New Wheels Project

Introduction to SQL

Problem Statement

Business Context

A lot of people in the world share a common desire: to own a vehicle. A car or an automobile is seen as an object that gives the freedom of mobility. Many now prefer pre-owned vehicles because they come at an affordable cost, but at the same time, they are also concerned about whether the after-sales service provided by the resale vendors is as good as the care you may get from the actual manufacturers.

New-Wheels, a vehicle resale company, has launched an app with an end-to-end service from listing the vehicle on the platform to shipping it to the customer's location. This app also captures the overall after-sales feedback given by the customer.

Objective

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.

As a data analyst, you see that there is an array of questions that are being asked at the leadership level that need to be answered using data. Import the dump file that contains various tables that are present in the database. Use the data to answer the questions posed and create a quarterly business report for the CEO.

Business Questions

Question 1: Find the total number of customers who have placed orders. What is the distribution of the customers across states?

Solution Query:

<SELECT c.STATE, COUNT(DISTINCT o.CUSTOMER_ID) AS total_customers

FROM customer_t c

JOIN order_t o ON c.CUSTOMER_ID = o.CUSTOMER_ID

GROUP BY c.STATE;

>

Output:

```
SELECT c.STATE, COUNT(DISTINCT o.CUSTOMER_ID) AS total_customers
FROM customer_t c
JOIN order_t o ON c.CUSTOMER_ID = o.CUSTOMER_ID
GROUP BY c.STATE;
```

TEST SQL RUN SQL

Query 1 (Passed): SELECT c.STATE, COUNT(DISTINCT o.CUSTOMER_ID) AS total_customers FROM customer_t c JOIN order_t o ON c.CUSTOMER_ID = o.CUSTOMER_ID GROUP BY c.STATE
Output:
Showing first 10 rows out of 37 rows

state	total_customers
Alabama	3
Arizona	1
Arkansas	2
California	17
Colorado	3
Connecticut	3
District of Columbia	5
Florida	9
Georgia	3
Idaho	1

Observations and Insights:

1. **State-wise customer distribution overview:**

- The table shows the number of distinct customers who have placed orders across various U.S states. Out of 37 rows (states), the data highlights states with both high and low customer engagement.
- California with 17 unique customers, leads significantly followed by Florida with 9 and District of Columbia with 5. On the other hand, states like Arizona and Idaho have minimal customer presence with only 1 customer each.

2. Top performing states:

- <u>California (17 customers):</u>
  This is by far the most important market for the company. With nearly twice the customer count of the second highest state (Florida), California presents a huge opportunity for expanding sales. A deeper analysis of customer behavior in California could reveal factors contributing to this success – such as customer demographics, presence and loyalty patterns. The company could leverage this insight by launching specific promotions, reward programs or loyalty incentives to retain and attract more customers in this region.
- <u>Florida (9 customers):</u>
  Florida stands out the second most important market, making it a strong potential focus area for growth. It would be wise to invest in customer satisfaction efforts here such as improved after-sales support and targeted advertising to build on the existing base.
- <u>District of Columbia (5 customers):</u>
  Although smaller in size, the District of Columbia shows a notable number of customers. The company could potentially increase this engagement further by studying the purchasing trends and investing in more tailored, region-specific marketing campaigns.
- <u>Moderately engaged states:</u>
  Alabama (3 customers), Georgia (3 customers) and Colorado (3 customers) shows a similar level of engagement. These states could provide growth opportunities if addressed with specific marketing strategies such as regional promotions, discounts or special offers on popular products. Their relatively low customer base suggests room for expansion.
- <u>Connecticut (3 customers):</u>
  A state with moderate engagement, similar tactics as mentioned for other states with 3 customers could help boost customer numbers here.
- <u>Low-engagement states:</u>
  Arizona (1 customer). Idaho (1 customer) and Arkansas (2 customers) are examples of states with very low customer numbers. The minimal representation in these states may point to either untapped potential or lack of awareness about the company's offerings. There is a possibility that regional factors like competition, pricing and customer preferences might differ significantly in these states. To increase market penetration here, the company could launch campaigns focusing on brand awareness, introducing services tailored to the needs of the local population or emphasizing the quality and value of their resale vehicles.

By focusing on high engagement regions while exploring strategies to tap into low-engagement areas, the company can optimize its efforts to drive sales, increase customer satisfaction and improve the overall business performance. California in particular stands out as a critical market that demands focused attention while other states may require more aggressive marketing and outreach to unlock their full potential.

Question 2: Which are the top 5 vehicle makers preferred by the customers?

Solution Query:

```
<SELECT VEHICLE_MAKER, COUNT(DISTINCT CUSTOMER_ID) AS customer_count

FROM product_t p

JOIN order_t o ON p.PRODUCT_ID = o.PRODUCT_ID

GROUP BY VEHICLE_MAKER

ORDER BY customer_count DESC

LIMIT 5;

>
```

Output:

```sql
SELECT VEHICLE_MAKER, COUNT(DISTINCT CUSTOMER_ID) AS customer_count
FROM product_t p
JOIN order_t o ON p.PRODUCT_ID = o.PRODUCT_ID
GROUP BY VEHICLE_MAKER
ORDER BY customer_count DESC
LIMIT 5;
```

TEST SQL RUN SQL

Execute ▷

SQL queries passed

Query 1 (Passed): SELECT VEHICLE_MAKER, COUNT(DISTINCT CUSTOMER_ID) AS customer_count FROM product_t p JOIN order_t o ON p.PRODUCT_ID = o.PRODUCT_ID GROUP BY VEHICLE_MAKER ORDER BY customer_count DESC LIMIT 5
Output:
Showing 5 rows

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

Observations and Insights:

1. Chevrolet leads in popularity:

- Chevrolet is the most preferred vehicle maker, with 83 customers choosing it significantly ahead of other brands. This suggests that Chevrolet models align with customer preferences, whether its in term of pricing, reliability or brand loyalty. Chevrolet's dominant position indicates its strong reputation in the pre-owned vehicle market and it might be beneficial for the company to increase inventory of the Chevrolet vehicles or offer exclusive promotions on them to capitalize on its popularity.

Recommendations:

- Given the large customer base, Chevrolet vehicles should be highlighted in marketing campaigns and customer satisfaction with these models should be continually monitored to ensure ongoing positive feedback.

2. Ford- A close competitor:

- Ford comes in second with 63 customers preferring the brand. While it trails Chevrolet the gap is not too wide. Ford's strong presence in the market may be attributed to the brand's reliability and appeal across different customer segments, particularly in the resale market. Ford's slightly lower customer count compared to Chevrolet could indicate either stiffer competition or fewer available models in the inventory.

Recommendations:

- The company can further explore what models or features of Ford vehicles are drawing customers and consider stocking more of those models. Promotional campaigns targeting Ford enthusiasts could help bridge the gap between Ford and Chevrolet, possibly driving further sales.

3. Toyota's strong performance:

- Toyota secures the 3rd position with 52 customers. Toyota's reputation for durability and longevity especially in the resale market, likely contributes to this strong performance. Pre-owned Toyota vehicles are often sought after for their lower cost of ownership and reliability making them a popular choice for budget conscious buyers.

Recommendations:

- With Toyota's well known value proposition focusing on marketing this brand to customers looking for dependable and long lasting vehicles could increase its marketing share. Additionally, offering warranties on pre-owned Toyota's could further incentivizes purchases.

4. Pontiac and Dodge-tied:

- Both Pontiac and Dodge have 50 customers each ranking fourth and fifth respectively. While these brands are not as dominant as Chevrolet and Ford, they still have a considerable following. Pontiac despite being a discontinued brand remains popular in the used car market due to its unique styling and performance oriented models.
- Dodge known for its muscle cars and family oriented SUV's, attracts a diverse range of customers. Both brands likely appeal to niche customer groups, with Dodge continued production and Pontiac's nostalgic value keeping them relevant in the used car segment.

- For Pontiac focusing on niche marketing to car enthusiasts who are interested in collectible or performance cars could drive additional sales. Dodge offers a broader appeal so stocking models like Dodge charger or Dodge Grand Caravan might cater to family buyers or performance seekers. Highlighting deals or incentives for these models could help maintain or grow their customer base.

5. Observations on vehicle preferences:

- The data indicates a strong preference for American brands. Chevrolet, Ford, Pontiac and Dodge all hail from U.S auto makers showing that domestic brands have a strong foothold in this particular customer base. This could be due to factors such as loyalty to American brands, better resale values or preference for vehicles that are perceived as more affordable to maintain.
- Toyota as the only non American brand in the top 5 still holds its own likely due to its global reputation for reliability and fuel efficiency.

6. Strategic insights for the business:

- Stock allocation:
  The data suggests that increasing the inventory of Chevrolet, Ford, and Toyota vehicles could meet the current demand and potentially increase sales. The company should evaluate its stock levels regularly to ensure that popular models from these brands are always available.
- Brand specific promotions:
  Running targeted promotions or loyalty programs for these top brands could further engage the customer base. For example, discounts on special financing options on Chevrolet and Ford vehicles could push potential buyers who are already leaning towards these brands to make a purchase.
- Market segmentation:
  Customers interested in Pontiac and Dodge likely belong to the niche groups – those seeking performance or family oriented vehicles. Segmenting the customer base and running personalized marketing campaigns (such as performance vehicle enthusiasts or family vehicle buyers) could help capitalize on these preferences.

