

# New Wheels Project

## Introduction to SQL

### Problem Statement

#### Project Overview

This project analyzes one year of data from New Wheels, a resale vehicle company offering end-to-end service through its digital platform. Using SQL and business analytics, the goal is to identify trends in revenue, customer satisfaction, and shipping performance to support leadership in diagnosing challenges and making data-informed decisions.

#### 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.

**Q1: Find the total number of customers who have placed orders. What is the distribution of the customers across states?**

**Solution Query:**

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

**Output:**

Result: Passed

Query 1

Query:

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

Output:

Showing first 10 rows out of 49 rows

customer_state	total_customers
Texas	97
California	97
Florida	86
New York	69
District of Columbia	35
Ohio	33

## Observations and Insights:

### *Customer Distribution by State*

- **Customer concentration is highest in major states:** Texas and California tie for the largest customer base (97 each), with Florida (86) and New York (69) following closely.
- **A sharp drop appears after the top four states:** The next tier, including the District of Columbia (35), Ohio (33), and Colorado (33), reflects significantly smaller customer pools compared to the leaders.
- **Wide state coverage, but uneven distribution:** Customers are spread across 49 states, yet the majority are clustered in a handful of key markets.
- **Imbalance in scale:** The disparity between leading and lower-tier states suggests that overall sales performance is currently driven by a small set of geographic areas.

## Q2: Which are the top 5 vehicle makers preferred by the customers?

### Solution Query:

```
SELECT
    vehicle_maker,
    COUNT(DISTINCT o.customer_id) AS
customer_count
FROM
    order_t as o
    JOIN product_t as p
        ON o.product_id = p.product_id
GROUP BY
    vehicle_maker
ORDER BY
    customer_count DESC
LIMIT 5;
```

### Output:

Result: Passed

Query 1

Query:

```
SELECT
    vehicle_maker,
    COUNT(DISTINCT o.customer_id) AS customer_count
FROM
    order_t as o
    JOIN product_t as p
        ON o.product_id = p.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:

### Top 5 Vehicle Makers

- **Chevrolet leads by a wide margin:** With 83 unique customers, Chevrolet is the most preferred maker among New Wheels customers, outpacing Ford (63) and Toyota (52).
- **Domestic brands dominate:** Four of the top five makers — Chevrolet, Ford, Pontiac, and Dodge — are American, suggesting New Wheels' customers show stronger preference for domestic vehicles.
- **Compact competition among 3rd–5th place:** Toyota (52), Pontiac (50), and Dodge (50) are nearly tied, indicating more balanced competition in the mid-tier of customer preference.
- **Limited diversity among top makers:** The list is heavily weighted toward traditional mass-market brands, pointing to a narrower spread of customer loyalty and potentially less penetration into premium or niche makers.

### Q3: Which is the most preferred vehicle maker in each state?

#### Solution Query:

```
SELECT
    state,
    vehicle_maker,
    maker_rank,
    customer_count
FROM (
    SELECT
        c.state as state,
        p.vehicle_maker as 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 maker_rank
    FROM
        customer_t as c
        JOIN order_t as o
            ON c.customer_id = o.customer_id
        JOIN product_t as p
            ON o.product_id = p.product_id
    Group By
        c.state,
        p.vehicle_maker
    ) as ranked
WHERE maker_rank = 1
ORDER BY
    state;
```

#### Output:

Result: Passed

Query 1

Query:

```
SELECT
    state,
    vehicle_maker,
    maker_rank,
    customer_count
FROM (
    SELECT
        c.state as state,
        p.vehicle_maker as 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 maker_rank
    FROM
        customer_t as c
        JOIN order_t as o
            ON c.customer_id = o.customer_id
        JOIN product_t as p
            ON o.product_id = p.product_id
    Group By
        c.state,
        p.vehicle_maker
    ) as ranked
WHERE maker_rank = 1
ORDER BY
    state
```

Output:

Showing first 10 rows out of 143 rows

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



## Observations and Insights:

### *Most Preferred Maker in Each State*

- **Domestic brand prominence:** State-level leaders are predominantly legacy U.S. makers (e.g., Chevrolet, Ford, Dodge, Pontiac, Cadillac), consistent with the overall preference landscape from Q2.
- **Fragmented leadership in several states:** Multiple states exhibit ties at rank 1, signaling shared top preference rather than a single dominant maker in those markets.
- **Narrow leadership margins:** Leader counts per state are often small, indicating that a few additional customers can shift the top position; evidence of close competition at the state level.
- **Regional heterogeneity:** The identity of the top-ranked maker varies across states, underscoring that customer preferences are regional and not fully captured by national totals alone.
- **Macro-micro alignment:** Makers that rank highly nationwide also recur as state leaders, suggesting that national strength is built from many localized leadership positions.

## Q4: 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
    'OVERALL' AS rating_scope,
    ROUND(AVG(
        CASE customer_feedback
            WHEN 'Very Bad' THEN 1
            WHEN 'Bad'      THEN 2
            WHEN 'Okay'    THEN 3
            WHEN 'Good'     THEN 4
            WHEN 'Very Good' THEN 5
        END
    ), 2) AS average_rating
FROM order_t

UNION ALL

SELECT
    'Q' || quarter_number AS rating_scope,
    ROUND(AVG(
        CASE customer_feedback
            WHEN 'Very Bad' THEN 1
            WHEN 'Bad'      THEN 2
            WHEN 'Okay'    THEN 3
            WHEN 'Good'     THEN 4
            WHEN 'Very Good' THEN 5
        END
    ), 2) AS average_rating
FROM order_t
GROUP BY quarter_number
ORDER BY rating_scope;
```

### Output:

Result: **Passed**

Query 1

Query:

```
SELECT
    'OVERALL' AS rating_scope,
    ROUND(AVG(
        CASE customer_feedback
            WHEN 'Very Bad' THEN 1
            WHEN 'Bad'      THEN 2
            WHEN 'Okay'    THEN 3
            WHEN 'Good'     THEN 4
            WHEN 'Very Good' THEN 5
        END
    ), 2) AS average_rating
FROM order_t

UNION ALL

SELECT
    'Q' || quarter_number AS rating_scope,
    ROUND(AVG(
        CASE customer_feedback
            WHEN 'Very Bad' THEN 1
            WHEN 'Bad'      THEN 2
            WHEN 'Okay'    THEN 3
            WHEN 'Good'     THEN 4
            WHEN 'Very Good' THEN 5
        END
    ), 2) AS average_rating
FROM order_t
GROUP BY quarter_number
ORDER BY rating_scope
```

Output:

Showing 5 rows

rating_scope	average_rating
OVERALL	3.14
Q1	3.55
Q2	3.35
Q3	2.96
Q4	2.4



## Observations and Insights:

### *Customer Feedback Trends*

- **Moderate overall satisfaction levels:** The average rating across all orders stands at 3.14 out of 5, reflecting a neutral to slightly positive perception of the customer experience.
- **Clear downward trend over time:** Ratings steadily decline from 3.55 in Q1 to 2.40 in Q4, signaling a progressive deterioration in how customers perceive value and service quality.
- **Stronger early-quarter sentiment:** Q1 and Q2 remain above the neutral threshold (3.0), pointing to more favorable customer engagement in the earlier phases of the year.
- **Sharp erosion in Q3 and Q4:** The steepest decline occurs in the second half, suggesting a notable shift in service delivery, fulfillment, or customer support.
- **Growing risk to brand trust:** Sustained deterioration in customer feedback undermines loyalty — a critical threat in a reputation-driven market like vehicle sales.

## Q5: Find the percentage distribution of feedback from the customers. Are customers getting more dissatisfied over time?

### Solution Query:

### Output:

```
SELECT
  scope,
  customer_feedback,
  feedback_percentage
FROM (
  SELECT
    'OVERALL' AS scope,
    customer_feedback,
    ROUND(COUNT(*) * 100.0 / (SELECT
COUNT(*) FROM order_t), 2) AS
feedback_percentage,
    CASE customer_feedback
      WHEN 'Very Good' THEN 1
      WHEN 'Good' THEN 2
      WHEN 'Okay' THEN 3
      WHEN 'Bad' THEN 4
      WHEN 'Very Bad' THEN 5
    END AS feedback_sort
  FROM order_t
  GROUP BY customer_feedback

  UNION ALL

  SELECT
    'Q' || quarter_number AS scope,
    customer_feedback,
    ROUND(COUNT(*) * 100.0 /
      (SELECT COUNT(*) FROM order_t
WHERE quarter_number = o.quarter_number),
2) AS feedback_percentage,
    CASE customer_feedback
      WHEN 'Very Good' THEN 1
      WHEN 'Good' THEN 2
      WHEN 'Okay' THEN 3
      WHEN 'Bad' THEN 4
      WHEN 'Very Bad' THEN 5
    END AS feedback_sort
  FROM order_t AS o
  GROUP BY quarter_number,
customer_feedback
)
ORDER BY feedback_sort, scope;
```

