SQL and Databases: Project Report

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project report on New-Wheels

Problem Statement:

- New-Wheels sales have been dipping steadily in the past year, and due to the critical customer feedback and ratings online, there has been a drop in new customers every quarter, which is concerning to the business. The CEO of the company now wants a quarterly report with all the key metrics sent to him so he can assess the health of the business and make the necessary decisions.

Business Overview

Total Revenue	Total Orders	Total Customers	Avg Rating
125.4 M	1000	994	3.1

Last Qtr Revenue	Last Qtr Orders	Avg Days to Ship	% Good Feedback
23.4 M	199	97	21.5 %

Observations

1. We have got a total revenue of 125.48 million (125,482,804) from 100 orders throughout the year.

2. A total of 994 customers placed 1000 orders.

3. Total number of customers are 994.

4. Average rating we got as a result of customer feedback is 3.13 by 1000 orders.

5. Revenue for 4thquarter is 23.49M (23,496,008).

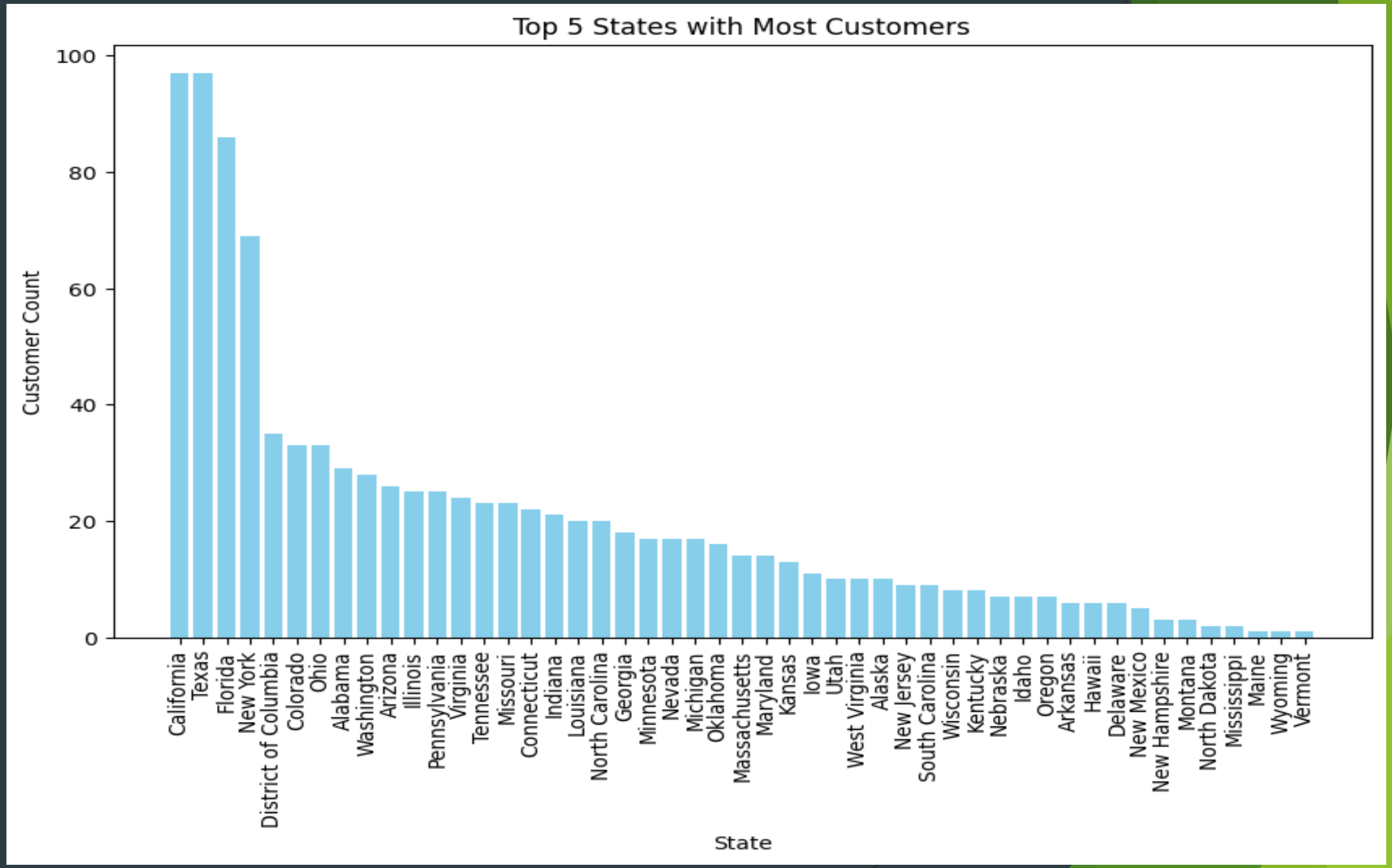
6. We received a total of 199 orders in last quarter.

7. It takes an average of 97 days to ship an order. 8. We get 21.5% Good feedback from customers.

Customer Matrics

Distribution of Customers across States

state	Coustomer-count
California	97
Texas	97
Florida	86
New York	69
District of Columbia	35


Top 5 States with Most Customers
Customer Count
100
80
60
40
20
0
California
Texas
Florida
New York
District of Columbia
Colorado
Ohio
Alabama
Washington
Arizona
Illinois
Pennsylvania
Virginia
Tennessee
Missouri
Connecticut
Indiana
Louisiana
North Carolina
Georgia
Minnesota
Nevada
Michigan
Oklahoma
Massachusetts
Maryland
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Kentucky
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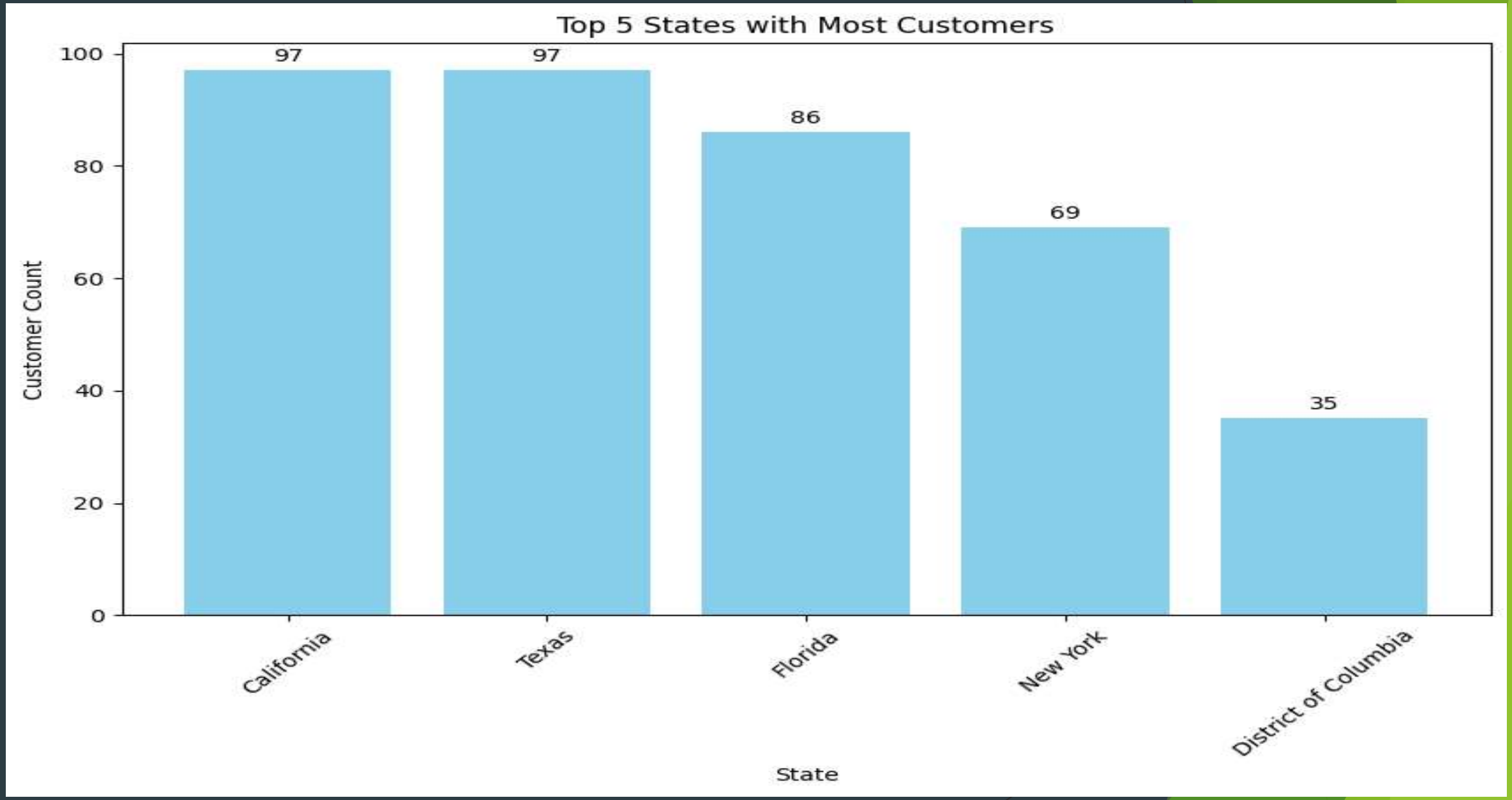
Hawaii
Delaware
New Mexico
New Hampshire
Montana
North Dakota
Mississippi
Maine
Wyoming
Vermont
State


