

NEW WHEELS PROJECT

SQL Business Insights

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Submitted to - Great Learning



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 preowned 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.

Data Description

The data provided has

- Attributes on the vehicles New-Wheels sells What are the make, model, and year? What is the price point?
- Attributes on the customers, such as where they live and payment methods
- Attributes on orders and shipments, such as when the order was shipped and received, what the after-sales feedback was, and so on.

Business Questions

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

Solution:

SELECT

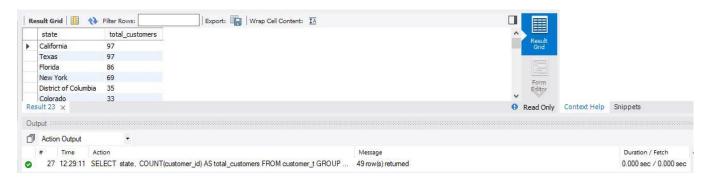
state,

COUNT(customer_id) AS total_customers

FROM customer_t

GROUP BY 1

ORDER BY 2 DESC;



Observation

- Most customers reside in California, Texas, Florida, New York and the District of Columbia
- California and Texas have the highest total customers (97)

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

Solution:

SELECT

vehicle_maker AS top_vehicle_makers,

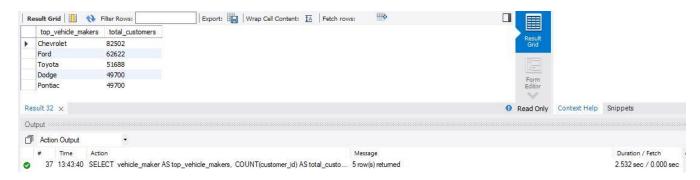
COUNT(customer_id) AS total_customers

FROM product_t JOIN customer_t

GROUP BY top_vehicle_makers

ORDER BY total customers DESC

LIMIT 5;



Observation

- Top 5 vehicle makers preferred by customers are Chevrolet, Ford, Toyota, Dodge and Pontiac
- Most preferred vehicle maker is Chevrolet

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

```
Solution:
SELECT*
FROM
(
      SELECT
            state,
            vehicle_maker,
            COUNT(customer_id) AS total_customers,
 RANK() OVER (PARTITION BY state ORDER BY COUNT(customer_id) DESC) AS ranking
 FROM product_t
 JOIN order_t USING(product_id)
 JOIN customer_t USING(customer_id)
      GROUP BY 1, 2
) AS preferred_vehicle
WHERE ranking = 1
ORDER BY 3 DESC;
```



Observation

- The most preferred vehicle make in each state is Chevrolet
- California and Texas have the Highest customers

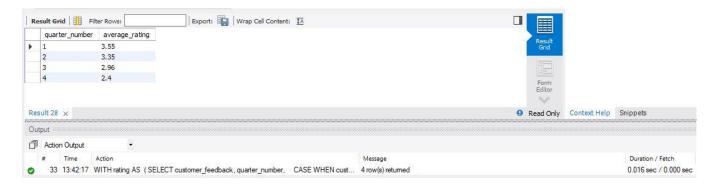
Question 4: Find the overall average rating given by the customers. What is the average rating in each quarter?

```
Solution:
WITH rating AS
      SELECT
             customer_feedback,
             quarter_number,
 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 total_rating
 FROM order_t
)
 SELECT
             quarter_number,
 ROUND(AVG(total_rating), 2) AS average_rating
```

FROM rating

GROUP BY 1

ORDER BY 1 ASC;



Observation

- Negative trend of customer ratings
- -1.15 customer rating decrease from Q1 to Q4
- Recent Q4 customer ratings are in the 'bad' range

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

Solution:

```
WITH cust_feed AS
(
SELECT
quarter_number,
```

ROUND(SUM(CASE WHEN customer_feedback = 'very good' THEN 1 ELSE 0 END), 2) AS very_good,

ROUND(SUM(CASE WHEN customer_feedback = 'good' THEN 1 ELSE 0 END), 2) AS good,

ROUND(SUM(CASE WHEN customer_feedback = 'okay' THEN 1 ELSE 0 END), 2) AS okay,

ROUND(SUM(CASE WHEN customer_feedback = 'bad' THEN 1 ELSE 0 END), 2) AS bad,

ROUND(SUM(CASE WHEN customer_feedback = 'very bad' THEN 1 ELSE 0 END), 2) AS very_bad,

```
ROUND(COUNT(customer_feedback), 2) AS total_feedback
FROM order_t
GROUP BY 1

ORDER BY 1 ASC
)

SELECT

quarter_number,

ROUND((very_good/total_feedback), 2) AS very_good,

ROUND((good/total_feedback), 2) AS good,

ROUND((okay/total_feedback), 2) AS okay,

ROUND((bad/total_feedback), 2) AS bad,

ROUND((very_bad/total_feedback), 2) AS very_bad

FROM cust_feed

GROUP BY 1
```

ORDER BY 1 ASC;



Observation

- Declining trend
- Q1 to Q4 reveals -20% in very good ratings, -19% in good ratings, +1% in okay ratings, +18% in bad ratings, and +20% in very bad ratings