Result: **Passed**

Query 1

Query:

```
SELECT
  scope,
  customer_feedback,
  feedback_percentage
FROM (
  SELECT
    'OVERALL' AS scope,
    customer_feedback,
    ROUND(COUNT(*) * 100.0 / (SELECT COUNT(*) FROM order_t), 2) AS feedback_percentage,
    CASE customer_feedback
      WHEN 'Very Good' THEN 1
      WHEN 'Good' THEN 2
      WHEN 'Okay' THEN 3
      WHEN 'Bad' THEN 4
      WHEN 'Very Bad' THEN 5
    END AS feedback_sort
  FROM order_t
  GROUP BY customer_feedback

  UNION ALL

  SELECT
    'Q' || quarter_number AS scope,
    customer_feedback,
    ROUND(COUNT(*) * 100.0 /
      (SELECT COUNT(*) FROM order_t WHERE quarter_number = o.quarter_number), 2) AS feedback_percentage,
    CASE customer_feedback
      WHEN 'Very Good' THEN 1
      WHEN 'Good' THEN 2
      WHEN 'Okay' THEN 3
      WHEN 'Bad' THEN 4
      WHEN 'Very Bad' THEN 5
    END AS feedback_sort
  FROM order_t AS o
  GROUP BY quarter_number, customer_feedback
)
ORDER BY feedback_sort, scope
```

Output:

Showing first 10 rows out of 25 rows

scope	customer_feedback	feedback_percentage
OVERALL	Very Good	22.6
Q1	Very Good	30
Q2	Very Good	28.63
Q3	Very Good	16.59
Q4	Very Good	10.05
OVERALL	Good	21.5
Q1	Good	28.71
Q2	Good	22.14
Q3	Good	20.96
Q4	Good	10.05





## Observations and Insights:

### *Feedback Distribution*

- **Positive feedback dominates early:** In Q1, Very Good (30%) and Good (28.71%) together account for nearly 60% of feedback, reflecting strong initial customer sentiment.
- **Gradual erosion of positive ratings:** By Q4, Very Good falls to 10.05% and Good drops to 10.05%, indicating a sharp reduction in positive experiences compared to earlier quarters.
- **Overall distribution skews balanced:** Across all orders, feedback percentages are spread fairly evenly (Very Good 22.6%, Good 21.5%, Okay 20.2%, Bad 18.2%, Very Bad 17.5%), suggesting that the company does not have an overwhelming tilt toward either satisfaction or dissatisfaction when averaged out.
- **Downward trend in satisfaction over time:** The trajectory from Q1 to Q4 shows positive feedback shrinking quarter-by-quarter, a pattern consistent with weakening customer perception as the year progressed.

## Q6: What is the trend of the number of orders by quarter?

### Solution Query:

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

### Output:

Result: Passed

#### ✓ Query 1

#### Query:

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

#### Output:

Showing 4 rows

quarter_number	total_orders
1	310
2	262
3	229
4	199



## Observations and Insights:

### *Trends of Orders by Quarter*

- **Strongest demand in Q1:** The year opened with the highest order volume (310 orders), setting the peak baseline for performance.
- **Consistent quarter-over-quarter decline:** Orders fell to 262 in Q2, 229 in Q3, and 199 in Q4, showing a steady downward trajectory.
- **Sustained loss of momentum:** By Q4, order volume had dropped by more than one-third from Q1, underscoring a persistent weakening in customer purchasing behavior across the year.