Top 5 States with Most Customers
Customer Count
100
80
60
40
20
0
97
97
86
69
35
California
Texas
Florida
New York
District of Columbia
State

1.Observations

Distribution of Customer Counts:

The customer counts vary widely among the states. A large number of states have relatively low customer counts compared to the top states.

Statistical Summary:

Count: There are 49 states included in the data.

Mean: The average customer count per state is approximately 20.29.

Standard Deviation (Std): The standard deviation is about 22.43, indicating high variability in customer counts across states.

Minimum: The state with the fewest customers has only 1 customer.

25th Percentile (Q1): 25% of the states have 7 or fewer customers.

Median (50th Percentile): The median customer count is 14, meaning half of the states have fewer than 14 customers.

75th Percentile (Q3): 75% of the states have 24 or fewer customers.

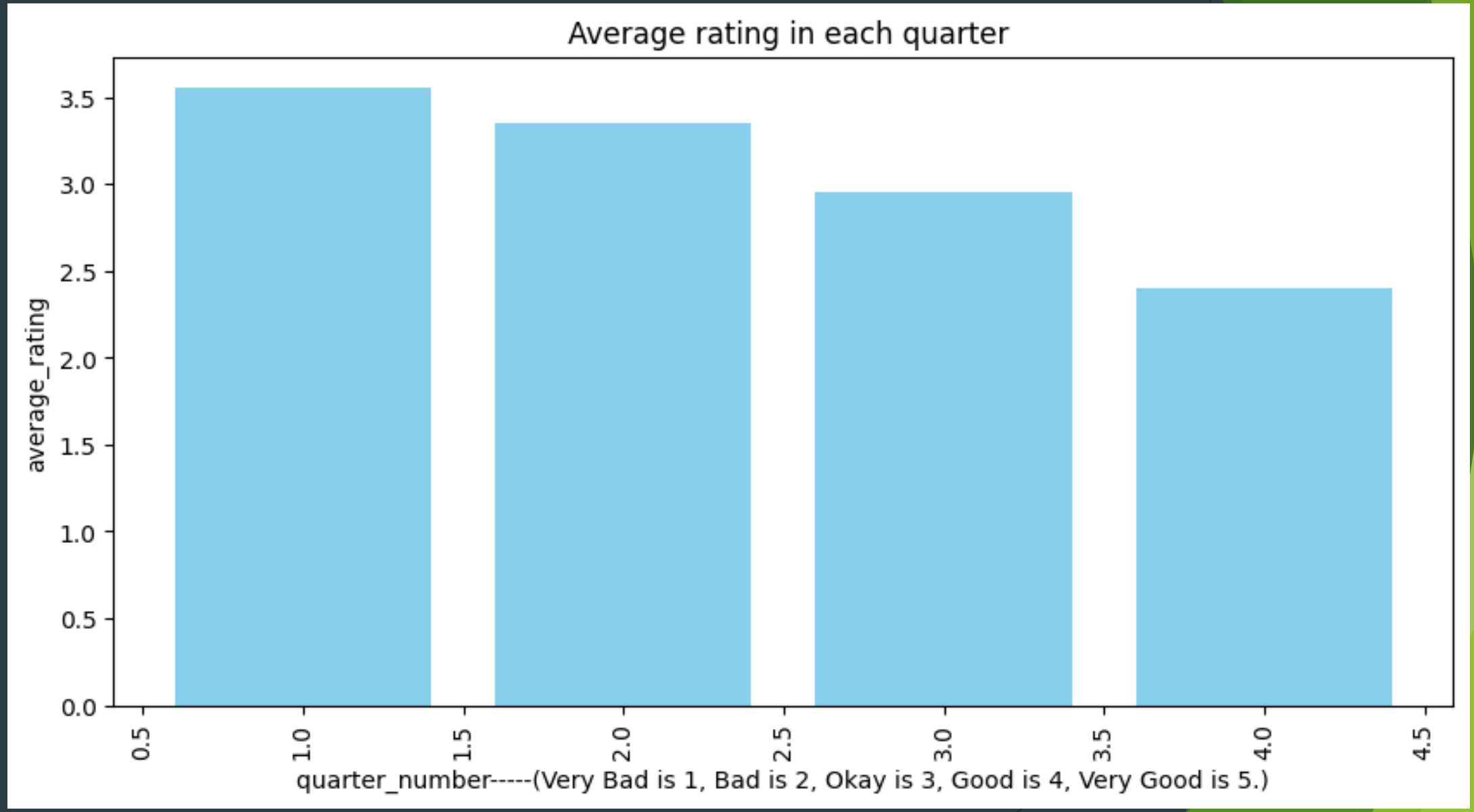
Maximum: The highest customer count for a state is 97.

Key Findings

1. **Concentration of Customers:**
    - A small number of states have a disproportionately high number of customers. California, Texas, and Florida together have significantly more customers than the majority of other states.
2. **High Variability:**
    - There is a high level of variability in customer distribution, as indicated by the high standard deviation. This suggests that customer counts are not evenly distributed across states.
3. **Skewness in Data:**
    - The data is right-skewed, with a few states having very high customer counts while many states have relatively low counts. This is evident from the fact that the mean is higher than the median.
4. **Potential Focus Areas:**
    - For businesses or services looking to expand, focusing on states with higher customer counts like California, Texas, and Florida might be beneficial due to the already established customer base.

Average Customer Ratings by Quarter

Quarter_number	Average_rating
1	3.5548
2	3.3550
3	2.9563
4	2.3970


Average rating in each quarter
average_rating
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
quarter_number-----(Very Bad is 1, Bad is 2, Okay is 3, Good is 4, Very Good is 5.)

Observations

Statistical Summary:

- **Count:** There are 4 quarters included in the data.
- **Mean:** The average rating across all quarters is approximately 3.07.
- **Standard Deviation (Std):** The standard deviation is about 0.51, indicating moderate variability in ratings across quarters.
- **Minimum:** The lowest average rating for a quarter is 2.40.
- **25th Percentile (Q1):** 25% of the quarters have an average rating of 2.82 or lower.
- **Median (50th Percentile):** The median average rating is approximately 3.16, meaning half of the quarters have an average rating lower than 3.16 and half have higher.
- **75th Percentile (Q3):** 75% of the quarters have an average rating of 3.40 or lower.
- **Maximum:** The highest average rating for a quarter is 3.55.

Key Findings

Quarterly Performance:

•The first quarter stands out with the highest average rating, indicating better performance or satisfaction during this period.

The average rating tends to decrease over the subsequent quarters, with the fourth quarter having the lowest rating. This could indicate a trend of declining performance or satisfaction throughout the year.

Moderate Variability:

•The moderate standard deviation suggests that while there is some variability in ratings across the quarters, it is not extremely high. The ratings are relatively consistent but show a clear downward trend.