Conclusion:

Chevrolet's dominance followed by Ford and Toyota suggests a clear preference for reliable and established vehicle brands. Pontiac and Dodge despite being lower in the rankings still hold notable appeal for specific segments of buyers. For the business, it would be wise to focus on maintaining and expanding the stock of these brands, implementing targeted marketing efforts and exploring ways to enhance the purchasing experience particularly for Chevrolet and Ford customers. By aligning inventory and promotions with these insights, the company can drive further growth and improve customer satisfaction.

Question 3: Which is the most preferred vehicle maker in each state?

Solution Query:

< SELECT c.STATE, p.VEHICLE_MAKER, o.CUSTOMER_ID

FROM product_t p

JOIN order_t o ON p.PRODUCT_ID = o.PRODUCT_ID

JOIN customer_t c ON o.CUSTOMER_ID = c.CUSTOMER_ID

LIMIT 10;

>

Output:

```
SELECT c.STATE, p.VEHICLE_MAKER, o.CUSTOMER_ID
FROM product_t p
JOIN order_t o ON p.PRODUCT_ID = o.PRODUCT_ID
JOIN customer_t c ON o.CUSTOMER_ID = c.CUSTOMER_ID
LIMIT 10;
```

TEST SQL RUN SQL

Query 1 (Passed): SELECT c.STATE, p.VEHICLE_MAKER, o.CUSTOMER_ID FROM product_t p JOIN order_t o ON p.PRODUCT_ID = o.PRODUCT_ID JOIN customer_t c ON o.CUSTOMER_ID = c.CUSTOMER_ID LIMIT 10
Output:
Showing first 10 rows out of 10 rows

state	vehicle_maker	customer_id
Ohio	Mazda	0409-7139
Illinois	Chevrolet	0023-4385
Indiana	Mazda	0378-5504
District of Columbia	Volvo	0363-0604
California	Buick	0615-7662
Illinois	Oldsmobile	0085-1132
Georgia	Ford	0093-5142
Texas	Lotus	0179-0080
California	Chevrolet	0378-3005
Iowa	Isuzu	0025-1851

Observations and Insights:

Observations:

1. **Vehicle makers with broader appeal:**

- Mazda: Appears in both Ohio and Indiana showing that it has some consistent appeal in the Midwest.

- Chevrolet: Present in both Illinois and California indicating Chevrolet has a broad customer base across different regions in U.S from Midwest to West coast.

2. Diversity in vehicle makers across regions:

- The data shows a wide range of vehicle makers from luxury brands like Lotus (in Texas) to more mainstream brands like Ford (in Georgia) and Chevrolet (in multiple states).
- The presence of niche brands like Lotus suggests that customers in Texas might have a preference for more specialized or high performance vehicles while customers in other states might prefer more utilitarian or practical vehicles.

3. Vehicles preference by state:

- Illinois has two distinct vehicle makers represented: Chevrolet and Oldsmobile. This shows a mix of both current and older, possibly classic vehicle preferences in the state.
- California also has a split between Buick and Chevrolet indicating that different segments of population might have varying preferences for vehicle types in this large diverse state.
- District of Columbia shows a preference for Volvo, a brand knows for safety which may reflect urban driving preferences or need for reliable vehicle in a congested area.

4. Geographical distribution of customers:

- Customers are spread across a wide range of U.S states showing that New-Wheels operates nationally.
- California and Illinois each have multiple customers in the sample which suggests that these states have higher sales volumes for New-Wheels compared to other states.
- Georgia, Texas and Iowa each shows one customer suggesting either lower market penetration or a smaller representation.

5. Mix of mainstream and niche brands:

- Ford, Chevrolet and Mazda are mainstream, well known brands which suggests that New-Wheels likely caters to the general population's demand for reliable, mass market vehicles.
- Brands like Lotus (high performance) and Oldsmobile (classic or used cars) show that New-Wheels also caters to niche markets for enthusiasts or collectors.

Insights:

1. Chevrolet's national appeal:

- Chevrolet appears in both Midwest and West coast. This indicates that Chevrolet is a brand with broad appeal across various regions in U.S, making it a key brand for New-Wheels to focus on its inventory and marketing efforts.

2. Mazda's regional consistency:

- Mazda is a vehicle maker of choice for customers in both Ohio and Indiana showing strong presence in the Midwest. Mazda is known for its reliability and fuel efficiency which may resonate with customers in this region who value practical, economical vehicles.

3. Luxury and niche market potential:

- The presence of Lotus and Texas points to a possible niche market for high performance or luxury vehicles in this region. If there is sufficient demand for luxury vehicles in Texas, New-Wheels could consider increasing its inventory of high-end brands and offering premium services such as specialized financing or exclusive promotions for luxury buyers.

4. Urban preferences in District of Columbia:

- The choice of Volvo in District of Columbia is a brand known for safety and reliability might reflect urban customer preferences. This insight could help New-Wheels market Volvo or similar brands in other urban centers where safety and reliability are highly valued.

5. Nostalgic appeal of Oldsmobile:

- The presence of Oldsmobile in Illinois suggests a potential market for classic or used vehicles, especially since Oldsmobile ceased production in 2004. If New-Wheels caters to classic car enthusiasts or customers looking for specific older models, this could be a niche worth exploring further.

6. Vehicle popularity by region:

- Ford in Georgia, Isuzu in Iowa and Lotus in Texas suggests that local preferences for vehicle types are varied, influenced by factors like geography, lifestyle or regional culture. Understanding these preferences can help New-Wheels optimize its inventory to meet regional demands better.

Question 4: Find the overall average rating given by the customers. What is the average rating in each quarter?

Consider the following mapping for ratings: “Very Bad”: 1, “Bad”: 2, “Okay”: 3, “Good”: 4, “Very Good”: 5

Solution Query:

```
<SELECT QUARTER_NUMBER,

    AVG(CASE

      WHEN CUSTOMER_FEEDBACK = 'Very Bad' THEN 1

      WHEN CUSTOMER_FEEDBACK = 'Bad' THEN 2

      WHEN CUSTOMER_FEEDBACK = 'Okay' THEN 3

      WHEN CUSTOMER_FEEDBACK = 'Good' THEN 4

      WHEN CUSTOMER_FEEDBACK = 'Very Good' THEN 5

      END) AS avg_rating

FROM order_t

GROUP BY QUARTER_NUMBER;

>
```

Output:

```sql
SELECT QUARTER_NUMBER,
       AVG(CASE
           WHEN CUSTOMER_FEEDBACK = 'Very Bad' THEN 1
           WHEN CUSTOMER_FEEDBACK = 'Bad' THEN 2
           WHEN CUSTOMER_FEEDBACK = 'Okay' THEN 3
           WHEN CUSTOMER_FEEDBACK = 'Good' THEN 4
           WHEN CUSTOMER_FEEDBACK = 'Very Good' THEN 5
           END) AS avg_rating
FROM order_t
GROUP BY QUARTER_NUMBER;
```

TEST SQL RUN SQL

CUSTOMER_FEEDBACK = 'Good' THEN 4 WHEN CUSTOMER_FEEDBACK = 'Very Good' THEN 5 END) AS avg_rating FROM order_t GROUP BY QUARTER_NUMBER
Output:
Showing 4 rows

quarter_number	avg_rating
1	3.554838709677419
2	3.354961832061069
3	2.9563318777292578
4	2.3969849246231156

Observations and Insights:

Observations:

1. **Steady decline in average customer ratings:**

- The average customer rating shows a consistent decline over the four quarters, dropping from 3.55 in quarter 1 to 2.40 in quarter 4.
- Quarter 1 starts with a moderately positive rating (between “Okay” and “Good”) but by quarter 4, the average rating has fallen closer to 2.40 which is between “Bad” and “Okay”.
- This steady drop indicates a growing dissatisfaction among the customers with their overall experience throughout the year.

2. **Significant drop between quarter 3 and quarter 4:**

- The most dramatic decrease in rating occurs between quarter 3 (2.96) and quarter 4 (2.40) where the rating drops by approximately 19%.
- This sharp decline suggests that customers were particularly dissatisfied in the later part of the year, possibly due to service issues on product quality concerns that worsened during this period.

3. Transition from positive to negative ratings:

- Quarter 1 had the highest rating at 3.55 suggesting that customers initially had a reasonably positive experience (closer to "Good").
- By quarter 4, the average rating has fallen substantially reaching 2.40 indicating a shift towards overall customer dissatisfaction.

4. Ratings dropped below 3 ("Okay") in quarter 3:

- The average rating dips below 3 ("Okay") starting in quarter 3 (2.96) which means that for the second half of the year, the majority of the customers rated their experience as less than "Okay".
- This is a strong indicator of a turning point in customer sentiment suggesting that there may have been service failures, product issues or unmet expectations during the second half of the year.