## Follow-Up: What is the trend of the number of vehicles sold by quarter?

### Solution Query:

```
SELECT
    quarter_number AS quarter,
    SUM(quantity) AS total_units_sold
FROM
    order_t
GROUP BY
    quarter_number
ORDER BY
    quarter_number;
```

### Output:

Result: **Passed**

✓ Query 1

Query:

```
SELECT
    quarter_number AS quarter,
    SUM(quantity) AS total_units_sold
FROM
    order_t
GROUP BY
    quarter_number
ORDER BY
    quarter_number
```

Output:

Showing 4 rows

quarter	total_units_sold
1	464
2	400
3	342
4	306



## Observations and Insights:

### *Trends of Vehicles Sold by Quarter*

- **Highest volume in Quarter 1:** Vehicle sales began strongly with 464 units sold in Quarter 1, marking the highest quarterly total for the period and aligning with the order peak seen in the same quarter.
- **Clear quarter-over-quarter decline:** Units sold decreased steadily over the next three quarters – to 400 in Q2, 342 in Q3, and 306 in Q4 – reflecting a persistent downtrend in total volume.
- **Matching trajectory with order count:** The decline in vehicles sold closely parallels the drop in order volume observed in Q6. This suggests that reduced sales activity was driven by fewer transactions rather than changes in order composition.
- **No reversal or stabilization in later quarters:** There was no sign of leveling off or rebound by Quarter 4. Instead, each quarter recorded a progressively lower number of units sold, pointing to a sustained pullback in customer purchasing over time.

## Q7: Calculate the net revenue generated by the company. What is the quarter-over-quarter % change in net revenue?

### Solution Query

```
SELECT
    quarter_number,
    ROUND(net_revenue, 2) AS
net_revenue,
    ROUND(
        CASE
            WHEN LAG(net_revenue)
OVER (ORDER BY quarter_number) IS
NULL THEN NULL
            ELSE
                ((net_revenue -
LAG(net_revenue) OVER (ORDER BY
quarter_number))
                /
LAG(net_revenue) OVER (ORDER BY
quarter_number)) * 100
            END, 2
        ) AS qoq_percent_change
FROM (
    SELECT
        quarter_number,
        SUM(vehicle_price *
quantity * (1 - discount /
100.0)) AS net_revenue
        FROM order_t
        GROUP BY quarter_number
    )
ORDER BY quarter_number;
```

### Output:

Result: **Passed**

Query 1

Query:

```
SELECT
    quarter_number,
    ROUND(net_revenue, 2) AS net_revenue,
    ROUND(
        CASE
            WHEN LAG(net_revenue) OVER (ORDER BY quarter_number) IS NULL THEN NULL
            ELSE
                ((net_revenue - LAG(net_revenue) OVER (ORDER BY quarter_number))
                / LAG(net_revenue) OVER (ORDER BY quarter_number)) * 100
            END, 2
        ) AS qoq_percent_change
FROM (
    SELECT
        quarter_number,
        SUM(vehicle_price * quantity * (1 - discount / 100.0)) AS net_revenue
        FROM order_t
        GROUP BY quarter_number
    )
ORDER BY quarter_number
```

Output:

Showing 4 rows

quarter_number	net_revenue	qoq_percent_change
1	39421580.16	
2	32715830.34	-17.01
3	29229896.19	-10.66
4	23346779.63	-20.13



## Observations and Insights:

### *Net Revenue and QoQ Change*

- **Strongest revenue performance occurred in Quarter 1:** Net revenue peaked at \$39.4M in Quarter 1, establishing the year's high point and setting a baseline for subsequent quarters.
- **Steepest single-quarter drop came at the end of the year:** Quarter 4 saw the most dramatic decline, with revenue falling over 20% from the previous quarter — the largest negative shift of the year.
- **Revenue declined consistently across all quarters:** Each successive quarter showed a negative percentage change: -17.01%, -10.66%, and -20.13%, indicating a persistent contraction in sales revenue with no sign of rebound.
- **Mid-year moderation followed by sharp erosion:** The revenue drop from Q2 to Q3 was comparatively modest, but this was followed by a sharper downturn in Q4, suggesting a second wave of market softening late in the year.
- **Revenue trends align with volume-based declines:** The downward trend in revenue mirrors the declines observed in both orders and vehicles sold across quarters, indicating that the revenue loss is volume-driven rather than price-driven.