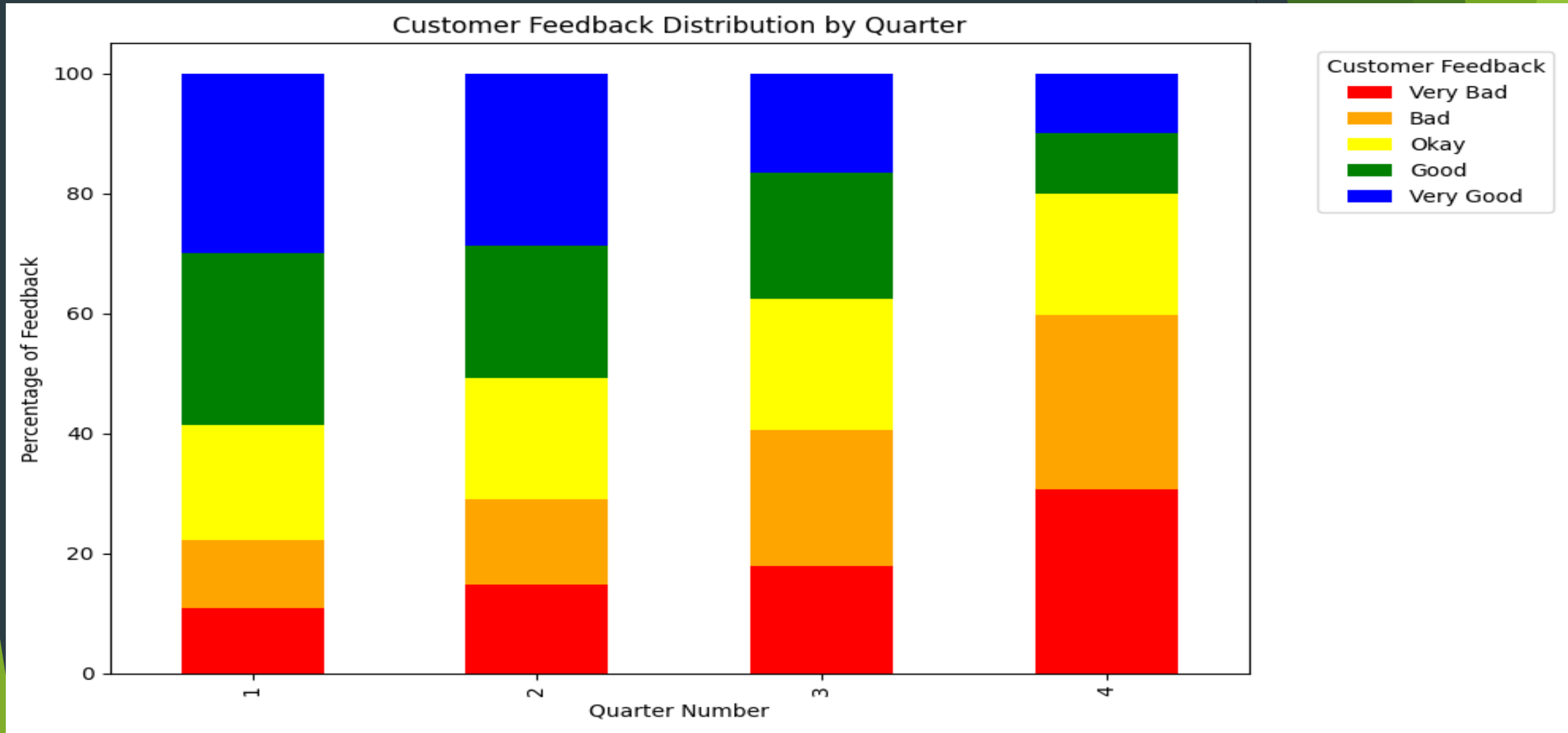
•Overall Satisfaction:

•The overall mean rating of 3.07 indicates an "Okay" to "Good" level of satisfaction, based on the rating scale provided (Very Bad is 1, Bad is 2, Okay is 3, Good is 4, Very Good is 5).

•Areas for Improvement:

•The decline in ratings from Q1 to Q4 suggests areas for improvement, particularly in maintaining or enhancing performance and satisfaction levels as the year progresses. Identifying the factors contributing to the higher ratings in Q1 and addressing the challenges in the latter quarters could be beneficial.

Trend of customer Satisfication



Observations / key findings

Distribution of Feedback:

- **Q1:** High percentage of "Very Good" (blue) and "Good" (green) feedback.
- **Q2:** Slight reduction in "Very Good" feedback, increase in "Bad" (orange) feedback.
- **Q3:** Noticeable decrease in "Very Good" feedback, with an increase in "Very Bad" (red) and "Bad" feedback.
- **Q4:** Highest percentage of "Very Bad" feedback and lowest "Very Good" feedback, indicating a decline in
- customer satisfaction.

Statistical Summary of Feedback

Percentages:
Mean Feedback Percentage: The average feedback percentage across all categories and quarters is 20%, indicating an even split if there were no significant shifts in satisfaction.

Standard Deviation (Std): A standard deviation of approximately 6.87 indicates moderate variability in feedback percentages across different categories and quarters.

Minimum and Maximum Feedback Percentages:
The minimum feedback percentage is 10.05% (likely representing the lowest category in a quarter).
The maximum feedback percentage is 30.65% (likely representing the highest category in a quarter).

trend of Customer Satisfaction:

•**Q1 to Q4:** There is a clear trend of decreasing positive feedback ("Good" and "Very Good") and increasing
•negative feedback ("Very Bad" and "Bad") as the quarters progress.

Quartiles:
25th Percentile (Q1): 14.69% of feedback falls below this percentage.
Median (50th Percentile): The median feedback percentage is 20.16%, suggesting that half of the

feedback percentages are below this value and half are above.
75th Percentile (Q3): 24.19% of feedback falls below this percentage.

Key Findings:

1.Decline in Positive Feedback: There is a noticeable decline in "Very Good" and "Good" feedback from Q1 to Q4, indicating decreasing customer satisfaction over time.

2.Increase in Negative Feedback: The increase in "Very Bad" and "Bad" feedback from Q1 to Q4 highlights growing dissatisfaction among customers.

3.Moderate Variability: The standard deviation indicates that while there is variability in feedback, it is not extremely high, suggesting some consistency in feedback patterns.

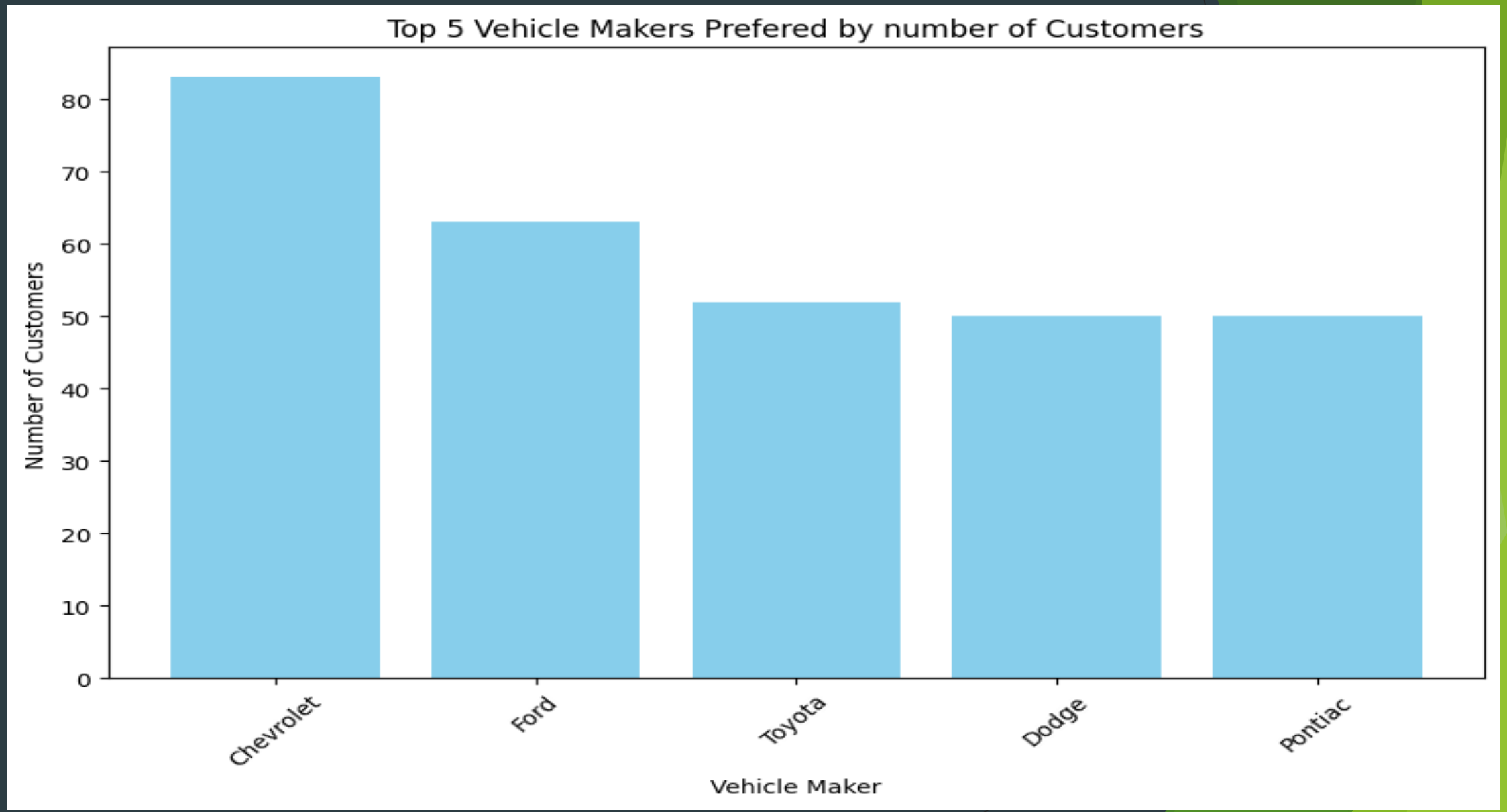
4.Balanced Feedback Distribution: The mean feedback percentage being 20% suggests a balanced distribution of feedback categories overall, but this balance is disrupted when looking at individual quarters.

