NEW WHEELS PROJECT

1. PROBLEM STATEMENT:

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.

2. 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.

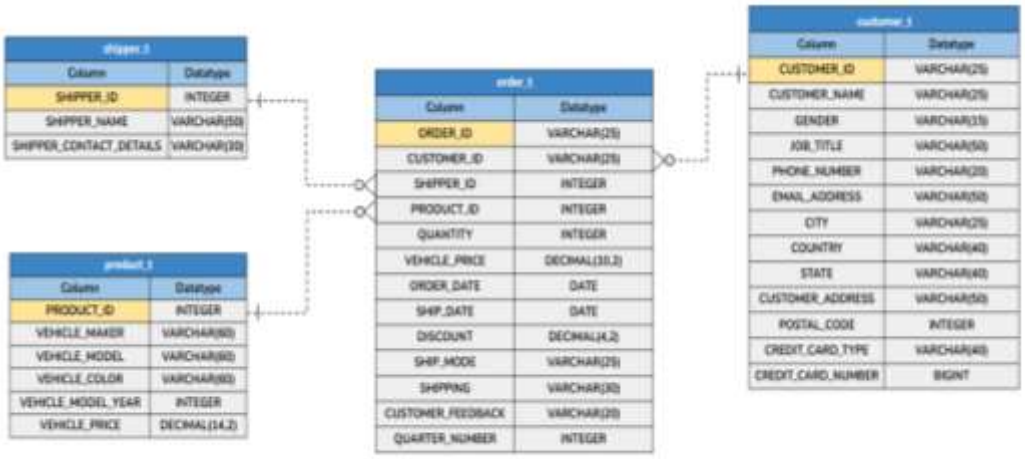
As a data analyst, you see that there is an array of questions that are being asked at the leadership level that need to be answered using data. Import the dump file that contains various tables that are present in the database. Use the data to answer the questions posed and create a quarterly business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

3. DATA DICTIONARY:

- shipper_id: Unique ID of the Shipper
- shipper_name: Name of the Shipper
- shipper_contact_details: Contact detail of the Shipper
- product_id: Unique ID of the Product
- vehicle_maker: Vehicle Manufacturing company name
- vehicle_model: Vehicle model name
- vehicle_color: Color of the Vehicle
- vehicle_model_year: Year of Manufacturing
- vehicle_price: Price of the Vehicle
- quantity: Ordered Quantity

- customer_id: Unique ID of the customer
- customer_name: Name of the customer
- gender: Gender of the customer
- job_title: Job Title of the customer
- phone_number: Contact detail of the customer
- email_address: Email address of the customer
- city: Residing city of the customer
- country: Residing country of the customer
- state: Residing state of the customer
- customer_address: Address of the customer
- order_date: Date on which customer ordered the vehicle
- order_id: Unique ID of the order
- ship_date: Shipment Date
- ship_mode: Shipping Mode/Class
- shipping: Shipping Ways
- postal_code: Postal Code of the customer
- discount: Discount given to the customer for the particular order by credit card in percentage4.
- credit_card_type: Credit Card Type
- credit_card_number: Credit card number
- customer_feedback: Feedback of the customer
- quarter_number : Quarter Number

4. ER DIAGRAM:

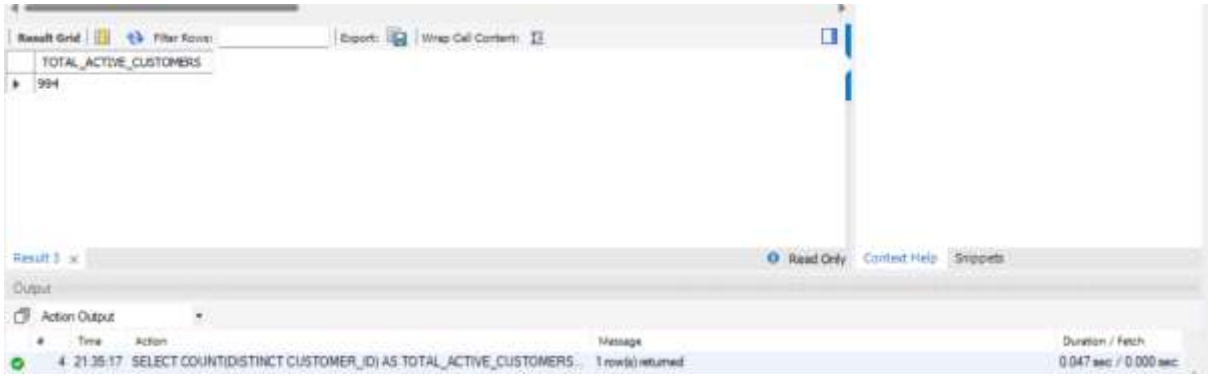


BUSINESS QUESTIONS:

1(a). Find the total number of customers who have placed orders.