5. Customer dissatisfaction reached critical levels in quarter 4:

- With the average rating dropping to 2.40 in quarter 4, this shows that the customers were predominantly giving negative feedback, which could lead to lasting damage to the brand's reputation.

Insights:

1. Urgent need to address service or product quality issues:

- The declining trend in ratings suggests that there are ongoing issues that are negatively affecting the customer experience and these have not been adequately addressed over time.
- By quarter 4, the average rating has fallen dangerously low, indicating that customers are increasingly dissatisfied.
- Conducting a root cause analysis of customer complaints and feedback to identify the primary drivers of dissatisfaction.

2. Potential correlation with shipping delays:

- The sharp drop in average ratings between quarter 3 and quarter 4 aligns with the dramatic increase in shipping delays.
- It is highly likely that the extended shipping times and logistical inefficiencies are contributing to customer dissatisfaction as long waits for orders can lead to frustration and lower ratings.

- Providing clear, real-time updates on shipping progress and offering compensation for delays coukd help mitigate the negative impact on customer satisfaction.

3. Decline in customer satisfaction may lead to lost business:

- If customer satisfaction continues to decline New-Wheels is at risk of losing repeat customers and damaging its brand reputation.
- The significant drop in ratings from “Okay” (3) to “Bad” (2) in the second half of the year suggests that more customers may seek alternative services if these issues are not resolved.
- Offering loyalty programs, exclusive deals for repeat customers and improving post sales customer support could help retain customers who may be considering switching to competitors due to poor service.

4. Negative online reviews may be impacting new business:

- As customer ratings drop, it is likely that negative review are being shared online or through word of mouth which can deter new customers from choosing New-Wheels for their vehicle needs.
- The rise in dissatisfaction could lead to negative online reviews which could further impact the company’s reputation and ability to attract new customers.
- Focus on improving customer feedback mechanism by proactively reaching out to dissatisfied customers to resolve their issues. Additionally, offering incentives for the positive reviews or improving the handling of online reviews could help rebuild trust.

5. Focus on early problem resolution to prevent further decline:

- The downward trend suggests that customers concern may not be adequately addressed leading to escalating dissatisfaction over time. Early problem resolution could help stop this decline.
- Providing quicker, more responsive customer service could help resolve the issues before they lead to negative feedback. Offering personalized support especially in cases of shipping delays or product issues could help restore customer confidence.

6. Re-evaluate product offering or marketing strategies:

- If product quality or marketing strategies are not meeting customer expectations this could also be contributing to the lower ratings.
- Re-assess the product mix and marketing strategies to ensure they align with customer preferences and expectations. This might involve ensuring that vehicles are accurately represented on the website, providing more detailed product description or adjusting marketing messages to align with actual customer experiences.

Question 5: Find the percentage distribution of feedback from the customers. Are customers getting more dissatisfied over time?

Solution Query:

<SELECT QUARTER_NUMBER,

100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Very Bad' THEN 1 ELSE 0 END) / COUNT(*) AS percent_very_bad,

100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Bad' THEN 1 ELSE 0 END) / COUNT(*) AS percent_bad,

100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Okay' THEN 1 ELSE 0 END) / COUNT(*) AS percent_okay,

100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Good' THEN 1 ELSE 0 END) / COUNT(*) AS percent_good,

100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Very Good' THEN 1 ELSE 0 END) / COUNT(*) AS percent_very_good

FROM order_t

GROUP BY QUARTER_NUMBER;

>

Output:

```sql
SELECT QUARTER_NUMBER,
       100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Very Bad' THEN 1 ELSE 0 END) / COUNT(*) AS percent_very_bad,
       100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Bad' THEN 1 ELSE 0 END) / COUNT(*) AS percent_bad,
       100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Okay' THEN 1 ELSE 0 END) / COUNT(*) AS percent_okay,
       100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Good' THEN 1 ELSE 0 END) / COUNT(*) AS percent_good,
       100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Very Good' THEN 1 ELSE 0 END) / COUNT(*) AS percent_very_good
FROM order_t
GROUP BY QUARTER_NUMBER;
```

TEST SQL RUN SQL

Execute ▷

SQL queries passed

Query 1 (Passed): SELECT QUARTER_NUMBER, 100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Very Bad' THEN 1 ELSE 0 END) / COUNT(*) AS percent_very_bad, 100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Bad' THEN 1 ELSE 0 END) / COUNT(*) AS percent_bad, 100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Okay' THEN 1 ELSE 0 END) / COUNT(*) AS percent_okay, 100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Good' THEN 1 ELSE 0 END) / COUNT(*) AS percent_good, 100.0 * SUM(CASE WHEN CUSTOMER_FEEDBACK = 'Very Good' THEN 1 ELSE 0 END) / COUNT(*) AS percent_very_good FROM order_t GROUP BY QUARTER_NUMBER
Output:
Showing 4 rows

quarter_number	percent_very_bad	percent_bad	percent_okay	percent_good	percent_very_good
1	10.96774193548387	11.290322580645162	19.032258064516128	28.70967741935484	30
2	14.885496183206106	14.122137404580153	20.229007633587788	22.137404580152673	28.625954198473284
3	17.903930131004365	22.707423580786028	21.83406113537118	20.96069868995633	16.593886462882097
4	30.65326633165829	29.14572864321608	20.100502512562816	10.050251256281408	10.050251256281408

Observations and Insights:

1. Significant increase in negative feedback:

- There is a clear and consistent rise in negative feedback as the year progresses.

(a) The percentage of very bad feedback starts at 10.97% in quarter 1 and increases dramatically to 30.65% in quarter 4.

(b) Similarly, bad feedback rises from 11.29% in quarter 1 to 29.15% in quarter 4.

This sharp rise in negative feedback suggests that a growing number of customers are increasingly dissatisfied with their experiences particularly towards the end of the year.

2. Decline in positive feedback:

- Good and very good feedback shows a noticeable decline throughout the year.

(a) Very good feedback starts at 30% in quarter 1 and declines sharply to 10.05% in quarter 4.

(b) Good feedback also drops from 28.71% in quarter 1 to just 10.05% in quarter 4.

This decline in positive feedback is concerning as it indicates that fewer customers are having satisfactory or excellent experiences. The dramatic drop between quarter 3 and quarter 4 suggests that customer experience may have deterioted significantly in the latter part of the year.

3. Increasing polarization of feedback:

- As the year progresses, feedback becomes more polarized:

(a) In quarter 1, the feedback is relatively balanced across all categories with a slight skew towards positive feedback. (Good and very good make up almost 59% of the total.)

(b) By quarter 4, the feedback is heavily concentrated at the extremes – 60% of the feedback is either "Very bad" or "Bad" while only 20% is positive ("Good" and "Very good"). This suggests that while some customers may still be satisfied, a large portion of customer base is increasingly unhappy.

This polarization suggests that the company is not consistently delivering positive experiences across its customer base resulting in some customers having very negative experiences while fewer customers are truly satisfied.

4. Steady decline in "Okay" Feedback:

- The percentage of "Okay" feedback remains relatively stable over the first 3 quarters fluctuating around 19-21% but drops slightly to 20.10% in quarter 4.
- While "Okay" feedback does not change as dramatically as the other categories it does not offset the rise in negative feedback indicating that fewer customers are neutral in their experiences. Most customers have moved towards stronger opinions – either positive or negative.

5. Quarter-by-quarter breakdown:

- Quarter 1:

(a) Positive feedback dominates: With 58.71% of feedback falling under "Good" (28.71%) or "Very good" (30%) customer sentiments are mostly positive.

(b) Negative feedback: Negative feedback is relatively low with "Very bad" (10.97%) and "Bad" (11.29%) making up only about 22% of the total.

- Quarter 2:

(a) Slightly shift towards negative: While "Very good" feedback declines from 30% to 28.63%, the share of "Bad" and "Very bad" feedback increases indicating early signs of decline in customer satisfaction.

(b) Good feedback also decreases showing that fewer customers are having excellent experiences.

- Quarter 3:

(a) Notable increase in the negative feedback: "Very bad" and "Bad" feedback increase significantly to 17.9% and 22.7% respectively. This is the first quarter where negative feedback surpasses positive feedback.

(b) The "Good" and "Very good" feedback continues to decline with only 37.6% of customers providing positive feedback compared to 40.61% providing negative feedback.

(c) This marks a tipping point where dissatisfaction have overtaken satisfaction.

- Quarter 4:

(a) Significant drop in customer satisfaction:
The highest levels of “Very bad” (30.65%) and “Bad” (29.15%) feedback occurs in quarter 4. Negative feedback now accounts for nearly 60% of the total, which is alarming.

(a) Positive feedback plummets to only 20% indicating that a vast majority of customers are dissatisfied or neutral at best.

(b) Okay feedback remains stable but does little to offset the overwhelming rise in negative sentiment.