Conclusion:

The analysis reveals a clear trend of declining customer satisfaction over the quarters, with increasing negative feedback and decreasing positive feedback.
This trend highlights the need for interventions to address customer concerns and improve satisfaction, particularly in the latter quarters of the year. Identifying the root causes of dissatisfaction and implementing targeted improvements could help reverse this trend and enhance overall customer satisfaction.

Top Vehicle makers preferred by customers

vehicle_maker	customer_count
Chevrolet	83
Ford	63
Toyota	52
Dodge	50
Pontiac	50


Top 5 Vehicle Makers Prefered by number of Customers
Number of Customers
0
10
20
30
40
50
60
70
80
Chevrolet
Ford
Toyota
Dodge
Pontiac
Vehicle Maker

Observation and Key Findings:

- **Chevrolet** appears to be the most popular among the listed vehicle makers, indicating a strong customer preference.

- **Ford** comes second, showing a significant but slightly lower customer base compared to Chevrolet.

- **Toyota**, while slightly behind Ford, still maintains a solid customer base, suggesting a competitive position in the market.

- **Dodge** and **Pontiac** share the fourth position with equal customer counts, indicating a similar level of customer interest for these brands.

These findings suggest that Chevrolet and Ford have a noticeable lead in customer numbers compared to Toyota, Dodge, and Pontiac, which are closely grouped together.

Most preferred vehicle make in each state

state	vehicle_maker	customer_count
Alabama	Dodge	5
Alaska	Chevrolet	2
Arizona	Cadillac	3
Arizona	Pontiac	3
Arkansas	Chevrolet	1
Arkansas	GMC	1
Arkansas	Mitsubishi	1
Arkansas	Pontiac	1
Arkansas	Suzuki	1
Arkansas	Volkswagen	1

state	vehicle_maker	customer_count
California	Audi	6
California	Chevrolet	6
California	Dodge	6
California	Ford	6
California	Nissan	6
Colorado	Chevrolet	5
Connecticut	Chevrolet	2
Connecticut	Maserati	2
Connecticut	Mercury	2
Connecticut	Volvo	2

state	vehicle_maker	customer_count
Delaware	Mitsubishi	2
District of Columbia	Chevrolet	4
Florida	Toyota	7
Georgia	Toyota	3
Hawaii	Cadillac	1
Hawaii	Ford	1
Hawaii	GMC	1
Hawaii	Nissan	1
Hawaii	Pontiac	1
Hawaii	Toyota	1

state	vehicle_maker	customer_count
Illinois	Chevrolet	3
Illinois	GMC	3
Illinois	Ford	3
Indiana	Mazda	4
Iowa	Chevrolet	1
Iowa	Chrysler	1
Iowa	Dodge	1
Iowa	Ford	1
Iowa	Hyundai	1
Iowa	Isuzu	1
Iowa	Jeep	1
Iowa	Mazda	1
Iowa	Pontiac	1
Iowa	Porsche	1
Iowa	Subaru	1

state	vehicle_maker	customer_count
Kansas	Buick	1
Kansas	Dodge	1
Kansas	Ford	1
Kansas	GMC	1
Kansas	Honda	1
Kansas	Lexus	1
Kansas	Maserati	1
Kansas	Mazda	1
Kansas	Mercedes-Benz	1
Kansas	Nissan	1
Kansas	Saab	1
Kansas	Suzuki	1
Kansas	Volkswagen	1
Kentucky	Acura	1
Kentucky	Audi	1
Kentucky	Mercedes-Benz	1
Kentucky	Mercury	1
Kentucky	Nissan	1
Kentucky	Pontiac	1
Kentucky	Ram	1
Kentucky	Volvo	1
Louisiana	Nissan	2
Louisiana	BMW	2
Louisiana	Ford	2
Louisiana	Pontiac	2
Louisiana	Kia	2

state	vehicle_maker	customer_count
Maine	Mercedes-Benz	1
Maryland	Ford	5
Massachusetts	Dodge	2
Massachusetts	Chevrolet	2
Michigan	Ford	3
Minnesota	GMC	3
Mississippi	Dodge	1
Mississippi	Toyota	1
Missouri	Chevrolet	4
Montana	Chevrolet	1
Montana	Dodge	1
Montana	Mitsubishi	1

state	vehicle_maker	customer_count
Nebraska	Cadillac	1
Nebraska	Chevrolet	1
Nebraska	Mercedes-Benz	1
Nebraska	Nissan	1
Nebraska	Pontiac	1
Nebraska	Toyota	1
Nebraska	Volkswagen	1
Nevada	Pontiac	3
New Hampshire	Chrysler	1
New Hampshire	Lexus	1
New Hampshire	Lincoln	1
New Jersey	Hyundai	2
New Jersey	Mercedes-Benz	2
New Mexico	Dodge	2
New York	Toyota	5
New York	Pontiac	5
North Carolina	Volvo	3
North Dakota	Ford	1
North Dakota	Hyundai	1
Ohio	Chevrolet	6
Oklahoma	Ferrari	2
Oklahoma	Mazda	2
Oklahoma	Toyota	2

state	vehicle_maker	customer_count
Oregon	Toyota	2
Pennsylvania	Toyota	3
South Carolina	Acura	1
South Carolina	BMW	1
South Carolina	Buick	1
South Carolina	Dodge	1
South Carolina	Isuzu	1
South Carolina	Jaguar	1
South Carolina	Kia	1
South Carolina	Mazda	1
South Carolina	Mitsubishi	1
Tennessee	Mazda	3
Texas	Chevrolet	9
Utah	Buick	1
Utah	Chevrolet	1
Utah	Dodge	1
Utah	Isuzu	1
Utah	Lincoln	1
Utah	Maybach	1
Utah	Oldsmobile	1
Utah	Pontiac	1
Utah	Subaru	1
Utah	Volkswagen	1

state	vehicle_maker	customer_count
Vermont	Mazda	1
Virginia	Ford	5
Washington	Chevrolet	5
West Virginia	Mercedes-Benz	2
Wisconsin	Acura	1
Wisconsin	Cadillac	1
Wisconsin	Chevrolet	1
Wisconsin	Dodge	1
Wisconsin	Honda	1
Wisconsin	Mazda	1
Wisconsin	Nissan	1
Wisconsin	Pontiac	1
Wyoming	Buick	1

Observations / key findings

- Here are some observations and key findings from the given data on vehicle makers and customer counts by state:

1. **Chevrolet Dominance:**
    1. Chevrolet is the most frequently mentioned vehicle maker, appearing in many states. The highest customer count for Chevrolet is in Texas with 9 customers, followed by Ohio and California with 6 customers each.
2. **State Preferences:**
    1. **California**: Has a diverse set of vehicle makers, with 6 customers each for Audi, Chevrolet, Dodge, Ford, and Nissan.
    2. **Texas**: Chevrolet is highly popular with 9 customers.
    3. **Florida**: Toyota leads with 7 customers.
    4. **New York**: Toyota and Pontiac each have 5 customers.