Solution Query & Output:

```
SELECT COUNT(DISTINCT Customer_ID) AS TOTAL_ACTIVE_CUSTOMERS
FROM Order_t;
```



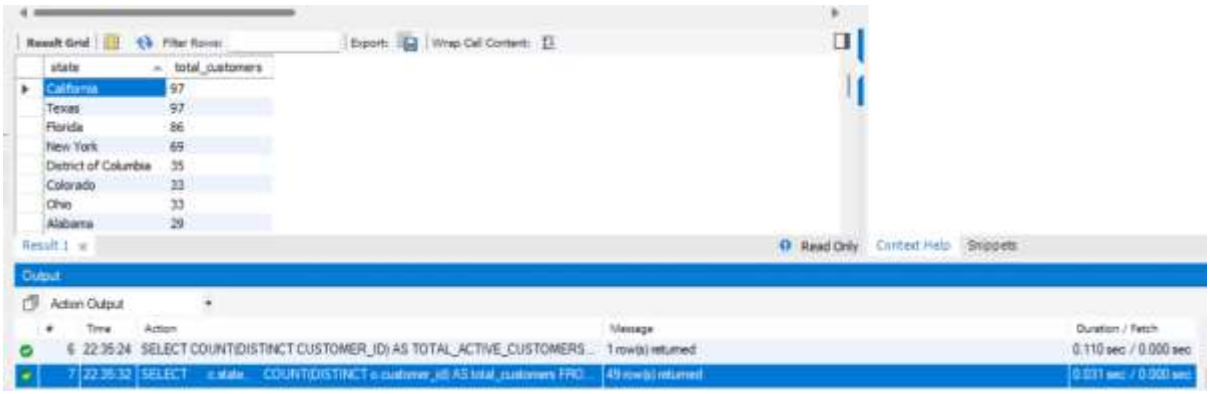
Observation & Insights:

- A total of 994 unique customers have placed orders, indicating a strong active customer base.

1(b). What is the distribution of the customers across states?

Solution Query & Output:

```
SELECT
   c.state,
   COUNT(DISTINCT o.customer_id) AS total_customers
FROM order_t o
JOIN customer_t c
   ON o.customer_id = c.customer_id
GROUP BY c.state
ORDER BY total_customers DESC;
```



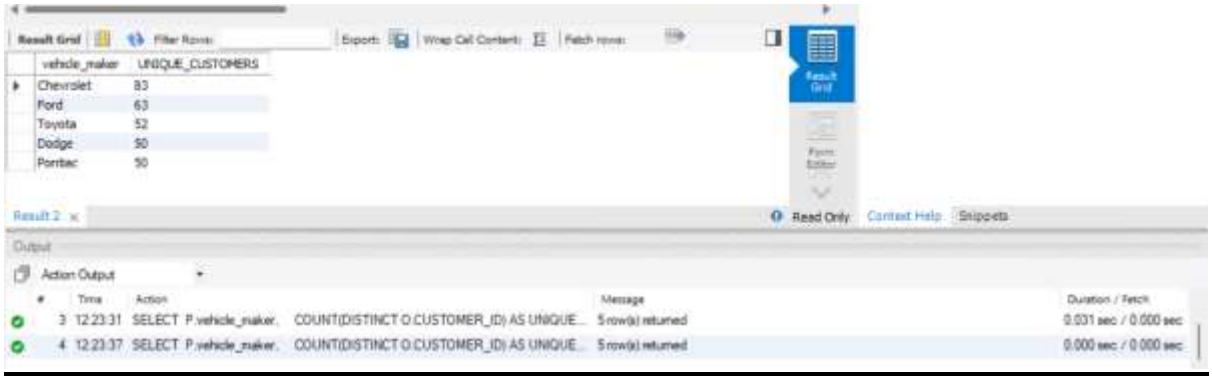
Observation & Insights:

- The highest number of customers are concentrated in **California and Texas (97 each)**, followed by **Florida (86)** and **New York (69)**, indicating strong customer engagement and higher market penetration in these key states.
- States such as **Maine, Vermont, and Wyoming** show minimal customer presence, highlighting limited market reach.

