The City College of New York

ECON 32500, Fall 2024, Final Project

Team Member:
Emir Dincer

Research Question:
What actions can the company take to increase profits over the last quarter?

Justification:
This project aims to investigate underlying trends and correlations within the company's data to pinpoint actionable conclusions. By evaluating key business metrics such as customer loyalty, product profitability, store efficiency, and sales trends, we will establish specific opportunities to drive improvements in profit. This research is essential to optimize performance and address potential inefficiencies in operations or strategies.

Data Collection:
Data will be drawn exclusively from the provided SQL server, including the following tables:

- proj_sales: Transaction details including dates, revenue, and profit.
- proj_products: Attributes such as product category, costs, and prices.
- proj_customers: Information on customer demographics.
- proj_stores: Store size, location, and inventory availability.
- proj_exchange_rates: Exchange rate data to evaluate profitability in multi-currency scenarios.

Analysis will integrate Python for data manipulation and visualization, alongside Tableau or PowerBI for interactive dashboards.

Libraries:

Sqlalchemy - Access to SQL data

Pandas - Working with SQL data to plot

Pyplot & Seaborn - Plotting data

Datetime - Datetime data manipulation

Proposed Analytical Framework:

1. **Customer Loyalty and Retention:**
    - Quantify repeat purchases and identify patterns among customers who make multiple transactions.
    - Examine whether customer churn (non-returning customers) is significant, focusing on evaluating if investments in loyalty programs are yielding returns.
2. **Product Profitability:**
    - Correlate profit margins with sales volumes to identify products that maximize profitability.
    - Focus on the interplay between high-margin items and high-volume items to recommend emphasis areas for growth.
3. **Store Size vs. Revenue:**
    - Analyze the relationship between store size and inventory to explain performance disparities.
    - Investigate why larger stores might yield higher revenue and identify outliers.
4. **Sales Seasonality and Anomalies:**
    - Explore monthly sales to identify dips and spikes.
    - Evaluate days or months with consistently low sales and suggest potential interventions (e.g., marketing campaigns, store-specific promotions).
    - Highlight anomalies such as unusually high or low sales in specific locations or products

Project Goals:

- Draw conclusions directly from the data to support profit maximization in the upcoming quarter.
- Uncover inefficiencies or anomalies to enhance clarity and drive actionable change.
- Provide clear visualizations to communicate findings effectively.

Deliverables:

1. **Analysis Report:** Concise presentation of findings, focusing on clear insights derived from the data.
2. **Submission Materials:** Complete Python scripts, SQL queries, and dashboards uploaded to the class GitHub repository.

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