•Brand Preferences:

•**Toyota**: Popular in several states, with the highest count in Florida (7 customers).

•**Ford**: Also popular, especially in Maryland (5 customers) and Virginia (5 customers).

•**Dodge**: Significant presence in Alabama (5 customers) and scattered presence in other states.

•**Mazda**: Presence in multiple states but with lower customer counts, except for Indiana (4 customers).

•Luxury Brands:

•**Mercedes-Benz**: Present in several states with 2 customers in Connecticut, Nebraska, and West Virginia.

•**Maserati**: Found in Connecticut and Kansas with 2 and 1 customers, respectively.

•**Ferrari**: Found in Oklahoma with 2 customers.

•**Maybach**: Found in Utah with 1 customer.

•**Single Brand Dominance**:
•Some states show a single brand with a notable customer count, such as:
    •Alabama (Dodge - 5 customers)
    •Florida (Toyota - 7 customers)
    •Texas (Chevrolet - 9 customers)
    •Ohio (Chevrolet - 6 customers)

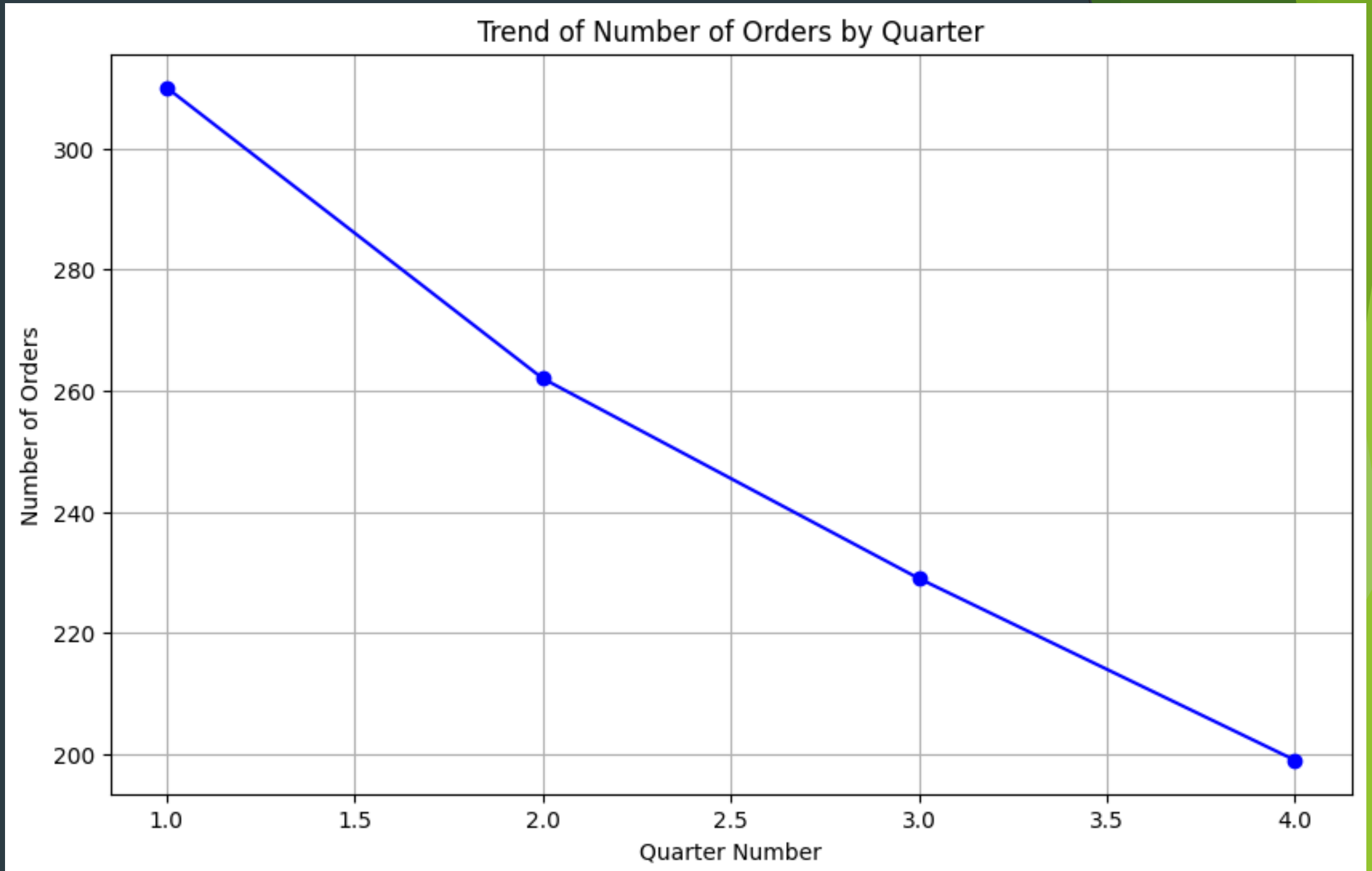
•**Varied Preferences**:
•States like Arkansas and Iowa show a wide variety of brands with low customer counts per brand,
• indicating no clear brand dominance.

•**Uncommon Brands**:
•Some less common brands such as Saab (Kansas), Porsche (Iowa), and Maybach (Utah) are present but with very few customers.

•**Geographic Trends**:
There appears to be some regional preferences. For example, Chevrolet is particularly strong in the Midwest and South, while Toyota is more popular in the Southeast and West Coast.

Revenue Metrics

Trend of purchases by Quarter


Trend of Number of Orders by Quarter
Number of Orders
300
280
260
240
220
200
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Quarter Number

Observations / key findings

•Quarter 1 (Q1):

•The number of orders is at its highest in Quarter 1, reaching approximately 310 orders.

•Quarter 2 (Q2):

•There is a noticeable decline in the number of orders in Quarter 2, falling to around 275 orders.

•Quarter 3 (Q3):

•The downward trend continues in Quarter 3, with the number of orders decreasing further to approximately 245 orders.

•Quarter 4 (Q4):

•The number of orders reaches its lowest point in Quarter 4, with about 199 orders.

Statistical Summary

- **Mean (Average) Order Count:** 250 orders
- **Standard Deviation:** 47.56 orders
- **Minimum Order Count:** 199 orders
- **25th Percentile:** 221.5 orders
- **Median (50th Percentile):** 245.5 orders
- **75th Percentile:** 274 orders
- **Maximum Order Count:** 310 orders

Key Findings:

1. **Decreasing Trend:**
    1. There is a clear downward trend in the number of orders from Q1 to Q4. The number of orders consistently decreases quarter over quarter.
2. **High Variability:**
    1. The standard deviation indicates significant variability in the number of orders across different quarters. This suggests that there might be external factors affecting order volumes differently in each quarter.
3. **Seasonal or Cyclical Influences:**
    1. The steady decline might indicate seasonal or cyclical influences that cause order volumes to drop over the course of the year.
4. **Business Strategy Implications:**

- The consistent decrease in order volume suggests that there may be a need to review business strategies, marketing efforts, or operational practices to address the decline and identify potential areas for improvement.

5. **Focus Areas for Improvement:**

Understanding the causes behind the sharp decline from Q1 to Q4 is essential. It may involve investigating customer behavior, market conditions, or internal business operations during these periods.