## Q8: What is the trend of net revenue and orders by quarters?

### Solution Query:

```
SELECT
    quarter_number,
    ROUND(SUM(vehicle_price * quantity * (1
- discount / 100.0)), 2) AS net_revenue,
    COUNT(order_id) AS total_orders
FROM order_t
GROUP BY quarter_number
ORDER BY quarter_number;
```

### Output:

Result: Passed

✓ Query 1

Query:

```
SELECT
    quarter_number,
    ROUND(SUM(vehicle_price * quantity * (1 - discount / 100.0)), 2) AS net_revenue,
    COUNT(order_id) AS total_orders
FROM order_t
GROUP BY quarter_number
ORDER BY quarter_number
```

Output:

Showing 4 rows

quarter_number	net_revenue	total_orders
1	39421580.16	310
2	32715830.34	262
3	29229896.19	229
4	23346779.63	199

## Observations and Insights:

### Net Revenue and Orders by Quarter

- **Q1 marked the peak in both revenue and order volume:** With 310 orders and over \$39.4M in net revenue, Quarter 1 was the company's strongest performing period, serving as the high-water mark for the year.
- **Sustained quarter-over-quarter decline in both metrics:** From Q1 to Q4, total orders fell by more than one-third (310 → 199), while net revenue declined by over \$16M, reflecting consistent erosion in both transaction volume and monetary value.
- **Revenue drop closely parallels order volume decline:** The similar downward slope in both order count and revenue suggests the revenue loss is primarily driven by fewer transactions rather than changes in pricing strategy or discounting behavior.
- **Demand contraction intensified late in the year:** Although revenue loss was steepest in Q2, the continued decline into Q4 – with revenue dipping below \$24M and orders below 200 – signals a deeper slowdown that persisted through year-end.

## Q9: What is the average discount offered for different types of credit cards?

### Solution Query:

```
SELECT
    c.credit_card_type,
    ROUND(AVG(o.discount), 2) AS average_discount
FROM order_t as o
JOIN customer_t as c
    ON o.customer_id = c.customer_id
GROUP BY c.credit_card_type
ORDER BY average_discount DESC;
```

### Output:

Result: **Passed**

✓ Query 1

Query:

```
SELECT
    c.credit_card_type,
    ROUND(AVG(o.discount), 2) AS average_discount
FROM order_t as o
JOIN customer_t as c
    ON o.customer_id = c.customer_id
GROUP BY c.credit_card_type
ORDER BY average_discount DESC
```

Output:

Showing first 10 rows out of 16 rows

credit_card_type	average_discount
laser	0.64
mastercard	0.63
visa-electron	0.62
maestro	0.62
instapayment	0.62
china-unionpay	0.62
americanexpress	0.62
switch	0.61
jcb	0.61
diners-club-us-ca	0.61





## Observations and Insights:

### *Average Discount by Credit Card Type*

- **Laser cardholders received the highest average discounts:** Laser topped the list with an average discount of 0.64%, slightly ahead of more common cards like Mastercard (0.63%) and Visa Electron (0.62%).
- **Discounting was present but modest, averaging 0.61% across card types.** There's no evidence that discounts were used aggressively to drive sales; most discounts remained minimal and consistent.
- **Discounts were closely clustered across card types:** Despite 16 credit card types in use, average discounts ranged narrowly from 0.58% to 0.64%, reflecting a tightly managed pricing strategy rather than card-specific promotional tactics.

## Q10: What is the average time taken to ship the placed orders for each quarter?

### Solution Query:

```
SELECT
    quarter_number,
    ROUND(AVG(julianday(ship_date) -
julianday(order_date)), 2) AS
avg_shipping_days
FROM order_t
GROUP BY quarter_number
ORDER BY quarter_number;
```

### Output:

Result: Passed

#### Query 1

#### Query:

```
SELECT
    quarter_number,
    ROUND(AVG(julianday(ship_date) - julianday(order_date)), 2) AS avg_shipping_days
FROM order_t
GROUP BY quarter_number
ORDER BY quarter_number
```

#### Output:

Showing 4 rows

quarter_number	avg_shipping_days
1	57.17
2	71.11
3	117.76
4	174.1

## Observations and Insights:

### *Trend of Shipping Times by Quarter*

- **Shipping time increased significantly each quarter:** The average shipping duration rose steadily from 57.17 days in Q1 to 174.1 days in Q4, a ~3× increase over the year.
- **Early-year logistics were comparatively efficient:** Q1's lower shipping average suggests the fulfillment process began the year under control—either due to stronger operations, leaner order volumes, or faster supply chain turnaround.
- **Q3 marks a sharp inflection point:** The jump from 71.11 days (Q2) to 117.76 days (Q3) represents a 65% increase in average shipping time, indicating that constraints became more acute midway through the year.
- **Q4 delays may have compounded customer experience challenges:** With shipping times peaking at 174.1 days, customers ordering in Q4 likely waited nearly 6 months on average for delivery. This may have contributed to the drop in order volume and net revenue seen in previous analyses (Q6–Q8).

