CODTECH Internship Task - 2: Data Analysis Report

This report is part of Task 2 of the CODTECH Internship program. It contains advanced SQL queries that analyze data using window functions, subqueries, and common table expressions (CTEs).  
The goal is to uncover trends or patterns in the data. The analysis covers sales performance, customer spending habits, and product popularity.

# 1️⃣ Top-Selling Products

Query:

WITH ProductSales AS (  
 SELECT p.product\_name, SUM(s.quantity) AS total\_quantity  
 FROM sales s  
 JOIN products p ON s.product\_id = p.product\_id  
 GROUP BY p.product\_name  
)  
SELECT product\_name, total\_quantity  
FROM ProductSales  
ORDER BY total\_quantity DESC  
LIMIT 5;

Trend/Pattern:

This query identifies the top 5 products with the highest total quantity sold, helping to understand which products are most popular.

# 2️⃣ Top Customers by Spending

Query:

WITH CustomerSpending AS (  
 SELECT c.customer\_name, SUM(s.quantity \* s.price) AS total\_spent  
 FROM sales s  
 JOIN customers c ON s.customer\_id = c.customer\_id  
 GROUP BY c.customer\_name  
)  
SELECT customer\_name, total\_spent  
FROM CustomerSpending  
ORDER BY total\_spent DESC  
LIMIT 5;

Trend/Pattern:

This identifies the top 5 customers by total spending, highlighting loyal and valuable customers.

# 3️⃣ Peak Sales Days

Query:

SELECT sale\_date, SUM(quantity) AS total\_quantity  
FROM sales  
GROUP BY sale\_date  
ORDER BY total\_quantity DESC  
LIMIT 5;

Trend/Pattern:

This highlights the days with the highest sales, indicating potential patterns in demand (like weekdays, weekends, or holidays).

# 4️⃣ Average Order Quantity per Customer

Query:

WITH CustomerOrders AS (  
 SELECT customer\_id, AVG(quantity) AS avg\_quantity  
 FROM sales  
 GROUP BY customer\_id  
)  
SELECT c.customer\_name, co.avg\_quantity  
FROM CustomerOrders co  
JOIN customers c ON co.customer\_id = c.customer\_id  
ORDER BY avg\_quantity DESC;

Trend/Pattern:

This identifies which customers typically place larger orders, useful for marketing and sales strategies.

# 5️⃣ Monthly Sales Trends

Query:

SELECT DATE\_FORMAT(sale\_date, '%Y-%m') AS month, SUM(quantity) AS total\_quantity  
FROM sales  
GROUP BY month  
ORDER BY month;

Trend/Pattern:

This query groups sales by month to reveal seasonal or monthly trends, which can help with forecasting and inventory planning.

# 6️⃣ Customer Order Ranking (Using Window Functions)

Query:

SELECT customer\_id, customer\_name, total\_orders,  
 RANK() OVER (ORDER BY total\_orders DESC) AS order\_rank  
FROM (  
 SELECT c.customer\_id, c.customer\_name, COUNT(\*) AS total\_orders  
 FROM sales s  
 JOIN customers c ON s.customer\_id = c.customer\_id  
 GROUP BY c.customer\_id, c.customer\_name  
) AS CustomerOrderCount;

Trend/Pattern:

This uses a window function to rank customers by total orders, providing a clear picture of the most engaged buyers.

# Conclusion

The above queries provide a comprehensive analysis of key sales and customer metrics. Using CTEs, window functions, and subqueries, we uncovered valuable trends and patterns that can support data-driven decision-making.