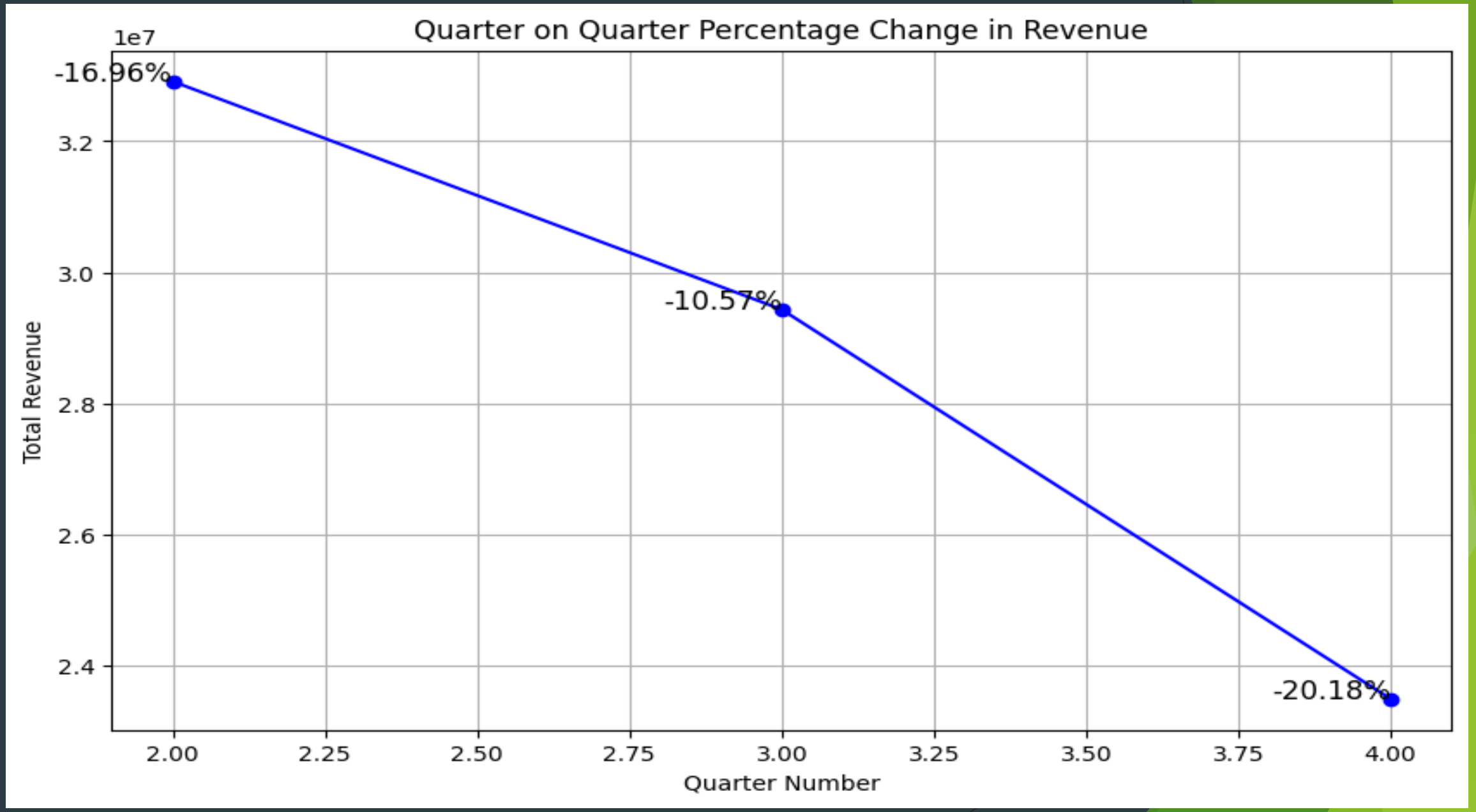
Conclusion:

The trend analysis reveals a concerning decrease in order volumes over the four quarters.

Identifying the underlying reasons for this trend and implementing targeted strategies to counteract

it will be crucial for improving future order volumes and overall business performance.

Quarter on Quarter % change in Revenue


Quarter on Quarter Percentage Change in Revenue
1e7
-16.96%
-10.57%
-20.18%
3.2
3.0
2.8
2.6
2.4
Total Revenue
2.00
2.25
2.50
2.75
3.00
3.25
3.50
3.75
4.00
Quarter Number

Observations / key findings

- **Overall Trend**:
- The revenue shows a continuous decline over the quarters. This is evident from the negative
- percentage changes in revenue from one quarter to the next.

- **Quarterly Percentage Change**:

- **From Q2 to Q3**: There was a decrease of 16.96%.

- **From Q3 to Q4**: The revenue declined by 10.57%.

- **From Q4 to Q5**: The revenue saw the steepest decline of 20.18%.

- **Revenue Values**:
- The total revenue decreased from approximately 3.3×1073.3 \times 10^73.3×107 in Q2 to about 2.4×1072.4 \times 10^72.4×107 in Q4.

Key Insights:

1.Consistent Decline:

- The company has experienced a consistent decrease in revenue over the observed quarters.
- This trend suggests that there may be underlying issues that need to be addressed to reverse this downward trajectory.

2.Significant Drop in Q4:

- The most significant drop occurs between Q3 and Q4, with a 20.18% decrease.
- This steep decline may warrant a closer investigation
- to identify specific factors contributing to this substantial drop.

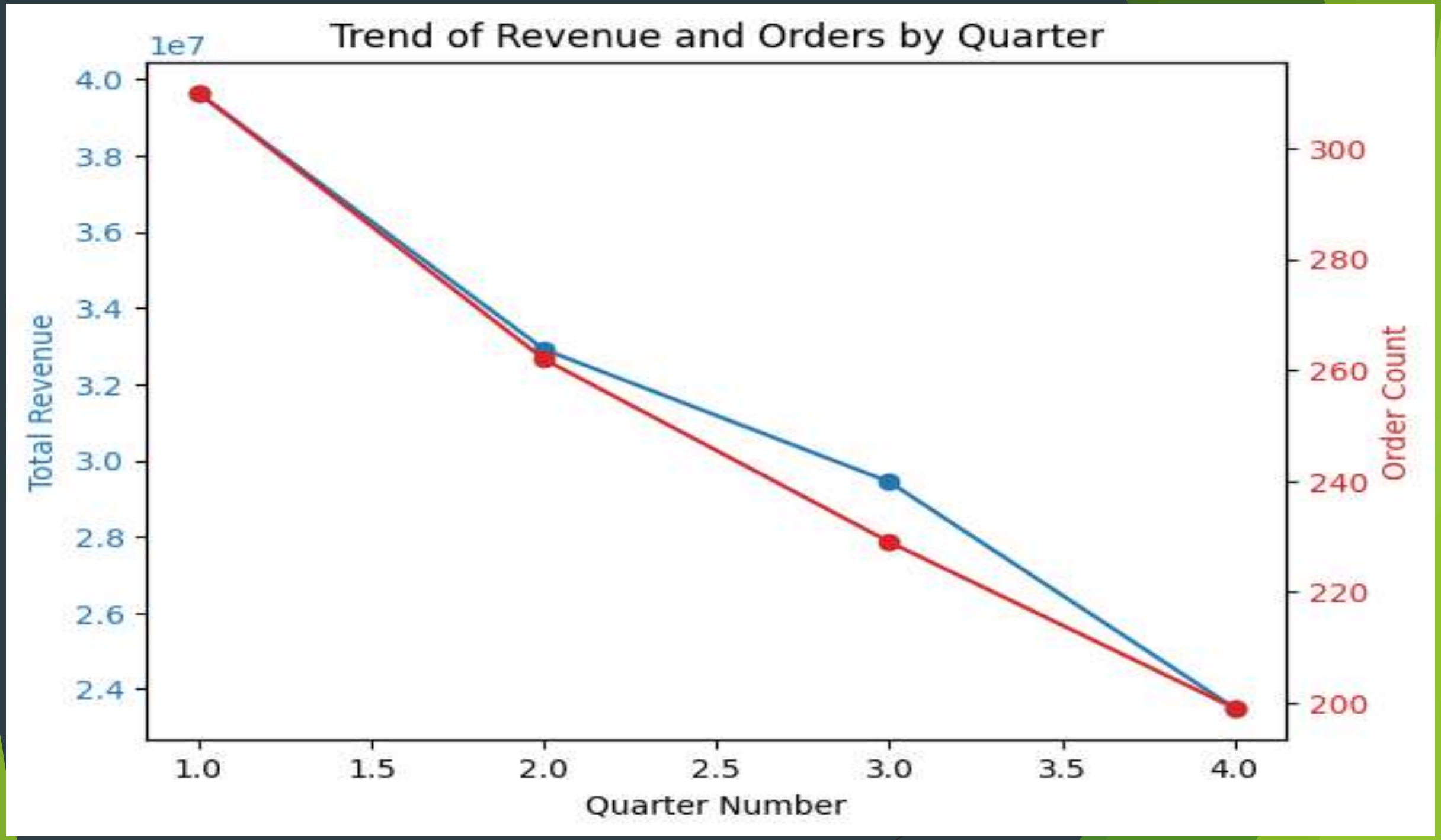
3.Strategic Adjustments:

- To improve revenue performance, the company may need to review its strategies,
- including marketing, product offerings, customer engagement, and operational efficiencies.
- Identifying and addressing the root causes of the revenue decline is crucial.