Total Revenue	Total Orders	Total Vehicles Sold	Total Customers	Average Rating
\$124,714,086.32	1,000	1,512	994	3.14
Last Quarter Revenue	Last Quarter Orders Total	Average Discount per Vehicle	Average Days to Ship	% Good Feedback (inc. Very Good)
\$23,346,779.63	199	0.61%	97.96	44.1%

## Observations and Insights

### Key Metrics Overview by Category

- **Sales Volume & Revenue:** Sales performance showed consistent quarterly decline, with total revenue reaching ~\$125M across 1,000 orders. The final quarter contributed just \$23.3M from 199 orders, reinforcing a downward momentum in customer activity.
- **Product Movement (Units Sold & Discounts):** Vehicle movement averaged 1.5 units per order, totaling 1,512 units sold. The average discount of 0.61% per vehicle was minimal, suggesting limited price-based incentives were used throughout the year.
- **Customer Base & Sentiment:** Customer volume reached 994, yet only 44.1% rated their experience as “Good” or “Very Good.” This gap between purchase behavior and satisfaction indicates potential issues in the post-sale experience or service delivery.
- **Fulfillment Efficiency:** Average shipping time reached nearly 98 days, increasing steadily each quarter. Extended fulfillment timelines may have contributed to lower customer satisfaction and could be influencing repeat purchase behavior.

New Wheels has experienced a sustained year-long decline in resale vehicle sales, accompanied by a downturn in customer sentiment that is constraining new customer acquisition. This analysis leverages transactional and feedback data from the past four quarters to uncover performance trends, diagnose core business challenges, and deliver data-driven insights to inform strategic decisions at the executive level.

## Key Findings

- Customer preferences are brand-loyal but regionally distinct. While Chevrolet and Ford dominated nationally, state-level variations highlight the need for regionally tuned inventory strategies.
- Quarterly order volume declined steadily, with Q1 posting the highest (310 orders) and Q4 the lowest (199 orders), indicating an erosion of demand over the year.
- Customer sentiment weakened as the year progressed. “Good” and “Very Good” feedback declined, while “Bad” and “Very Bad” responses increased. The average rating dropped to 3.14 by year-end, down from 3.55 in Q1.
- Shipping delays worsened each quarter. The average number of days to ship grew from 57.17 days in Q1 to 174.1 days in Q4, suggesting operational bottlenecks significantly impacted customer satisfaction.
- Revenue declined each quarter, but at varying rates—moderate in Q2/Q3 and steepest in Q4. While Q1 saw the highest revenue (~\$39.4M), Q4 fell to ~\$23.35M. Quarter-over-quarter changes were sharp: Q2 down -17.01%, Q3 down -10.66%, and Q4 down -20.13%—reflecting both declining order volume and possible inefficiencies.
- Discounting was present but modest, averaging 0.61% per vehicle across card types. There's no evidence of broad discounting being used to prop up sales.

## Business Recommendations

### 1. Cut Ship Times in Half

Shipping delays are the single most damaging factor affecting revenue and sentiment. A focused operations sprint should target bringing the average ship time below 50 days, with an SLA on 95th percentile fulfillment.

### 2. Rebuild Trust During the Wait

Launch proactive order updates and introduce a “Delay Credit” policy to improve perception and manage dissatisfaction. The customer doesn't need perfection—but they do need visibility.

### 3. Focus Growth Where It's Working

Double down on core markets—Texas, California, Florida, and New York—and stock the most preferred vehicle brands ready to ship. Target these campaigns with a clear promise: fast delivery, trusted brands.

### 4. Track What Matters

Build a QBR-style dashboard showing revenue, orders, shipping time, and customer sentiment by quarter and region. Add two lead indicators: backlog age and 95th percentile ship time. Use this to monitor recovery.