frequently purchase books alongside, showcasing consistent purchasing patterns and potential product bundling strategies.

These insights provide valuable information for strategic decision-making, including targeted marketing campaigns, inventory management, and product bundling strategies to enhance customer satisfaction and maximize revenue.