6. Implications for the business:

- Deteriorating customer experience:
  The sharp rise in negative feedback and corresponding drop in positive feedback indicates that the company’s customer experience is deteriorating over time. This could be due to a variety of factors, including poor product quality, delayed deliveries or inadequate customer service.
- Quarter 4 concerns:
  The situation is particularly concerning in quarter 4 where the company traditionally would expect to see higher sales and better feedback due to holiday shopping. The steep rise in dissatisfaction during this period suggests operational or service issues such as unfulfillment demand, shipping delays or poor handling of customer inquiries during the busiest time of the year.
- Risk of reputation damage:
  The sustained increase in negative feedback especially towards the end of the year can have a long impact on the company’s reputation. Poor customer reviews and ratings may discourage new customers and reduce repeat business which could lead to a decline in orders and revenues in future quarters.
- Need for immediate action:
  To reverse this negative trend, the company needs to take immediate action. Key areas for improvement may include:
  (a) Improving operational efficiency particularly around product delivery times and order fulfillment.
  (b) Enhancing customer service by offering quicker and more effective responses to customer issues.
  (c) Addressing product quality issues ensuring that vehicles meet customer expectations and are delivered in excellent conditions.
  (d) Running retention programs targeting dissatisfied customers with offers or discounts to rebuild trust and encourage future purchases.

Conclusion:

The data shows a troubling decline in customer satisfaction over the course of the year with negative feedback surging in quarter 4. The rising dissatisfaction coupled with a significant drop in positive feedback signals serious issues with the company’s customer experience.

Question 6: What is the trend of the number of orders by quarter?

Solution Query:

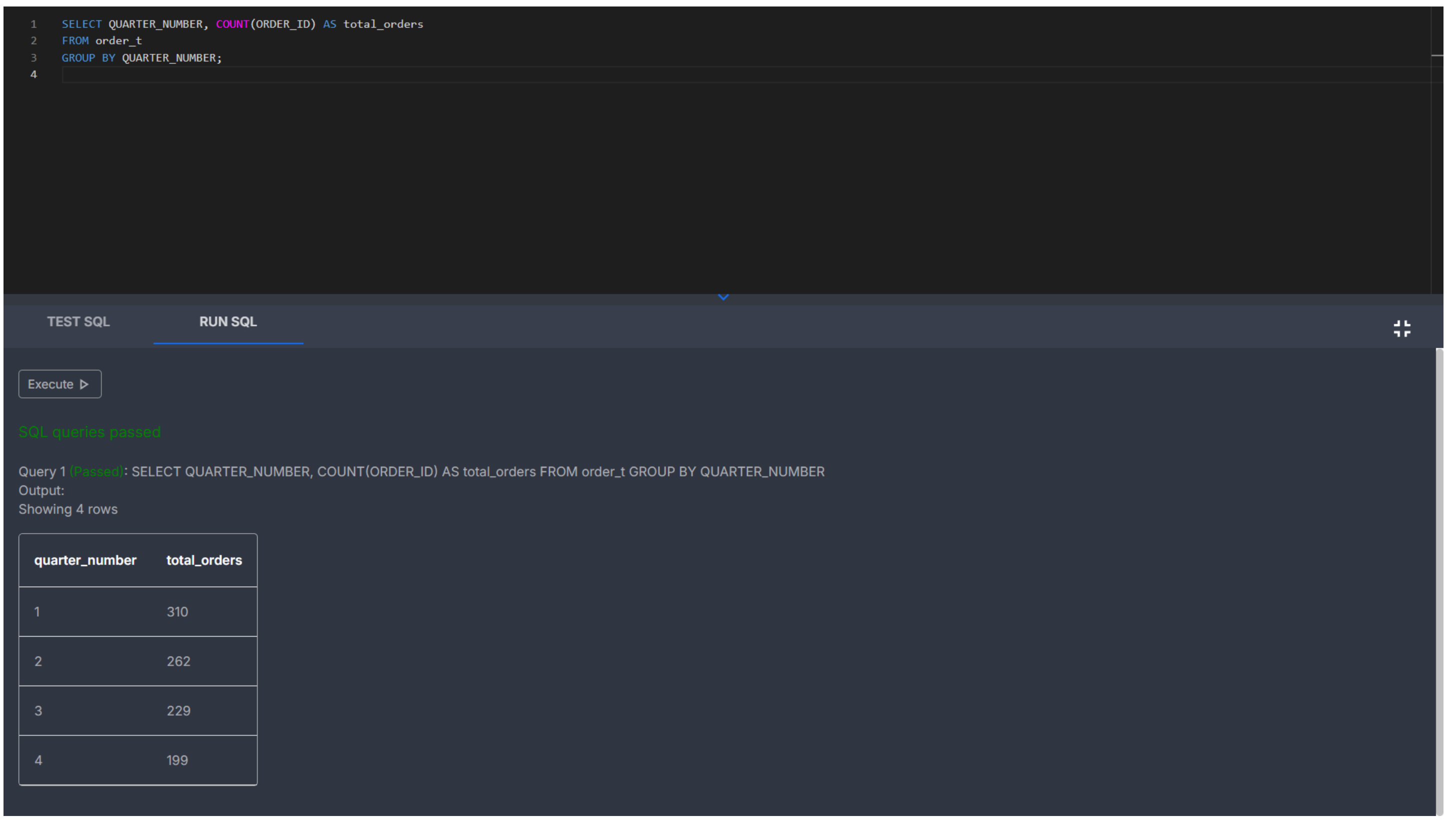
< SELECT QUARTER_NUMBER, COUNT(ORDER_ID) AS total_orders

FROM order_t

GROUP BY QUARTER_NUMBER;

>

Output:



```
SELECT QUARTER_NUMBER, COUNT(ORDER_ID) AS total_orders
FROM order_t
GROUP BY QUARTER_NUMBER;
```

TEST SQL RUN SQL

Execute

SQL queries passed

Query 1 (Passed): SELECT QUARTER_NUMBER, COUNT(ORDER_ID) AS total_orders FROM order_t GROUP BY QUARTER_NUMBER
Output:
Showing 4 rows

quarter_number	total_orders
1	310
2	262
3	229
4	199

Observations and Insights:

1. **Overall decline in order volume:**

- The total number of orders drops steadily from 310 in quarter 1 to 199 in quarter 4, representing a 36% decline in order volume over the course of the year. This decline in order could point to serve underlying issues affecting the business such as decreasing customer interest, operational challenges or external market conditions.

- Quarter 1:
  The year starts strong with 310 orders indicating high customer engagement or demand early in the year. This could be attributed to factors such as seasonal promotions, high customer satisfaction or effective marketing campaigns in the early part of the year.
- Quarter 2:
  A drop of 262 orders in quarter 2 represents a 15% decrease from the previous quarter. While the number of orders is still relatively high, this decline might be the first sign of decreasing customer demand or emerging operational issues. The company may need to investigate whether factors such as reduced marketing efforts, changes in product offerings or customer service challenges contributed to the drop.
- Quarter 3:
  The decline continues in quarter 3, with the total number of orders falling to 229, representing a 12.6% decrease from quarter 2. the ongoing reduction in orders could indicate that the issues contributing to the decline in quarter 2 were not adequately addressed potentially leading to a loss of customer interest or engagement.
- Quarter 4:
  The lowest number of orders occurs in quarter 4, with just 199 orders. This represents a 13.1% decrease from quarter 3 and a significant 36% decline compared to the start of the year. This sharp reduction in orders could signal deeper operational challenges or negative customer experiences (as suggested by declining customer ratings), especially during a time when businesses often expect a surge in demand due to the holiday season.

2. Potential reasons for the decline:

- Customer Dissatisfaction:

(a) The steady drop in order volume corresponds with the decline in the customer satisfaction ratings, average ratings fell from 3.55 in quarter 1 to 2.40 in quarter 4. it is likely that customer dissatisfaction – due to delayed shipping, poor product quality or inadequate customer service – led to the decrease in repeat purchases and new customer acquisition.

- Operational challenges:

(a) The decrease in orders may also be linked to operational inefficiencies. If the company struggled with timely order fulfillment, product availability or managing customer enquiries this could have negatively impacted order volumes over time.

- External factors:

(a) External market factors such as changes in the economy, competitive pressures or seasonal variations may have contributed to the declining order trend. For example, quarter 4 typically sees increased competition from holiday sales across various industries and if the company was unable to capitalize on this or faced stiff competition it could explain the sharp decline in orders during that period.

- Reduced marketing or customer acquisition:

(a) If the company reduced its marketing efforts or failed to invest in customer acquisition strategies, this could have contributed to the drop in order volumes. A lack of targeted campaigns or promotions might have led to fewer new customers, while existing customers may have become disengaged due to unsatisfactory experiences.

3. Quarter 4 – missed opportunities:

- Quarter 4 which typically coincides with the holiday sales and increased consumer spending should have been an opportunity for growth. However, with only 199 orders this quarter saw the lowest order volume. This suggests that the company may have missed out on potential sales opportunities during a crucial period.

(a) The declining trend in customer satisfaction during this quarter (as evidenced by low average ratings) may have been a major factor in reduced order.

(b) The company may not have leveraged holiday promotions or other seasonal campaigns effectively further contributing to the low order count.