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

Solution Query & Output:

```
SELECT
        p.vehicle_maker,
   COUNT(DISTINCT O.CUSTOMER_ID) AS UNIQUE_CUSTOMERS
FROM order_t o
JOIN product_t p
   ON o.product_id = p.product_id
GROUP BY p.vehicle_maker
ORDER BY unique_customers DESC
LIMIT 5;
```



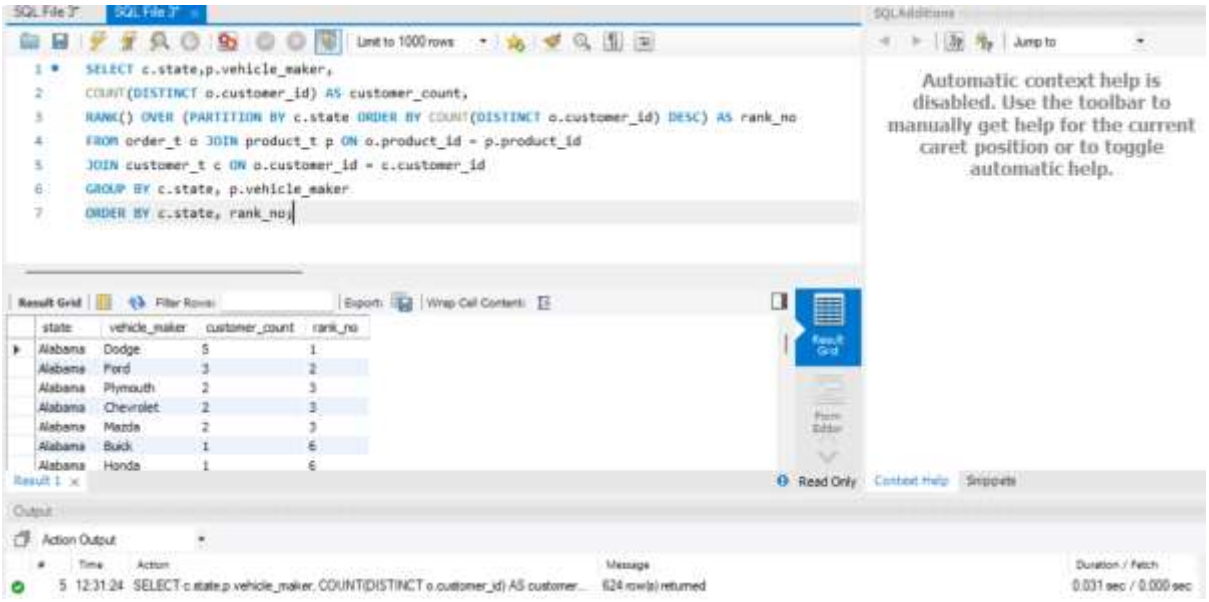
Observation & Insights:

- **Chevrolet** is the most preferred vehicle maker with **83 unique customers**, indicating strong customer demand and brand popularity.
- **Ford** ranks second with **63 customers**, followed by **Toyota (52)**, **Pontiac (50)**, and **Dodge (50)**, reflecting steady demand across multiple brands.
- Customer preference is evenly spread across other makers, showing no strong brand dominance.

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

Solution Query & Output:

```
SELECT c.state,p.vehicle_maker,
COUNT(DISTINCT o.customer_id) AS customer_count,
RANK() OVER (PARTITION BY c.state ORDER BY COUNT(DISTINCT o.customer_id)
DESC) AS rank_no
FROM order_t o JOIN product_t p ON o.product_id = p.product_id
JOIN customer_t c ON o.customer_id = c.customer_id
GROUP BY c.state, p.vehicle_maker
ORDER BY c.state, rank_no;
```