4.Forecasting and Planning:

- The trend highlights the need for better forecasting and planning to mitigate future revenue declines.
- Understanding market dynamics and customer behavior could help in making more informed decisions.

Trend of Revenue and Orders by Quarter


Trend of Revenue and Orders by Quarter
1e7
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
Total Revenue
300
280
260
240
220
200
Order Count
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Quarter Number

Observations / key findings

•Revenue and Order Trends:

•Both total revenue and order count show a declining trend across the quarters.

•The highest total revenue and order count were recorded in the first quarter, with approximately $39.64 million

• and 310 orders, respectively.

•The lowest values were observed in the fourth quarter, with around $23.50 million in revenue and 199 orders.

•Quarter-on-Quarter Decline:

•There is a consistent decline in revenue and order count from the first quarter to the fourth quarter.

•The revenue and order count follow a similar pattern, indicating that as the number of orders decreases,

• the total revenue also decreases proportionally.

•Correlation:

•The strong correlation between total revenue and order count suggests that the decline in the number of orders

•is a primary factor contributing to the reduction in revenue.

•Significance of Trends:

•The downward trend in both metrics could be a result of various factors such as seasonal variations,

•market conditions, changes in customer behavior, or company-specific issues.

•Identifying and addressing the causes of this decline could be crucial for improving future performance.

Recommendations:

1.Detailed Analysis:

1. Conduct a deeper analysis to understand the reasons behind the decline in orders and revenue.

This could involve looking into customer feedback, market trends, and internal factors.

2.Customer Retention Strategies:

1. Implement strategies to retain existing customers and attract new ones. This could include

loyalty programs, targeted marketing campaigns, and improving product or service quality.

3.Operational Improvements:

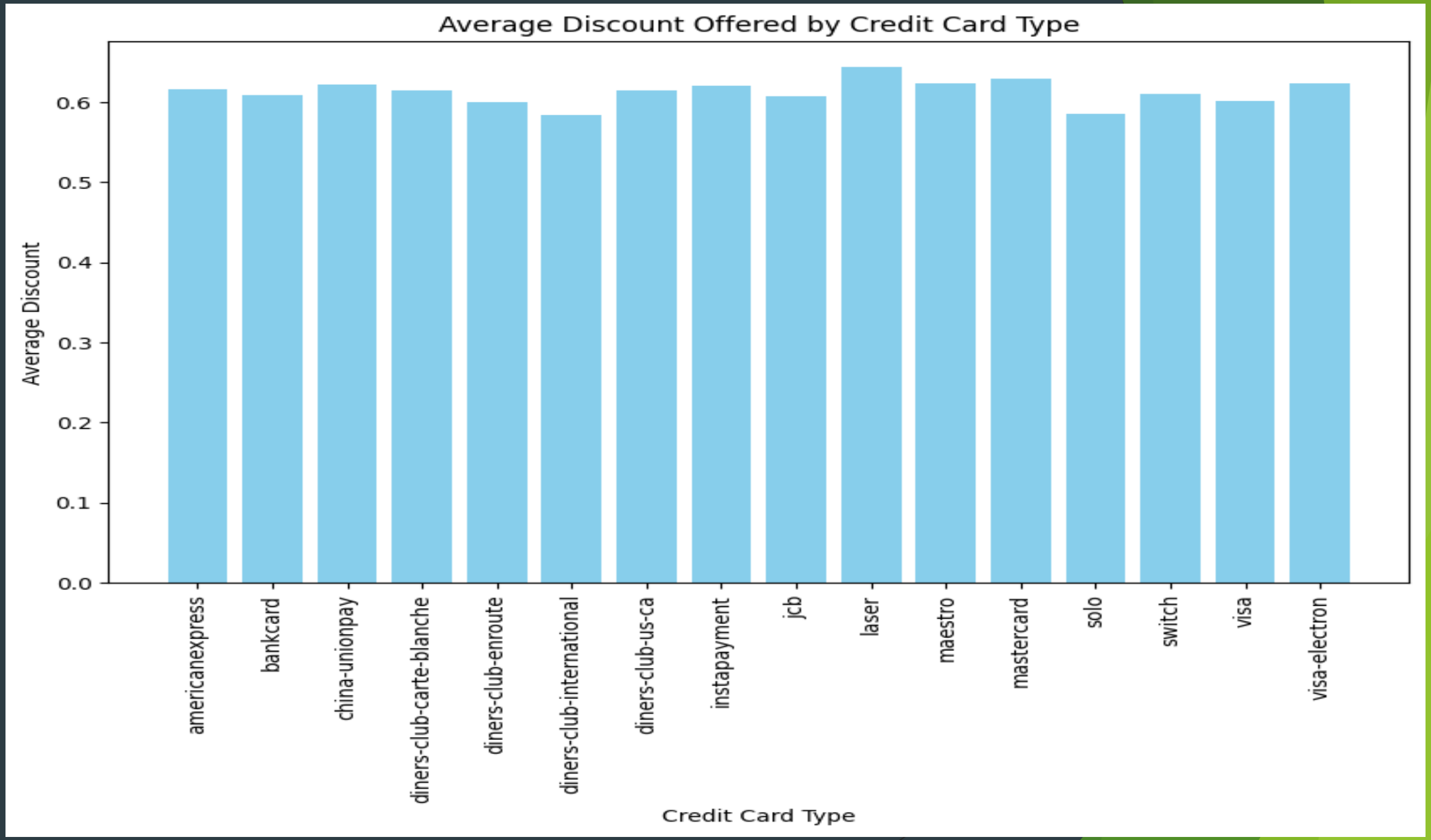
1. Evaluate and improve operational efficiencies to reduce costs and enhance customer satisfaction.

4.Market Research:

1. Conduct market research to identify new opportunities and adjust strategies to align with current market demands and trends.

Shipping Metrics

Average discount offered by Credit Card type


Average Discount Offered by Credit Card Type
Average Discount
0.0
0.1
0.2
0.3
0.4
0.5
0.6
americanexpress
bankcard
china-unionpay
diners-club-carte-blanche
diners-club-enroute
diners-club-international
diners-club-us-ca
instapayment
jcb
laser
maestro
mastercard
solo
switch
visa
visa-electron
Credit Card Type

Observations / key findings

- **Average Discount Range:**
- The average discount offered by different credit card types ranges from 0.584 to 0.643846.
- The highest average discount offered is approximately 0.643846, while the lowest is around 0.584.
- **Distribution:**
- The mean average discount is around 0.612878, with most credit card types offering discounts close to this value.
- The standard deviation is relatively low (0.015526), indicating that the average discounts
- are fairly consistent across different credit card types.
- **Significance:**
- The consistency in average discounts suggests that the company maintains
- a uniform discount policy across different credit card types.
- Identifying the credit card type with the highest discount could be useful for targeted
- marketing campaigns or promotional offers.

Recommendations:

Marketing Strategies:
Use the information about the average discount rates to tailor marketing strategies and promotions. Highlight the credit card types with the highest discounts in advertisements to attract more customers.

2.Customer Engagement:

3.Offer special promotions or additional discounts for credit card types with lower average discountsto encourage usage and increase customer satisfaction.