4. Impact on business performance:

- Revenue decline:

(a) Fewer orders directly impact revenue and a 36% drop in order volume over the year could result in a significant loss of income. Given the company's high value products (vehicles) each order represents substantial revenue so even a moderate drop in orders would have a large financial impact.

- Operational costs vs revenue:

(a) A continued decline in orders without corresponding reductions in operational costs (example, shipping, inventory management, marketing) could put pressure on the company's profitability. If order volume continues to decrease the company may struggle to cover its fixed costs leading to potential operational inefficiencies and further financial strain.

Conclusion:

The steady decline in total orders from 310 in quarter 1 to 199 in quarter 4 reflects a significant challenge for the company. This drop may be driven by growing customer dissatisfaction, operational inefficiencies or external market pressures. To reverse this trend, the company should focus on improving customer satisfaction, addressing operational issues and revitalizing its marketing efforts, particularly during key periods like quarter 4. By doing so, the company can potentially stabilize order volumes and increase revenue in the coming year.

Question 7: Calculate the net revenue generated by the company. What is the quarter-over-quarter % change in net revenue?

Solution Query:

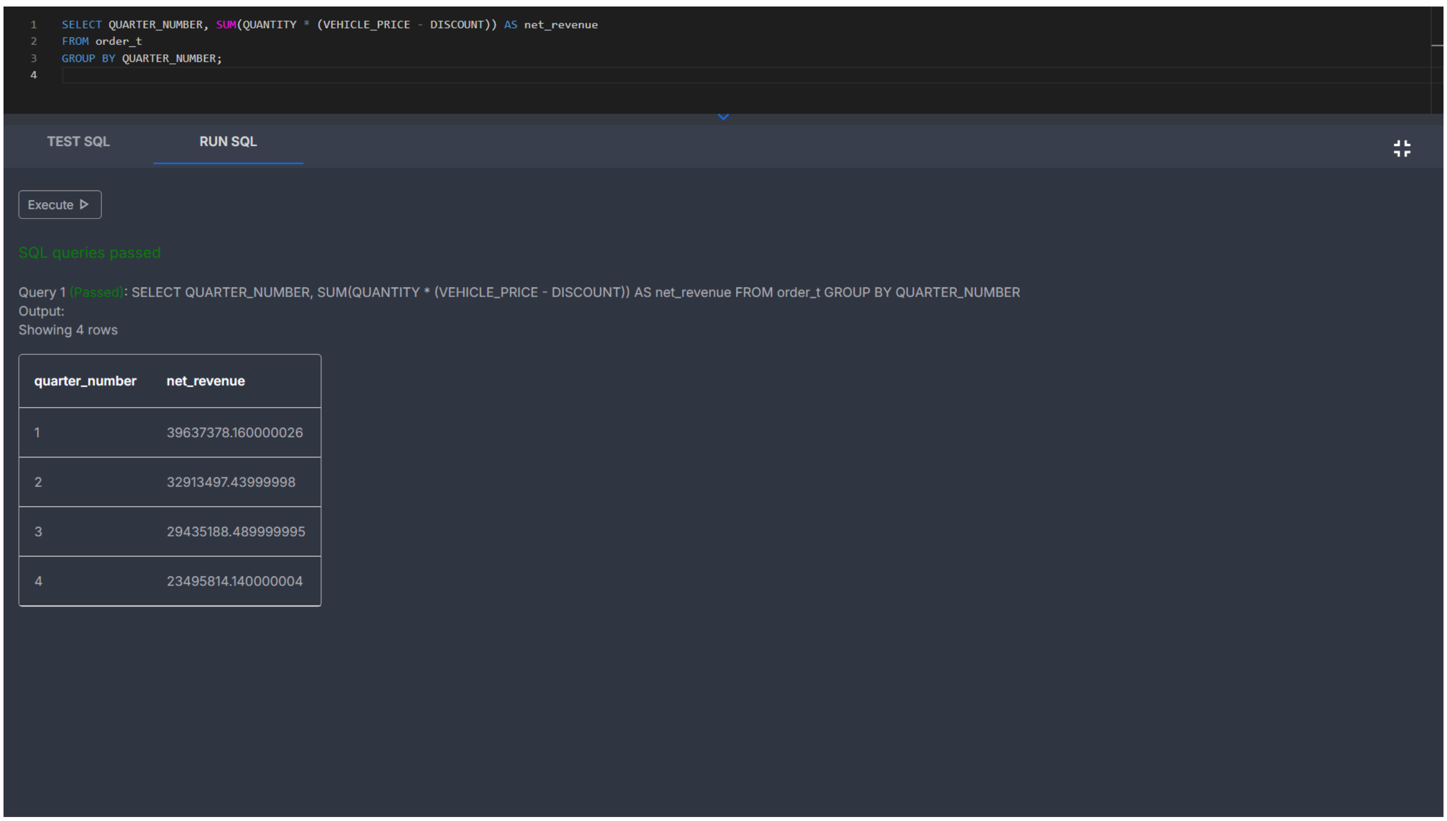
< SELECT QUARTER_NUMBER, SUM(QUANTITY * (VEHICLE_PRICE - DISCOUNT)) AS net_revenue

FROM order_t

GROUP BY QUARTER_NUMBER;

>

Output:



```
SELECT QUARTER_NUMBER, SUM(QUANTITY * (VEHICLE_PRICE - DISCOUNT)) AS net_revenue
FROM order_t
GROUP BY QUARTER_NUMBER;
```

TEST SQL RUN SQL

Execute

SQL queries passed

Query 1 (Passed): SELECT QUARTER_NUMBER, SUM(QUANTITY * (VEHICLE_PRICE - DISCOUNT)) AS net_revenue FROM order_t GROUP BY QUARTER_NUMBER
Output:
Showing 4 rows

quarter_number	net_revenue
1	39637378.160000026
2	32913497.43999998
3	29435188.489999995
4	23495814.140000004

Observations and Insights:

1. **Declining net revenue over the time:**

- Quarter 1 has the highest revenue at $39.6 million.
- From quarter 1 to quarter 4 there is a steady decline in the net revenue with quarter 4 ending at $23.5 million.
- The net revenue in quarter 4 is 41% lower than in quarter 1 indicating significant drop in sales.

2. Largest drop between quarter 3 and quarter 4:

- The largest drop in revenue occurs between quarter 3 and quarter 4. This represents a 20% decline.
- While there is a gradual decrease in earlier quarters, the sharp fall in the final quarter indicates seasonality, market downturns or operational challenges.

3. Consistent decrease across all quarters:

- Each quarter shows a consistent reduction in net revenue:

(a) Quarter 1 to quarter 2: 16.9% drop ($6.72 million)

(b) Quarter 2 to quarter 3: 10.6% drop ($ 3.48 million)

(c) Quarter 3 to quarter 4: 20.2% drop ($5.94 million)

- This consistent downward trend could indicated deeper underlying issues such as weakening customer demand, increased competition, pricing challenges or economic factors affecting consumer spending.

4. Seasonal or external factors:

- The decline in net revenue could be influenced by seasonality in the vehicle resale market where demand typically decreases in certain quarters such as after holiday seasons or in periods of economic downturn.
- External market conditions such as higher interest rates, economic uncertainty or inflation may have impacted customers willingness to spend on vehicles especially pre-owned vehicles which tend to be more sensitive to change in customer sentiment.

5. Potential issues with marketing and consumer retention:

- A steady decline over the year could point to inefficiencies in customer retention or challenges in attracting new customers.
- If the customer base is shrinking or if the company is unable to convert potential leads into actual sales, the overall revenue will continue to drop.

Insights:

1. Need for immediate intervention to boost sales:

- The sharp drop in revenue particularly between quarter 3 and quarter 4 calls for immediate intervention. Strategies like promotional offers, discounts or partnership with popular vehicle maker could help drive sales and reverse the downward trend.

- Quarter 1’s strong performance can be used as a benchmark. Investigating what worked in that period might help recreate similar success in future quarters.

2. Investigate causes of sharp drop in quarter 4:

- The 20% decline in net revenue between quarter 3 and quarter 4 could signal more than just seasonal fluctuations. It may indicate:

(a) Inventory issues: Lack of high-demand vehicle models or brands.

(b) Negative reviews or poor customer experiences from previous quarters may have led to fewer repeat or new customers in quarter 4.

(c) Competitors may have launched aggressive promotions or discounts drawing customers away from New-Wheels.

3. Potential for revenue recovery in high performing quarters:

- Given the strong performance in quarter 1, New-Wheels could focus on replicating marketing strategies, inventory management and customer service efforts that led to higher revenues in that period.
- For example, launching seasonal sales events or introducing new vehicle models could bring back the momentum seen in early quarters.

4. Operational and financial adjustments:

- With declining revenue, New-Wheels may need to evaluate its cost structure to maintain profitability. Lower revenue may require adjustments in:

(a) Operating expenses: Reducing non-essential expenses or optimizing logistics and shipping processes to cut costs.

(b) Inventory management: Better aligning the inventory with customer demand by analyzing which vehicle makers and models are performing well.’

(c) Pricing strategy: Offering more dynamic pricing options based on demand in each quarter.

Question 8: What is the trend of net revenue and orders by quarters?