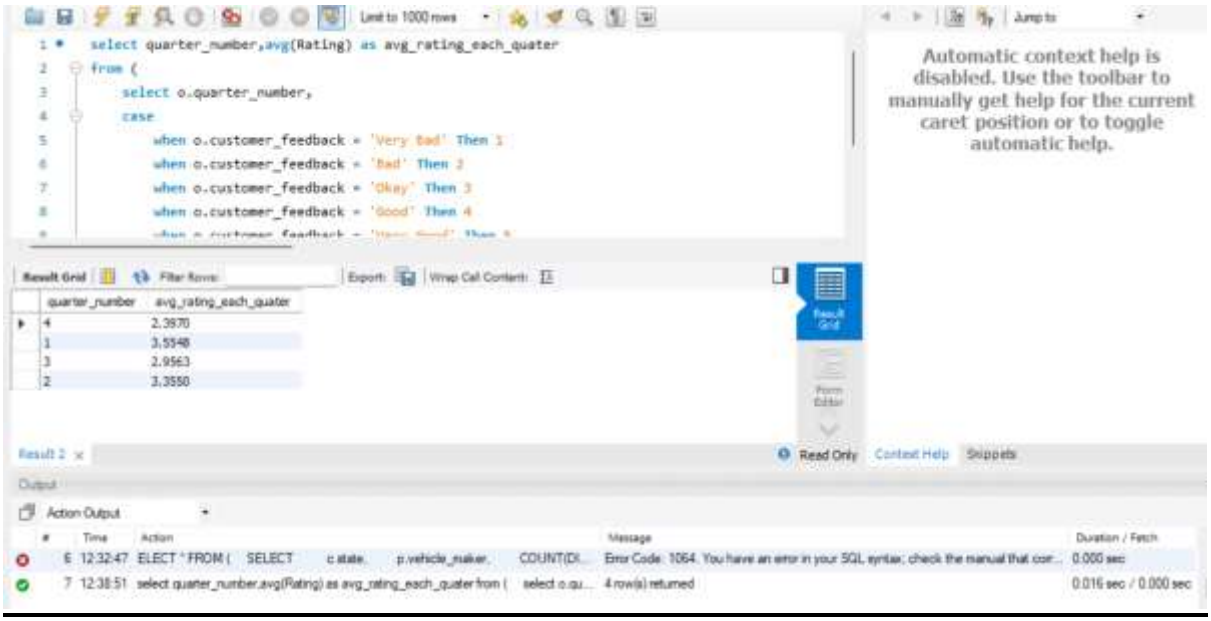
Observation & Insights:

- Chevrolet emerges as the most preferred brand across several states, including Texas, Colorado, Ohio, and Washington, indicating strong nationwide demand and brand presence.
- Toyota, Ford, Dodge, and Pontiac also rank among the top choices in multiple states, reflecting broad customer trust and consistent market acceptance across regions.
- In smaller states with fewer orders, customer preferences appear more evenly distributed, with multiple brands sharing the top position due to lower purchase volumes.

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

Solution Query & Output:

```
select quarter_number,avg(Rating) as avg_rating_each_quater
from (
   select o.quarter_number,
   case
      when o.customer_feedback = 'Very Bad' Then 1
      when o.customer_feedback = 'Bad' Then 2
      when o.customer_feedback = 'Okay' Then 3
      when o.customer_feedback = 'Good' Then 4
      when o.customer_feedback = 'Very Good' Then 5
      else null
   end as Rating
   from order_t o
) as feedback_ratings
group by quarter_number;
```



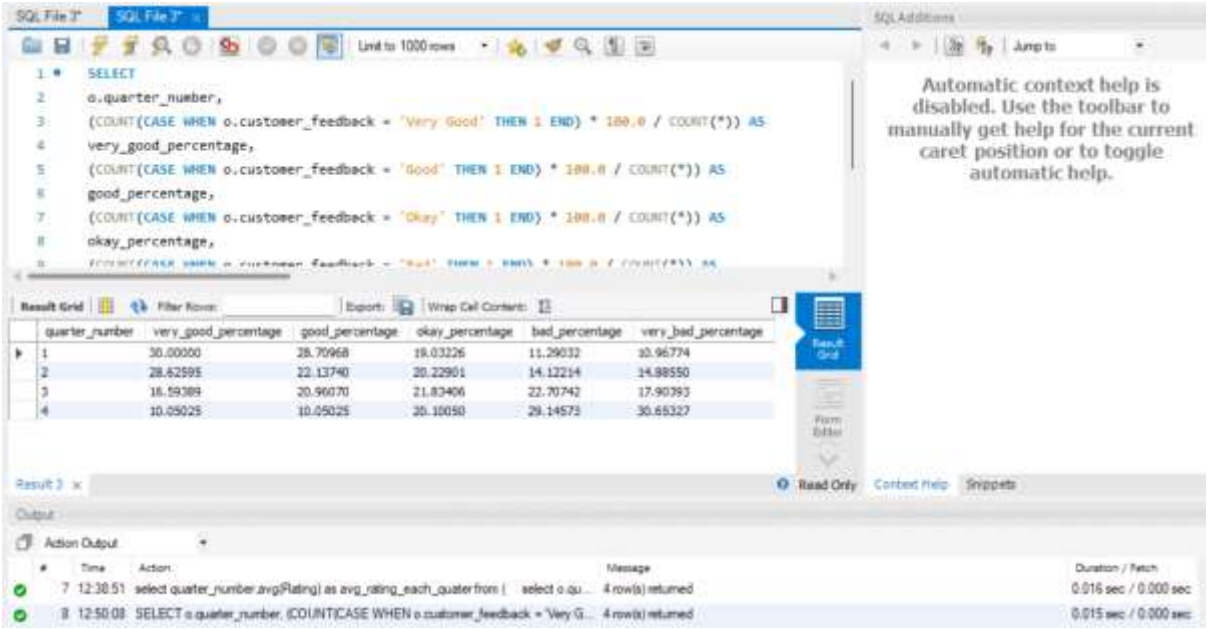
Observation & Insights:

- Overall customer satisfaction remains **moderate**, with quarterly average ratings fluctuating between **2.4 and 3.6**, indicating inconsistent service quality throughout the year.
- **Quarter 1 recorded the highest average rating (3.55)**, reflecting a positive customer experience and stronger service performance during the early part of the year.
- **Quarter 4 showed the lowest rating (2.39)**, suggesting a noticeable decline in customer satisfaction toward year-end.
- Addressing Q4 issues and applying Q1 best practices can improve overall satisfaction.

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

Solution Query & Output:

```
SELECT
o.quarter_number,
(COUNT(CASE WHEN o.customer_feedback = 'Very Good' THEN 1 END) * 100.0 /
COUNT(*)) AS
very_good_percentage,
(COUNT(CASE WHEN o.customer_feedback = 'Good' THEN 1 END) * 100.0 / COUNT(*))
AS
good_percentage,
(COUNT(CASE WHEN o.customer_feedback = 'Okay' THEN 1 END) * 100.0 / COUNT(*))
AS
okay_percentage,
(COUNT(CASE WHEN o.customer_feedback = 'Bad' THEN 1 END) * 100.0 / COUNT(*))
AS
bad_percentage,
(COUNT(CASE WHEN o.customer_feedback = 'Very Bad' THEN 1 END) * 100.0 /
COUNT(*)) AS
very_bad_percentage
FROM order_t o
GROUP BY o.quarter_number
ORDER BY o.quarter_number;
```



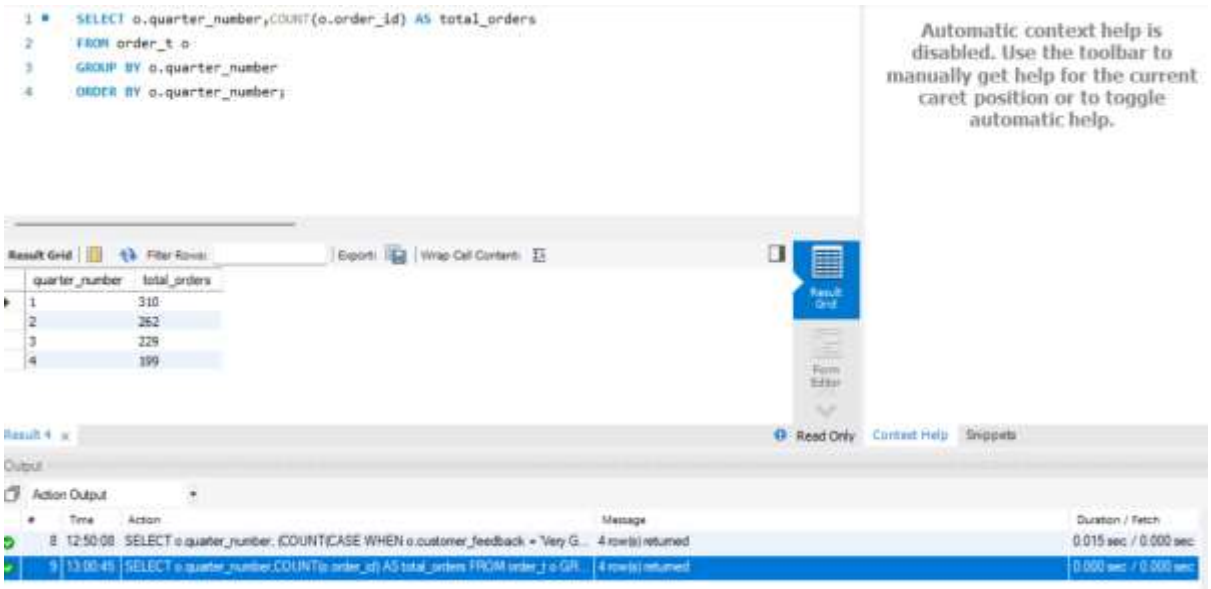
Observation & Insights:

- Customer satisfaction shows a **consistent decline across quarters**, indicating a gradual deterioration in overall service quality over time.
- In **Quarter 1**, nearly **59% of customers provided "Good" or "Very Good" feedback**, reflecting strong customer satisfaction and a positive service experience.
- By **Quarter 4**, positive feedback fell sharply to around **20%**, while negative feedback increased to nearly **60%**, highlighting a significant drop in customer perception.
- This noticeable shift toward negative sentiment suggests growing dissatisfaction, which may contribute to lower customer retention and declining sales.
- It is recommended that the company **closely review operations during Q3 and Q4**, identify key service gaps, and implement corrective measures to restore customer trust and improve overall experience.

6. What is the trend of the number of orders by quarter?

Solution Query & Output:

```
SELECT o.quarter_number,COUNT(o.order_id) AS total_orders
FROM order_t o
GROUP BY o.quarter_number
ORDER BY o.quarter_number;
```



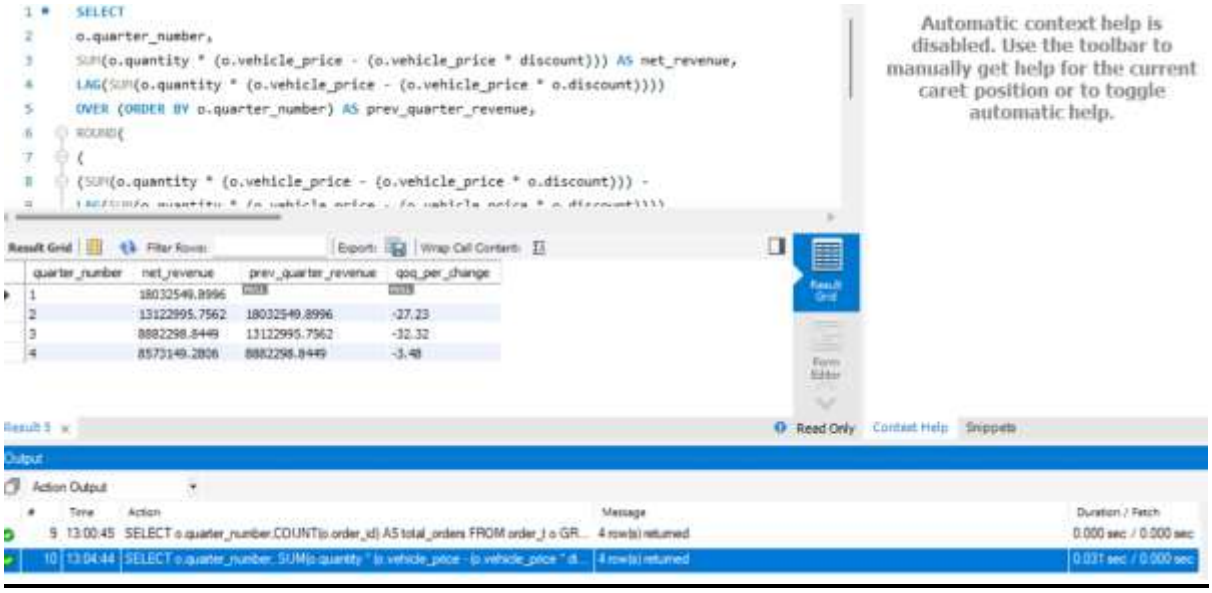
Observation & Insights:

- **Quarter 1** recorded the highest orders (310), indicating strong demand at the start of the year.
- Orders declined steadily through **Q2 (262)** and **Q3 (229)**, showing weakening customer engagement.
- **Quarter 4** reported the lowest orders (199), marking the poorest performance of the year.
- The continuous downward trend suggests possible issues with customer satisfaction and repeat purchases, requiring immediate management action.

