Danny's Diner SQL Case Study

Complete Analysis Report

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1. Project Overview

This case study is a part of the 8 Week SQL Challenge by Danny Ma, focusing on customer behavior analysis at Danny's Diner, a fictional Japanese restaurant. The project demonstrates advanced SQL techniques including window functions, CTEs, joins, and aggregations to extract meaningful business insights from transactional data. The analysis covers customer ordering patterns, loyalty program effectiveness, and strategic recommendations for business growth.

Tools & Concepts Used:

SQL Features	Window Functions, CTEs, Joins, Aggregations
Analysis Types	Customer segmentation, Time-based filtering
Business Focus	Reward logic modeling, Customer behavior analysis
Output	storytelling & business insights

2.Dataset Description

The analysis is based on three interconnected datasets that capture the complete customer journey from ordering to membership enrollment.

Table	Columns	Description	Sample Data
sales	customer_id, order_date, product_id	Customer order transactions	('A', '2021-01-01', 1)
menu	product_id, product_name, price	Product catalog with pricing	(1, 'sushi', 10)
Members	customer_id, join_date	Membership enrollment dates	('A', '2021-01-07')

3. Case Study Questions & Solutions

Q1: What is the total amount each customer spent at the restaurant?

This query calculates the total spending for each customer by joining sales and menu tables.

```
SELECT s.customer_id, SUM(m.price) AS total_spent FROM sales s
JOIN menu m
ON s.product_id = m.product_id GROUP BY s.customer_id ORDER BY
s.customer_id;
```

Customer ID	Total Spent
A	$76
B	$74
C	$36

Q2: How many days has each customer visited the restaurant?

This query counts distinct visit days for each customer.

```
SELECT customer_id, COUNT(DISTINCT order_date) AS visit_count
FROM sales
GROUP BY customer_id ORDER BY customer_id;
```

Customer ID	Visit Count
A	4 days
B	6 days
C	2 days

Q3: What was the first item purchased by each customer?

Uses window functions to rank orders by date and find the first purchase.

```
WITH ranked AS ( SELECT *, RANK() OVER (PARTITION BY customer_id
ORDER BY
order_date) AS rk FROM sales ) SELECT r.customer_id,
m.product_name FROM
ranked r JOIN menu m ON r.product_id = m.product_id WHERE rk = 1
ORDER BY
r.customer_id;
```

Customer ID	First Product
A	Sushi
B	Curry
C	Ramen

4. Analysis Results & Insights

The analysis reveals several key patterns in customer behavior and business performance:

Insight Category	Key Finding	Business Impact
Customer Spending	Customer A leads with $76 total spent	Focus retention efforts on high-value customers
Visit Frequency	Customer B visits most (6 days)	Frequency doesn't correlate with total spending
Product Popularity	Ramen is most ordered (8 times)	Prioritize ramen in marketing and inventory
Membership Behavior	2/3 customers became members	Strong conversion rate for loyalty program
Reward Points	Customer B earned most points (940)	Sushi double-points system drives engagement

5. Business Recommendations

Strategy Area	Recommendation	Expected Outcome
Menu Optimization	Focus marketing on ramen dishes	Increase sales of most popular item
Customer Retention	Develop VIP program for high-spenders	Improve customer lifetime value
Membership Growth	Target customers with consistent spending	Increase membership conversion rate
Inventory Management	Ensure ramen availability	Reduce stock outs of popular items
Reward Program	Maintain sushi double-points incentive	Drive premium product sales

6. Technical Implementation

This case study demonstrates advanced SQL techniques including:

SQL	Technique	Usage Example
Window Functions	Ranking and partitioning data	RANK() OVER (PARTITION BY customer_id)
Common Table Expressions	Breaking complex queries	WITH ranked AS (SELECT ...)
JOINs	Combining related data sales	JOIN menu ON product_id
Aggregations	Summarizing data	SUM(), COUNT(), GROUP BY
CASE Statements	Conditional logic	CASE WHEN product = 'sushi' THEN price*20

7. Conclusion

This Danny's Diner case study successfully demonstrates the power of SQL for business intelligence and customer analytics. Through systematic analysis of transactional data, we've uncovered valuable insights about customer behavior, product performance, and membership effectiveness. Key takeaways include the importance of ramen as a menu staple, the effectiveness of the reward program in driving customer engagement, and the need for targeted retention strategies for high-value customers. The technical implementation showcases advanced SQL concepts including window functions, CTEs, and complex joins, providing a solid foundation for similar analytical projects in real-world business scenarios.

--- End of Report ---

For complete SQL scripts and additional analysis, refer to the project repository.