Solution Query:

<SELECT QUARTER_NUMBER,

SUM(QUANTITY * (VEHICLE_PRICE - DISCOUNT)) AS net_revenue,

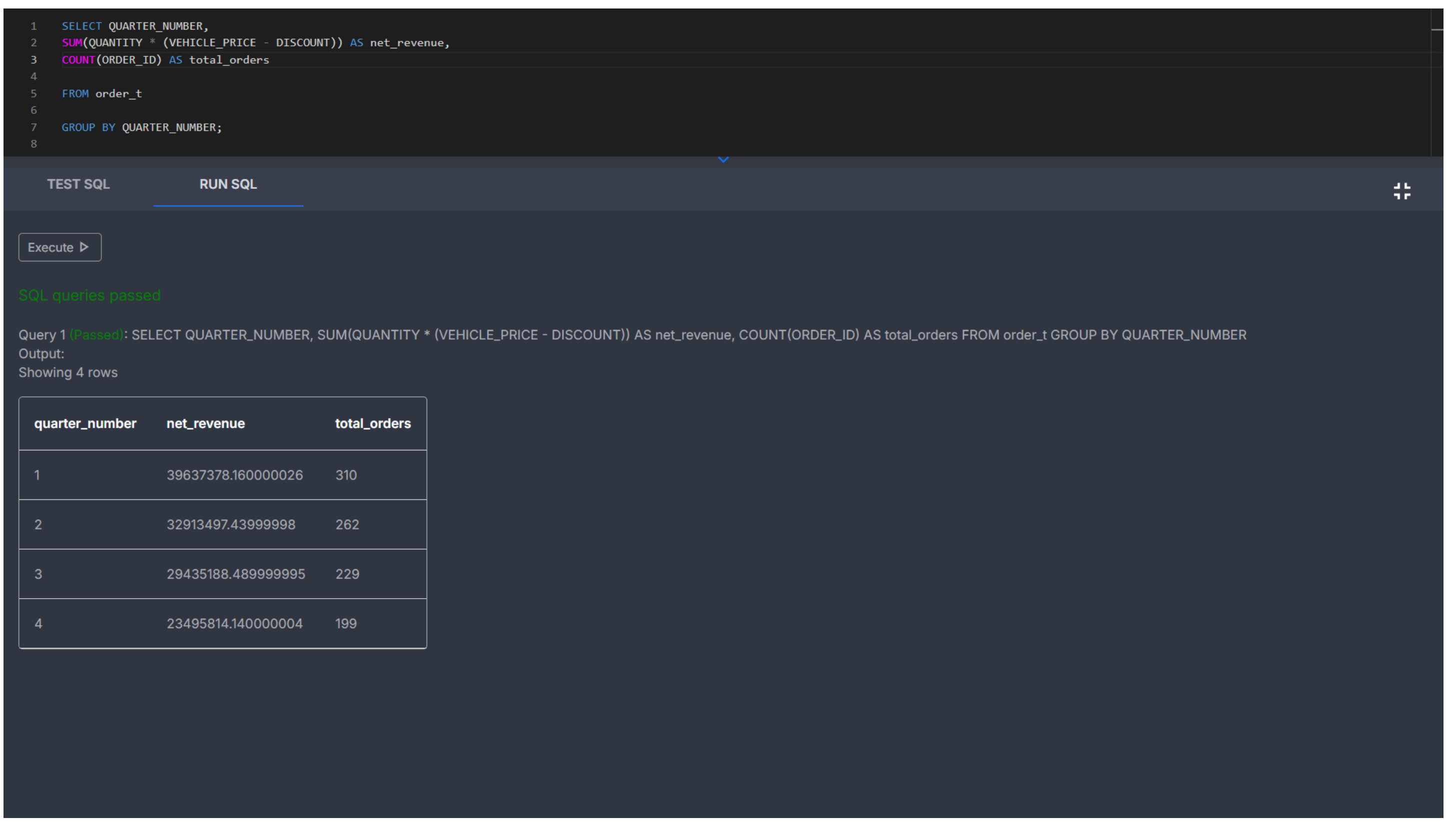
COUNT(ORDER_ID) AS total_orders

FROM order_t

GROUP BY QUARTER_NUMBER;

>

Output:



```
SELECT QUARTER_NUMBER,
SUM(QUANTITY * (VEHICLE_PRICE - DISCOUNT)) AS net_revenue,
COUNT(ORDER_ID) AS total_orders

FROM order_t

GROUP BY QUARTER_NUMBER;
```

TEST SQL RUN SQL

Execute

SQL queries passed

Query 1 (Passed): SELECT QUARTER_NUMBER, SUM(QUANTITY * (VEHICLE_PRICE - DISCOUNT)) AS net_revenue, COUNT(ORDER_ID) AS total_orders FROM order_t GROUP BY QUARTER_NUMBER
Output:
Showing 4 rows

quarter_number	net_revenue	total_orders
1	39637378.160000026	310
2	32913497.43999998	262
3	29435188.489999995	229
4	23495814.140000004	199

Observations and Insights:

Observations:

1. **Consistent decline in both revenue and total orders:**

- Quarter 1 shows the highest performance with 310 orders generating $39.6 million in revenue while quarter 4 has the lowest with 199 orders and 23.5 million in revenue.

2. **Order count and revenue are proportional:**

- The decline in revenue closely mirrors the drop in total orders:

(a) Quarter 1 to quarter 4: Orders decreased by 35.8% and revenue decreased by 40.7%

(b) This suggests that the average order value has remained relatively stable, meaning that the drop in revenue is primarily driven by a decrease in the number of orders rather than significant changes in vehicle pricing or discounts.

3. **Sharpest drop in revenue and orders between quarter 3 and quarter 4:**

- Quarter 3 and quarter 4 shows the sharpest decline in both the total orders and revenue:

(a) Orders decreased by 13% (from 229 to 199)

(b) Revenue decreased by 20% (from $29.4 million to 23.5 million)

- This indicates that quarter 4 is a challenging period for the company, with more pronounced drop in revenue relative to the drop in orders.

4. **Revenue decline rate exceeds order decline rate:**

- The revenue decline is more severe than the drop in orders especially in quarter 3 and quarter 4.
- This suggests that New-Wheels may have applied higher discounts or sold lower priced vehicles in later quarters, leading to lower revenue per order.
  (a) From quarter 3 to quarter 4, total orders dropped by 30 but revenue dropped by nearly $6 million.

Insights:

1. **Consistent decline in business performance:**

- The consistent decline in both orders and revenue indicates that New-Wheels is facing significant challenges in maintaining customer demand. The company may need to focus on improving customer acquisition retention and marketing strategies to reverse this trend.

2. **Potential inventory or market saturation:**

- The steady decrease in order suggests that New-Wheels might be facing inventory management issues or market saturation.

(a) If customers are finding fewer appealing vehicle option, it could lead to fewer sales.

3. Sharp decline in quarter 4 requires attention:

- The steep drop in revenue from quarter 3 to quarter 4 suggests that the company might be experiencing seasonality effects or operational challenges like supply chain disruptions or over reliance on discounts to drive sales.

4. Need to increase average order value:

- While the number of orders is decreasing, it's crucial to find ways to increase the average revenue per order to offset this decline.
- Strategies could include:

(a) Upselling/ cross selling: Offering additional services, accessories or extended warranties at the time of purchase.

(b) Promoting higher-end vehicle models: By focusing on premium vehicles with higher price tags, New-Wheels could generate more revenue per order.

5. Potential for customer retention issues:

- If the number of repeat customers is declining, New-Wheels may be loosing out on significant portion of revenue. This could be due to poor customer satisfaction, negative feedback.

6. Explore new revenue streams:

- With declining revenue, New-Wheels could explore alternative revenue streams, such as:

(a) Offering value added services like vehicle maintenance, detailing or customer upgrades.

- Expanding into new services could not only help boost revenue but also differentiate New-Wheels from competitors.

Question 9: What is the average discount offered for different types of credit cards?

Solution Query:

<SELECT CREDIT_CARD_TYPE, AVG(DISCOUNT) AS avg_discount

FROM customer_t c

JOIN order_t o ON c.CUSTOMER_ID = o.CUSTOMER_ID

GROUP BY CREDIT_CARD_TYPE;

>

Output:

```
SELECT CREDIT_CARD_TYPE, AVG(DISCOUNT) AS avg_discount

FROM customer_t c

JOIN order_t o ON c.CUSTOMER_ID = o.CUSTOMER_ID

GROUP BY CREDIT_CARD_TYPE;

```

TEST SQL RUN SQL

Query 1 (Passed): SELECT CREDIT_CARD_TYPE, AVG(DISCOUNT) AS avg_discount FROM customer_t c JOIN order_t o ON c.CUSTOMER_ID = o.CUSTOMER_ID GROUP BY CREDIT_CARD_TYPE
Output:
Showing first 10 rows out of 16 rows

credit_card_type	avg_discount
americanexpress	0.6825000000000001
bankcard	0.5933333333333334
china-unionpay	0.624
diners-club-carte-blan...	0.6475000000000001
diners-club-enroute	0.665
diners-club-international	0.6
diners-club-us-ca	0.5
instapayment	0.77
jcb	0.6083050847457627
laser	0.6219999999999999

Observations and Insights:

Observations

1. Instapayment offers the highest average discount:

- Instapayment has the highest average discount at 0.77. This suggests that customers using Instapayment cards are receiving more generous discounts compared to users of other card types.
- This could be a part of promotional agreement with Instapayment or simply reflect a strategy to encourage customers to use this card type more frequently.