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

Solution Query & Output:

```
SELECT
o.quarter_number,
SUM(o.quantity * (o.vehicle_price - (o.vehicle_price * discount))) AS net_revenue,
LAG(SUM(o.quantity * (o.vehicle_price - (o.vehicle_price * o.discount))))
OVER (ORDER BY o.quarter_number) AS prev_quarter_revenue,
ROUND(
(
(SUM(o.quantity * (o.vehicle_price - (o.vehicle_price * o.discount))) -
LAG(SUM(o.quantity * (o.vehicle_price - (o.vehicle_price * o.discount))))
OVER (ORDER BY o.quarter_number))
/ LAG(SUM(o.quantity * (o.vehicle_price - (o.vehicle_price * o.discount))))
OVER (ORDER BY o.quarter_number)
) * 100, 2
) AS qoq_per_change
FROM order_t o
GROUP BY o.quarter_number
ORDER BY o.quarter_number;
```



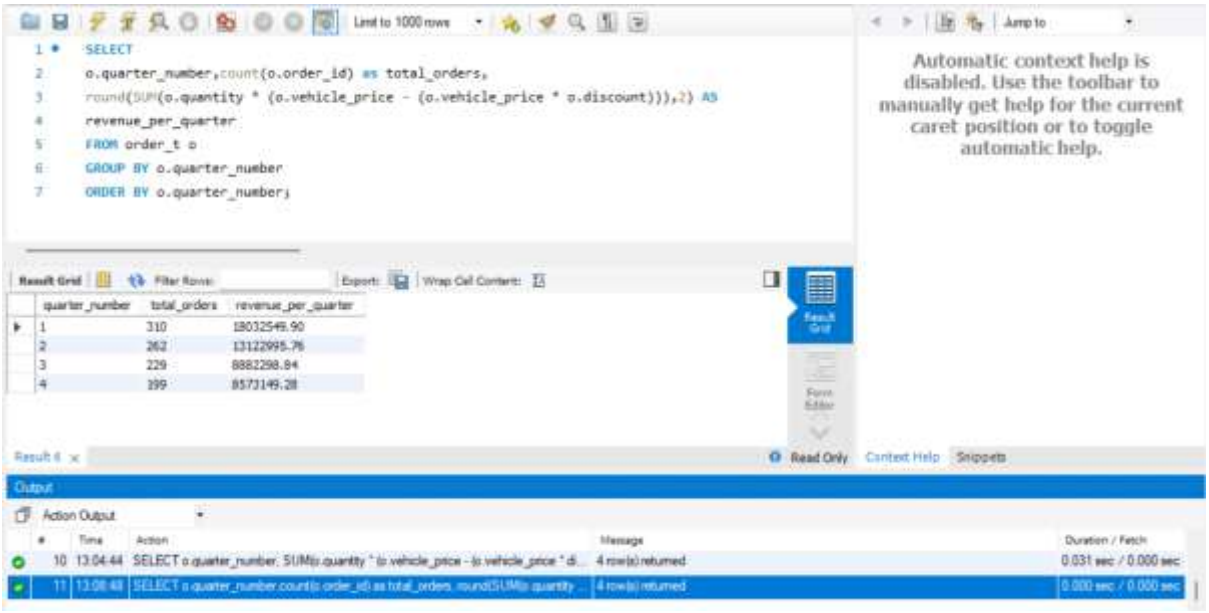
Observation & Insights:

- **Quarter 1** generated the highest revenue, indicating a strong start to the year.
- **Quarter 2** experienced a ~27% decline, signaling the beginning of a downward trend.
- **Quarter 3** recorded the steepest drop (~32%), reflecting reduced sales and weaker customer engagement.
- **Quarter 4** showed only a marginal decline (~3%), suggesting the slowdown stabilized but did not recover.
- Overall, the consistent fall in revenue aligns with declining order volumes and customer satisfaction observed earlier.

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

Solution Query & Output:

```
SELECT
o.quarter_number,count(o.order_id) as total_orders,
round(SUM(o.quantity * (o.vehicle_price - (o.vehicle_price * o.discount))),2) AS
revenue_per_quarter
FROM order_t o
GROUP BY o.quarter_number
ORDER BY o.quarter_number;
```



