**Coffee Shop Sales Analytics - SQL Database Analysis**

**Project Overview**

Welcome to the Coffee Shop Sales Analytics project! This project delves into the world of coffee shop sales, using SQL queries to extract valuable insights from transaction data. With data stored in a coffee\_shop database, we dive into key transaction records—ranging from sales amounts, product details, and store locations to transaction IDs, date, and time. The objective? To uncover meaningful insights that can drive business decisions, optimize sales, and improve performance.

**Technologies Used:**

* SQL

**Project Objectives**

The goal of this project was to dive deep into the sales data to uncover patterns and actionable insights that can help improve business operations. Here’s what I set out to achieve:

1. **Calculate Total Sales** for specific time periods (e.g., monthly), to evaluate the coffee shop's financial performance.
2. **Track MoM (Month-over-Month) Growth** for sales, orders, and quantities to monitor business trends.
3. **Analyze Sales by Store Location** to discover top-performing stores and regional differences.
4. **Break Down Sales by Product Category and Type** to see which products bring in the most revenue.
5. **Understand Hourly and Daily Sales Trends** to optimize staffing and inventory management based on peak hours and days.
6. **Spot Anomalies** by comparing daily sales to average figures and identifying unusually high or low-performing days.

**Key Insights and Achievements**

Throughout this project, I learned a great deal and uncovered valuable insights:

* **MoM Growth Analysis:**  
  I got hands-on experience using SQL’s LAG() window function to calculate Month-over-Month growth in sales, quantities, and orders. It was fascinating to see how business performance changes over time and what trends emerged.
* **Sales Distribution:**  
  By analyzing how sales are distributed across different stores and product categories, I gained a clear understanding of which locations and products are the true revenue drivers.
* **Time-Based Trends:**  
  I enhanced my skills in analyzing how sales fluctuate by time of day and day of the week. This is key for forecasting staffing needs and understanding peak sales periods.
* **Effective SQL Aggregations:**  
  Working with large datasets, I refined my ability to aggregate data efficiently using SQL’s GROUP BY and SUM functions. I even formatted sales data into more readable "k" units, making the insights much easier to digest.
* **Sales Comparison:**  
  I also learned how to use SQL’s window functions to compare daily sales against the monthly average, which helps spot unusually high or low sales days. It’s great for identifying seasonal trends and planning marketing or promotional activities accordingly.

**Detailed Methodology**

Here’s a breakdown of the steps I took to complete this project:

1. **Creating the Coffee Shop Database & Sales Table:**
   * I designed and implemented a database schema that included key attributes like transaction\_id, transaction\_date, transaction\_qty, unit\_price, product\_category, and store\_location.
2. **Total Sales Calculation:**
   * I calculated the total sales for each month by multiplying the unit\_price by transaction\_qty and summing the results, rounding for clarity.
3. **Month-over-Month (MoM) Growth Calculation:**
   * Using the LAG() function, I tracked MoM sales growth, helping me identify how each month compared to the previous one.
4. **Total Orders Analysis:**
   * I calculated the total number of unique orders using COUNT(DISTINCT transaction\_id), which provided insights into customer behavior and purchase frequency.
5. **Sales by Store Location:**
   * By aggregating and ranking sales by store location, I could visualize which stores are performing well and which might need some attention.
6. **Sales by Product Category & Type:**
   * I analyzed product categories and types (like “coffee” or “snacks”) to identify the top revenue-generating items.
7. **Daily and Hourly Sales Trends:**
   * With daily and hourly sales data, I explored how sales fluctuate throughout the day and the week, helping the business plan for peak hours.
8. **Data Aggregation & Formatting:**
   * I used SQL functions like CONCAT() and ROUND() to format sales figures in a more digestible way, making the data much easier to interpret.
9. **Sales Status by Day:**
   * I categorized each day’s sales as “Above Average” or “Below Average” compared to the month’s average, which helped highlight the standout days.
10. **Sales Performance by Hour of Day:**
    * I specifically analyzed sales by hour to identify the best times for sales, enabling better resource allocation and decision-making.

**SQL Queries Overview**

Here’s a quick glimpse into the key queries I used during the project:

* **Total Sales for May:**  
  I calculated the total sales by multiplying unit prices with quantities sold and summed the values for May.
* **Month-over-Month Sales Growth:**  
  Using LAG(), I calculated the MoM percentage change in total sales and quantities between April and May.
* **Total Orders:**  
  I counted the distinct transaction IDs to determine how many unique orders were made.
* **Daily Sales Analysis:**  
  I aggregated sales for each day and compared them to the average daily sales, categorizing days as “Above Average” or “Below Average.”
* **Hourly Sales Patterns:**  
  I analyzed hourly sales to find peak sales periods, helping businesses optimize staffing and operations.
* **Store & Product Sales Breakdown:**  
  I grouped sales by store location and product category to identify top performers and low performers.

**Future Enhancements**

While the analysis is already valuable, there’s so much more that can be done to enhance this project:

* **Forecasting Sales:**  
  Exploring time-series forecasting models could provide valuable predictions for future sales, helping businesses plan ahead for staffing and inventory.
* **Real-time Reporting:**  
  Integrating with BI tools like Power BI or Tableau could make the data more dynamic and provide real-time dashboards for ongoing analysis.
* **Advanced Trend Analysis:**  
  Extending the analysis to include seasonal trends, promotions, and marketing activities would give deeper insights into how different factors impact sales performance.