2. Diners Club cards show variability in discounts:

- The various Diners Club card types have different average discounts:

(a) Diners Club Carte Blanche: 0.6475 (64.75%)

(b) Diners Club Enroute: 0.665 (66.5%)

(c) Diners Club International 0.6 (60%)

(d) Diners Club US/CA: 0.5 (50%)

- While Diners Club cardholders overall receive decent discounts, there is a variability across different Diners Club card categories. For example, Diners Club US/CA offers the lowest discount among this group at 50% which could indicate fewer promotions or lower usage in certain regions.

3. American Express offers competitive discounts:

- American Express cardholders receive an average discount of 68.25% placing it among the highest discount categories.
- American Express is often considered with higher income consumers and luxury purchases so offering competitive discounts for this card type could help New-Wheels attract and retain premium customers.

4. Moderate discounts for JCB and China Union Pay:

- Both JCB and China Union Pay offers moderate discounts at 60.83% and 62.4% respectively.
- These discounts could reflect New-Wheels efforts to cater to international customers or specific geographic regions where these cards are commonly used such as Asia.

5. Laser and Bankcard offers similar discounts:

- Laser (62.2%) and Bankcard (59.3%) show relatively similar discount levels indicating consistent approach to promotions for these card types.
- These discounts are close to the average across all card types, suggesting New-Wheels may be offering more standard promotions for customers using less prominent card networks.

6. **Diners Club US/CA has the lowest discount:**

- The Diners Club US/CA card type offers the lowest average discount at 50%.
- This lower discount may reflect less aggressive promotions or fewer marketing efforts aimed at this specific card type.

Insights:

1. **Targeted promotions based on card types:**

- The variation in average discounts across credit card types suggests that targeted promotions are being used to drive transactions with specific cards. Higher discounts are offered for certain card types (Example, Instapayment, American Express) possibly due to the partnership agreement or to encourage customers to use specific payment methods.

2. **Customer segmentation and preferences:**

- Customers using different card types are likely from different market segments. For example American Express customers may belong to higher income demographic while Diners Club or JCB card holders may represent international or niche customer segments.

3. **Opportunity to improve discounts for underutilized card types:**

- Certain card types such as Diners Club US/CA and Bankcard have lower discounts. There could be an opportunity to increase promotions for these cards, potentially driving higher usage and improving transaction volumes through these networks.

4. **Analyze discount strategies for better ROI:**

- The variability in discounts suggests that New-Wheels should evaluate whether higher discounts for certain card types (like Instapayment) are driving a sufficient increase in sales to justify the reduced revenue per transaction.

  This suggests that New-Wheels is using targeted discount strategy to attract specific customer segments and encourage the use of certain card types.

Question 10: What is the average time taken to ship the placed orders for each quarter?

Solution Query:

<

SELECT QUARTER_NUMBER,

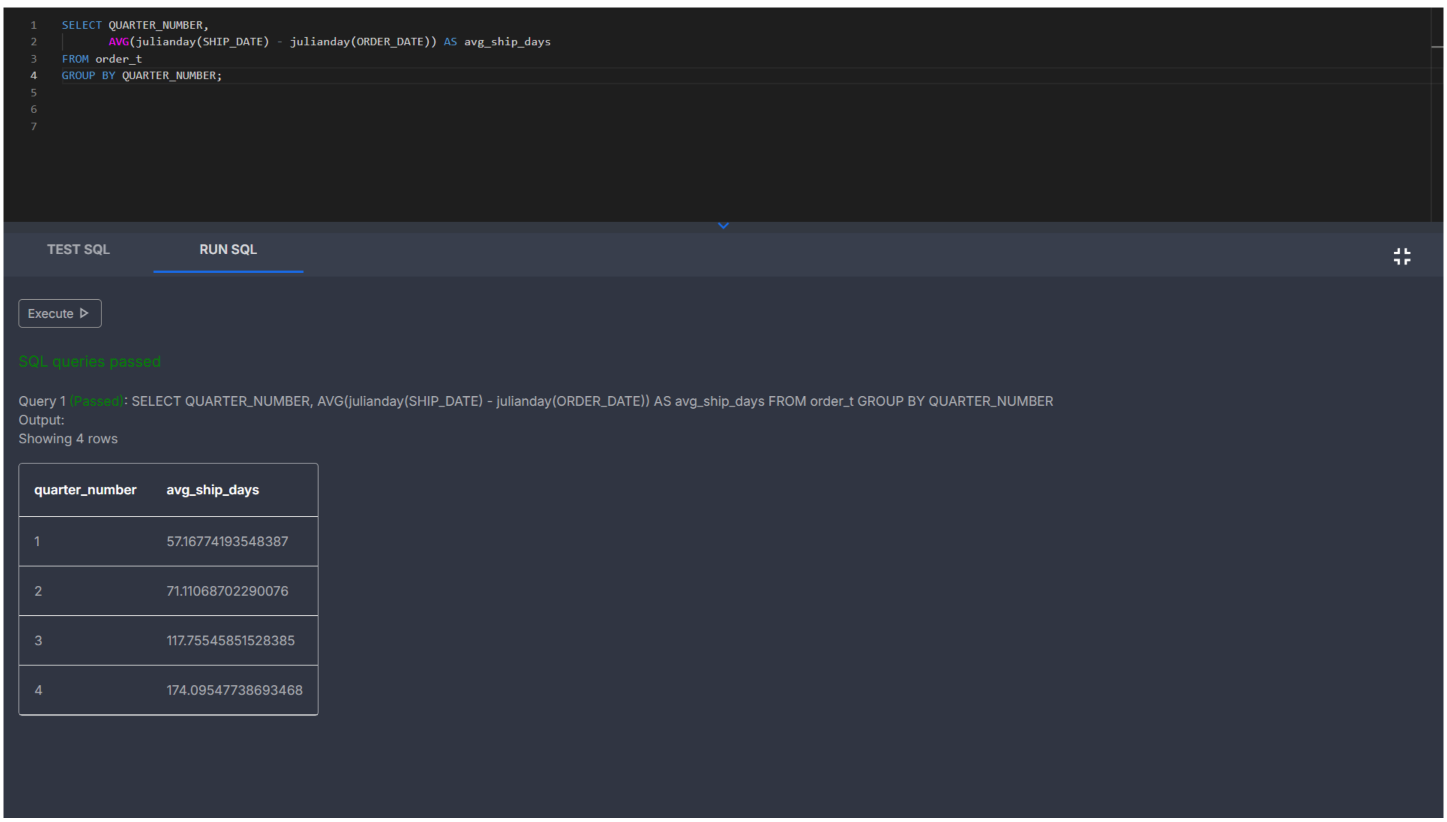
    AVG(julianday(SHIP_DATE) - julianday(ORDER_DATE)) AS avg_ship_days

FROM order_t

GROUP BY QUARTER_NUMBER;

>

Output:



Observations and Insights:

Observations:

1. Significant increase in shipping times over time:

- There is a consistent and sharp increase in the average shipping days across all the 4 quarters.
- Quarter 1 had the lowest average shipping time of around 57 days while quarter 4 reached a staggering 174 days on an average.
- This means that the shipping time is tripled from quarter 1 to quarter 4 which suggests significant operational challenges.

2. Major jump in shipping time between quarter 3 and quarter 4:

- The largest increase in the shipping days occurs between quarter 3 and quarter 4 where average shipping time jumps from 117.76 days to 174.10 days – an increase of 48% in just one quarter.
- This sharp increase suggests that the problem may have worsened significantly in the later part of the year, indicating either operational bottlenecks, supply chain disruptions or logistic inefficiencies.

3. Deterioration of shipping performance:

- The deterioration od shipping performance can be seen throughout the year, as each quarter shows an increase in the average number of shipping days.
- Quarter 1 started with a manageable shipping period but by quarter 4, the company took an average of nearly 6 months to ship the order.

4. Potential negative impact on customer satisfaction:

- Long shipping times particularly over 100 days in quarter 3 and quarter 4 are likely to result in negative customer experiences. Delays of this magnitude can lead to customer dissatisfaction, increased complaints and potential loss of repeat business.
- This is especially critical in the vehicle resale market where customers may expect timely delivery to meet their transportation needs. Extended delays could lead to negative online reviews, refund requests or cancellations.

5. Seasonality or external factors affecting logistics:

- While some increase in shipping times may be expected due to seasonal factors, the scale of the increase seen in this data suggests more than just seasonal issues.
- External factors such as global supply chain disruptions, labor shortages or transportation issues could have contributed to the delays, particularly in later quarters.