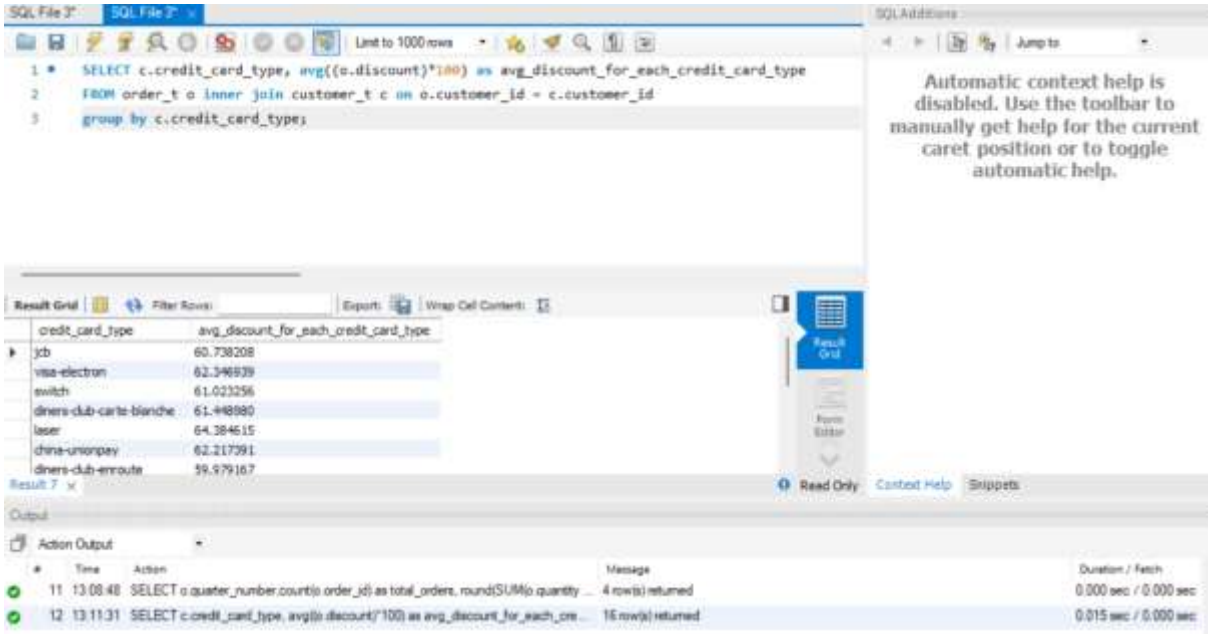
Observation & Insights:

- Both **order volume and net revenue declined consistently across quarters**, indicating a steady slowdown in business performance.
- **Quarter 1** delivered the strongest results, with **310 orders generating ₹18.03M** in revenue.
- **Quarter 4** recorded the weakest performance, with only **199 orders and ₹8.57M** in revenue.
- The sustained decline suggests reduced customer demand and engagement over time.

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

Solution Query & Output:

```
SELECT c.credit_card_type, avg((o.discount)*100) as
avg_discount_for_each_credit_card_type
FROM order_t o inner join customer_t c on o.customer_id = c.customer_id
group by c.credit_card_type;
```



Observation & Insights:

- The average discount remains relatively stable across all credit card types, ranging between **58% and 63%**.
- **Visa Electron, Mastercard, and China UnionPay** customers receive slightly higher average discounts compared to other cardholders.
- **Diners Club International and Solo** show the lowest average discount levels, at around **58%**.
- Overall, discount variations are minimal, indicating a largely consistent pricing strategy across payment methods.

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

Solution Query & Output:

```
SELECT
o.quarter_number,
ROUND(AVG(DATEDIFF(o.ship_date, o.order_date)), 2) AS avg_shipping_days
FROM order_t o
GROUP BY o.quarter_number
ORDER BY o.quarter_number;
```

Observation & Insights:

- The **average shipping time increased consistently across quarters**, indicating progressively slower deliveries over time.
- **Quarter 1** recorded the fastest delivery performance at approximately **57 days**, whereas **Quarter 4** experienced the longest delays at around **174 days**.
- This upward trend suggests inefficiencies in logistics or order processing.
- The company should review and optimize its shipping operations to enhance delivery speed and overall customer experience

BUSINESS METRICS:

Total Revenue	Total Orders	Total Customers	Average Rating
48610993.78	1000	994	3
Last Quarter Revenue	**Last quarter Orders**	**Average Days to Ship**	**% Good Feedback**
8573149.28	199	97.96	21.5

BUSINESS RECOMMENDATIONS:

- Customer satisfaction requires immediate attention, with an average rating of only **3.0** and just **21.5% of customers providing positive ("Good") feedback**.
- **Shipping delays remain high (≈98 days)**, negatively impacting customer experience; optimizing logistics and delivery processes is critical.
- The sharp decline in **orders and revenue in the last quarter** signals weakening demand and reduced customer engagement.
- Analyzing customer feedback can help identify key pain points and enable targeted service improvements.
- Introducing **loyalty programs, personalized offers, and discounts** can improve retention and encourage repeat purchases.
- Overall, enhancing delivery efficiency, customer experience, and promotional strategies will be essential to drive future growth and restore sales momentum.