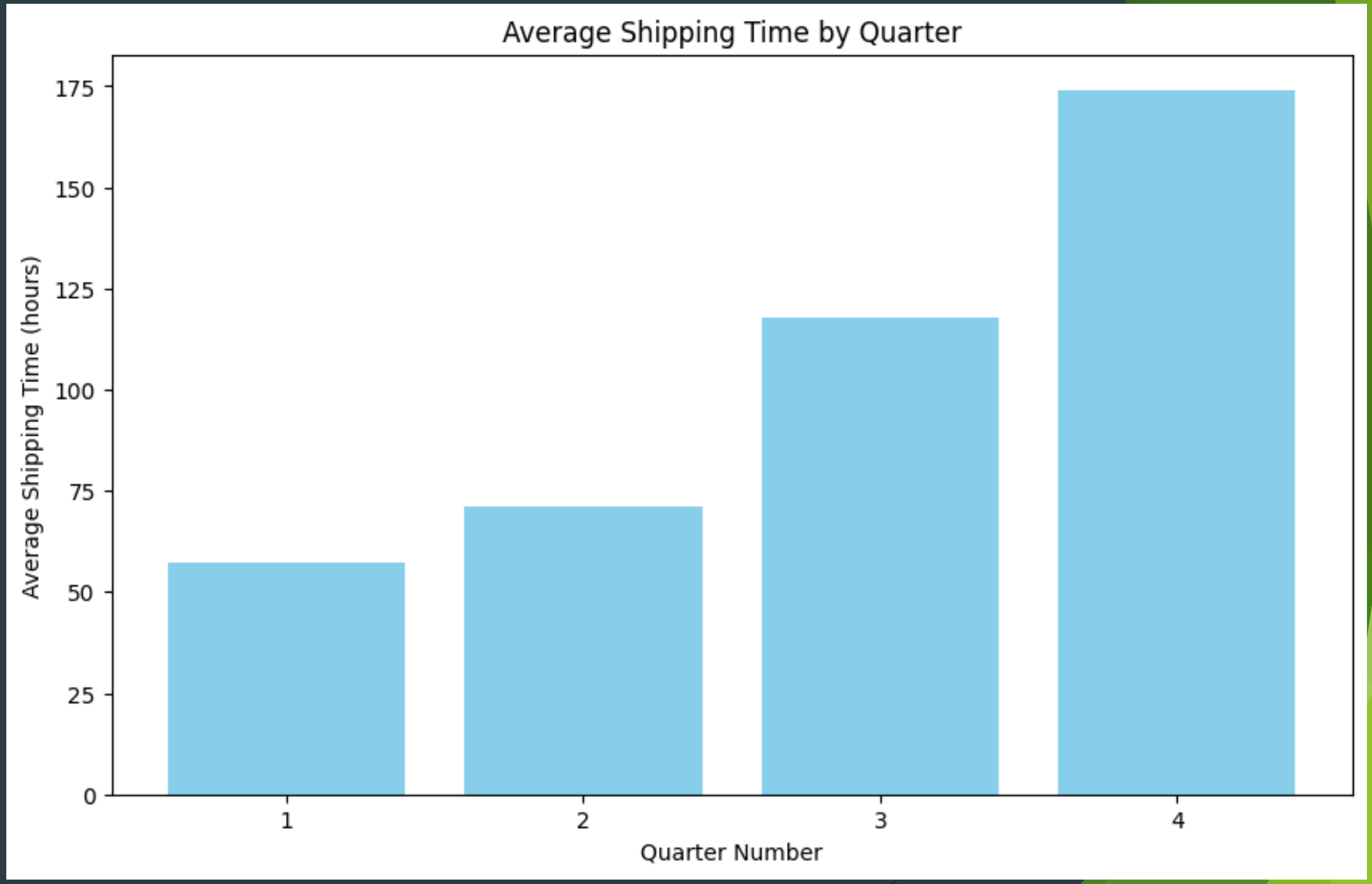
3.Continuous Monitoring:

4.Regularly monitor and analyze discount rates to ensure they align with market trendsand customer expectations. Adjust discount rates as needed to remain competitive.

By visualizing the data in a bar chart, we can easily compare the average discounts offered

by different credit card types and make informed decisions based on the insights gained.

Time taken to ship orders by Quarter


Average Shipping Time by Quarter
Average Shipping Time (hours)
0
25
50
75
100
125
150
175
1
2
3
4
Quarter Number

Observations / key findings

•Average Shipping Time Trends:

•The average shipping time shows a fluctuating trend across the quarters.

•The shipping time starts relatively low in the first quarter and increases significantly by the fourth quarter.

•**Quarterly Analysis:**

•**Q1:** The average shipping time is the lowest at approximately 57.17 hours.

•**Q2:** There is an increase in average shipping time to around 67.62 hours.

•**Q3:** The shipping time continues to rise, reaching approximately 94.43 hours.

•**Q4:** The average shipping time peaks at about 174.10 hours.

•Statistical Summary:

•The mean average shipping time across all quarters is about 105.03 hours.

•The standard deviation is 52.83 hours, indicating a significant variation in shipping times across different quarters.

•The range of shipping times spans from a minimum of 57.17 hours to a maximum of 174.10 hours.

•Implications:

•The increasing trend in shipping times may indicate operational inefficiencies or increased order volumes that are not

• being managed effectively.

•The substantial increase in Q4 suggests potential seasonal effects or capacity constraints during this period.

Recommendations:

1.Operational Efficiency:

- •Investigate the reasons behind the increasing shipping times and address any operational bottlenecks.
- •Consider implementing process improvements or increasing resources to handle higher order volumes more
- •efficiently.

2.Capacity Planning:

- •Enhance capacity planning, especially for the fourth quarter, to ensure timely order fulfillment during peak seasons.
- •Implement predictive analytics to forecast demand and optimize resource allocation.

3.Customer Communication:

- •Communicate with customers about expected shipping times, especially during periods when delays are
- • anticipated.
- •Offer expedited shipping options or discounts for delayed orders to maintain customer satisfaction.

By visualizing the data in a bar chart, we can easily identify trends in shipping times and make informed decisions
to improve operational efficiency and customer satisfaction.

Insights and Recommendations

- Insights from new_wheels in particular
  New_wheels made total revenue 125.48 millian from 1000 orders throughtout quarters.

  Total 994 customers placed 1000 order during year means its repeated orders customers ,shows customers loyalty and satisfication

  avg rating is 3.1 out of 5 by 1000 orders---indicates that avg rating between ‘okay’ and ‘Good’—there is improvement require.

Overall Insights

1.Customer Feedback Distribution:

1. There is a noticeable decline in positive feedback (Good and Very Good) over the quarters.

2. Negative feedback (Bad and Very Bad) increases significantly, especially in the later quarters.

2.Number of Orders:

1. There is a consistent decline in the number of orders from Quarter 1 to Quarter 4.

2. This downward trend suggests potential issues with customer satisfaction or market conditions.

3.Quarter on Quarter Revenue Changes:

1. Revenue also shows a declining trend across the quarters.

2. The percentage change in revenue is negative for each quarter, with the most significant drop in the fourth quarter.

4.Revenue and Orders Trend:

1. Both total revenue and order count exhibit a downward trend.

2. The correlation between revenue and orders suggests that as the number of orders decreases, the total revenue also declines.

1.Average Discount by Credit Card Type:

1. The average discounts offered are relatively consistent across different credit card types, with minor variations.

1. The mean discount is approximately 61.29%, indicating a high level of discounting which might be affecting profitability.

2.Average Shipping Time:

1. The average shipping time increases significantly from Quarter 1 to Quarter 4.

2. The fourth quarter shows a peak in shipping times, potentially indicating operational inefficiencies or increased demand.

Recommendations

1.Improve Customer Satisfaction:

- **Feedback Analysis:** Conduct a detailed analysis of customer feedback to understand the root causes of dissatisfaction.
- **Action Plan:** Develop an action plan to address common issues raised by customers, focusing on improving service quality and product offerings.

2.Boost Order Volumes:

- **Marketing Campaigns:** Implement targeted marketing campaigns to attract new customers and retain existing ones.
- **Promotions and Discounts:** Offer strategic promotions and discounts to incentivize purchases, while ensuring they do not erode profitability.

3.Revenue Optimization:

- **Pricing Strategy:** Review and optimize pricing strategies to balance competitiveness and profitability.
- **Product Mix:** Evaluate the product mix to ensure it aligns with customer preferences and market demand.

4.Enhance Operational Efficiency:

- **Shipping Processes:** Streamline shipping processes to reduce average shipping time, especially during peak seasons.
- **Capacity Planning:** Improve capacity planning to handle increased order volumes without compromising on delivery times.

5.Credit Card Discount Strategy:

- **Discount Review:** Review the discount strategy for credit card payments to ensure it attracts customers without significantly impacting margins.
- **Partnerships:** Explore partnerships with credit card companies for co-branded promotions that benefit both parties.

6.Data-Driven Decision Making:

- **Analytics Tools:** Implement advanced analytics tools to monitor key performance indicators (KPIs) and identify trends in real-time.
- **Continuous Improvement:** Establish a culture of continuous improvement, where data-driven insights are used to make informed decisions and drive business growth.

By addressing these areas, the company can improve customer satisfaction, increase order volumes, optimize revenue, and enhance operational efficiency. This holistic approach will help in reversing the negative trends observed and set the company on a path to sustainable growth.