Insights:

1. Urgent need for operational efficiency improvement:

- The substantial increase in shipping times throughout the year points out to serious operational inefficiencies that need to be addressed immediately.

- Logistic processes and supply chain management should be audited to identify bottlenecks and inefficiencies. This could involve reviewing shipping partners, optimizing warehouse operations and improving inventory management to ensure faster fulfillment.

2. Impact on customer retention and business reputation:

- Shipping delays of this magnitude are likely to negatively affect customer retention. Customers who experience long waits for their orders are less likely to return for future purchases and more likely leave negative feedback.

3. Addressing quarter 4 issues:

- The sharp increase in quarter 4 shipping times (from 117.76 days to 174.10 days) could indicate a specific seasonal or operational challenge that needs to be closely analyzed. For example, the holiday season might have added strain to logistics or the company may have been facing issues with inventory availability or supplier delays.

4. Potential supply chain issues:

- The dramatic rise in shipping times might indicate supply chain disruptions, particularly in the later quarters. This could involve delays in sourcing vehicles, transport issues or labor shortages that slow down the shipping process.

5. Risk of losing competitive advantage:

- In a competitive market, long shipping times could make customers turn to competitors with faster delivery times. Other vehicle resellers or online platforms that offer quicker fulfillment could capture a larger share of the market, especially if customers start perceiving New-Wheels as unreliable.

6. Scaling for demand or inventory constraints:

- The increase in shipping times might also indicate that the company is struggling to scale its operations to meet demand. If inventory availability is an issue, New-Wheels may need to improve inventory forecasting and ensure that vehicles are in stock and ready to ship promptly when orders are placed.

By improving supply chain resilience, optimizing shipping processes and maintaining better communication with customers, New-Wheels can work to reverse this negative trend and maintain its competitive position in the market. Immediate action is needed, particularly to avoid the recurrence of such significant delays in the future quarters.

Business Metrics Overview:

Total Revenue	Total Orders	Total Customers	Average Rating
<125481878.229>	<1000>	<994>	<3.135>
Last Quarter Revenue	**Last quarter Orders**	**Average Days to Ship**	**% Good Feedback**
<23495814.140>	<199>	<97.964>	<44.1>

Business Recommendations:

Based on these insights from the SQL queries and business metrics, here are the comprehensive recommendations to help New Wheels to improve its overall performance and address the challenges highlighted in the analysis:

1. **Enhance the customer satisfaction and feedback management:**

- The analysis of customer feedback shows a significant distribution of ratings across “Bad”, “Okay” and “Very Bad” categories, indicating growing customer dissatisfaction over time. This trend can negatively impact customer retention and deter potential new customers, especially as reviews and feedback are critical in the online vehicle resale market.

Recommendations:

- Customer support improvement:
  Invest in a robust customer support system to pro-actively address issues that lead to negative feedback such as delays in shipping or vehicle quality discrepancies.
- After sales service:
  Improve after sales services particularly in providing timely responses to customer inquiries and offering better warranty or return options for pre-owned vehicles.
- Feedback follow-up program:
  Implement a structured follow up mechanism to address negative feedback. Contact customers who left bad reviews and offer solutions such as discounts, free services on vehicle upgrades to restore their satisfaction.
- Customer feedback loop:
  Use regular feedback surveys to identify recurring issues and take immediate action. This will help in maintaining customer satisfaction and provide early signals to prevent further negative feedback.

2. Tailor regional sales strategies based on the preferences:

- The vehicle maker preference analysis shows a significant regional difference. Some states may prefer specific car brands which implies the need for localized inventory management and marketing.

Recommendations:

- Localized marketing campaigns:
  Develop state-specific marketing campaigns to promote the preferred vehicle brands in those regions. For example, if a certain brand is popular in one state use the targeted ads and social media campaigns to boost sales of that in the region.
- Inventory optimization:
  Focus on stocking more of the popular vehicle brands in each state. Reducing the inventory of low-demand brands can save costs and help to allocate resources to the brands that sell more effectively in specific regions.
- Partnerships with top vehicle makers:
  Strengthen relationships with the top 5 vehicle makers preferred by customers. Negotiate exclusive deals with better pricing or additional incentives that could further increase the demand for these brands.

3. Streamline logistics and improve shipping times:

- The analysis of shipping times shows variability in delivery times which can contribute to customer dissatisfaction. Reducing the time taken to ship vehicle after an order is placed will greatly improve the overall customer experience.

Recommendations:

- Optimize the shipping routes:

Re-evaluate and optimize the logistics network to reduce shipping time. Partner with efficient shipping provides or improve the internal shipping processes.

- Shipping time guarantees:
  Introduce guaranteed shipping times for the customers who order vehicles from within the certain geographical zones. Offering expedited shipping for an additional fee might also be an attractive option for the customers in urgent need of a vehicle.
- Warehouse network expansion:
  Consider expanding the warehouse network to more locations across the country. This will reduce the shipping time by allowing the company to deliver vehicles from a closer location.
- Real-time shipping updates:
  Improve communication by providing customers with real-time updates about their order status, including expected delivery dates which can enhance the customer satisfaction.

4. Revenue growth and profitability enhancement:

- The trend of net revenue across quarters shows fluctuations and while revenue is generated, the company could explore strategies to maintain consistent growth across all quarters especially during slower months.

Recommendations:

- Seasonal promotions:
  Introduce seasonal discounts and promotional events to boost sales in quarters that typically experience lower revenue. Offering time-sensitive deals can drive up demand.
- Dynamic pricing model:
  Implement a dynamic pricing strategy where vehicle price fluctuates based on demand and inventory levels. Higher demand vehicles can be priced at a premium while slow moving inventory could be discounted to clear stocks.
- Customer loyalty programs:
  Launch a loyalty program that rewards repeat customers with discounts or incentives membership programs offering exclusive access to new inventory and special promotions could increase customer retention.
- Partnerships and sponsorships:
  Partner with financial institutions, automotive accessory providers or insurance companies to create bundled offers that make it more attractive for customers to buy vehicles. This could involve discounts on financing, free accessories or discounted insurance for a certain period.

5. Increase payment flexibility and credit card offers:

- The analysis of credit card discounts show that customers are taking the advantage of discounts tied to the specific credit card types. Providing more flexible payment options or increasing the discounts could further drive sales.

Recommendations:

- Expand credit card partnerships:
  Partner with more credit card companies to offer exclusive discounts and promotions. This will encourage customers to use certain cards and increase conversion rates.
- Installment plans:
  Offer interest free installment plans for customers who want to spread the cost of their vehicle purchase over time. This option could make higher-priced vehicles more accessible to a broader audience.
- Cashback offers:
  Collaborate with card issuers to offer cashback rewards or additional savings on purchases. This could be marketed as a special offer to encourage new purchases, especially during slower quarters.

6. Optimize inventory management and supplier relationships:

- Understanding which vehicle brand and models are selling best will help New-Vehicle optimize its inventory and supplier relationships.

Recommendations:

- Inventory demand forecasting:
  Using predictive analytics to forecast demand for specific vehicle brands and models based on historical sales trend and customer preferences. This will allow the company to maintain an optimal inventory level without overstocking or running out of high-demand vehicles.
- Supplier negotiations:
  Use sales data to negotiate better deals with suppliers. For example, demonstrating the high demand for a particular vehicle maker can help secure better pricing or favorable delivery terms from the manufacturer.
- Diversify vehicle offerings:
  If certain vehicle makers consistently rank low in sales, consider reducing or replacing them with newer or more popular brands that align with customer preferences.

7. Maximize customer lifetime value:

- Retaining existing customer is much cheaper than acquiring new ones. Focusing on improving the overall experience can increase customer lifetime value (CLV).

Recommendations:

- After sales support:

Build a strong after-sales support system where customers can easily resolve issues with their purchases, such as minor repairs or warranty claims. This will improve customer trust and increase the likelihood of repeat purchases.

- Referral programs:
  Implement a referral program where existing customers can refer new customers and receive discounts or rewards for the successful referrals. This incentivizes word-of-mouth marketing and increases sales without major advertising costs.
- Customer segmentation:
  Segment customers based on their purchasing history and feedback them tailor offer and promotions to meet their needs. For example, customers who consistently purchase luxury cars can be targeted with high-end promotions.

8. Focus on improving customer experience via technology:

- Technology plays a key role in providing a seamless customer experience from browsing and selecting vehicles to tracking order and providing the feedback.

Recommendations:

- Mobile app improvement:
  Enhance the New-Wheels app's functionality to improve the user experience. Include features like AI powered vehicle recommendations based on previous searches, easier navigation and personalized offers.
- Feedback integration:
  Enable in-app feedback systems where customers can easily provide ratings and reviews post purchase. This will allow the company to monitor and address issues in real-time.
- Data driven decision making:
  Leverage the customer data collected through the app to better understand their preferences, buying patterns and feedback then make data-driven decisions about the inventory, marketing and customer service.

By implementing these recommendations, New-Wheels can address customer dissatisfaction, optimize vehicle inventory, improve logistics and foster long-term customer relationships. These initiatives will lead to increased revenue, customer retention and a stronger competitive edge in the vehicle resale market.