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

Solution:

SELECT

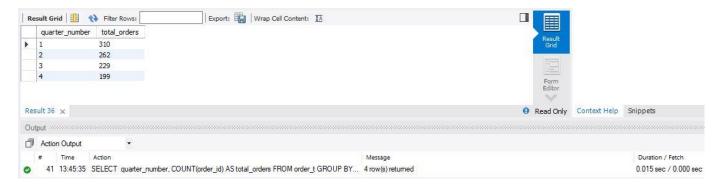
quarter_number,

COUNT(order_id) AS total_orders

FROM order t

GROUP BY 1

ORDER BY 1;



Observation

- Consistent declining trend of total orders
- -111 decrease of total orders from Q1 to Q4 comparatively

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

Solution:

```
WITH QoQ AS
(
SELECT quarter_number,
```

ROUND(SUM(quantity * (vehicle_price - ((discount/100)*vehicle_price))), 0) AS revenue

FROM order_t

GROUP BY quarter_number)

SELECT quarter_number, revenue,

ROUND(LAG(revenue) OVER(ORDER BY quarter_number), 2) AS previous_revenue,

ROUND((revenue - LAG(revenue) OVER(ORDER BY quarter_number))/LAG(revenue) OVER(ORDER BY quarter_number), 2) AS qoq_perc_change

FROM QoQ;



Observation

- Decline in the change in revenue when comparing subsequent to previous quarters
- Decrease in revenue -17%, -11% and -20% per quarter

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

Solution:

SELECT

quarter_number,

ROUND(SUM(quantity*vehicle_price), 0) AS revenue,

COUNT(order_id) AS total_order

FROM order_t

GROUP BY 1

ORDER BY 1;



Observation

- Declining trend of revenue and total orders
- -59% in revenue from Q1 to Q4
- -64% in total orders from Q1 to Q4

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

Solution:

SELECT

credit_card_type,

ROUND(AVG(discount), 2) AS average_discount

FROM order_t t1

INNER JOIN customer_t t2

ON t1.customer_id = t2.customer_id

GROUP BY 1

ORDER BY 2 DESC;



Observation

- Average discount for credit card types range from 58% to 64%
- Lowest discount is Diners Club International(58%)
- Highest discount is Laser(64%)

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

Solution:

SELECT

quarter_number,

ROUND(AVG(DATEDIFF(ship_date, order_date)), 0) AS average_shipping_time

FROM order_t

GROUP BY 1

ORDER BY 1;



Observation

- Consistent delay in the average shipping time from Q1 to Q4 totaling to 117 more days
- Average days to ship increase by 33% from Q1 to Q4

Business Metrics Overview

Total Revenue	Total Orders	Total Customers	Average Rating
125.4M	1000	994	2.6
Last Quarter Revenue	Last quarter Orders	Average Days to Ship	% Good Feedback
23.5M	199	97.97	21.5%

III Observations & Insights

Metric	Value	Insight	
Total Revenue	125.4M	Strong overall revenue, indicating healthy demand.	
Total Orders	1,000	Good order volume; consistent customer activity.	
Total Customers	994	Almost 1 customer per order—implies mostly unique customer transactions.	
Average Rating	2.6/5	Below average — indicates customer dissatisfaction.	
Last Quarter Revenue	23.5M	Q4 accounts for ~18.7% of total revenue → potential for Q4 growth.	

Metric	Value	Insight
Last Quarter Orders	199	Q4 orders are 19.9% of total — consistent with revenue contribution.
Average Days to Ship	97.97 days	Extremely high — major operational bottleneck.
% Good Feedback	< 21.5%	Very low — likely linked to poor shipping speed or service.

Insights Summary

- **Customer satisfaction is a red flag**: Low rating (2.6) and only 21.5% good feedback suggest issues in product quality, delivery time, or service.
- Shipping delays are critical: ~98 days to ship is well beyond acceptable standards and is likely causing negative feedback.
- Revenue is not seasonal yet: Q4 performance (~19%) aligns with an even quarterly split. No spike in sales—missed seasonal growth?
- **Wide customer base**: Nearly 1:1 ratio of customers to orders indicates low repeat purchasing behavior.

Business Recommendations

1. // Improve Logistics & Fulfillment

- o Investigate shipping delays a 98-day average is unacceptable.
- Partner with faster logistics providers or reevaluate fulfillment strategy.

2. Address Customer Service Issues

- o Actively collect detailed feedback on negative experiences.
- o Prioritize post-sale support and offer resolutions to unhappy customers.

3. Boost Customer Retention

- o Introduce loyalty programs or discounts for repeat buyers.
- Promote cross-selling and upselling strategies.

4. Optimize Q4 Campaigns

 Q4 revenue isn't showing holiday uplift — plan better promotions or bundles. o Analyze competitors' seasonal strategies.

5. Raise Product Ratings

- o Identify underperforming products using feedback.
- $\circ\quad$ Improve product quality and set realistic customer expectations.

6. Monitor KPIs Quarterly

- Break down revenue, ratings, and shipping time by quarter to track progress.
- o Focus on trending improvements in upcoming quarters.