Executive Summary: Walmart Sales Report SQL Analysis

Project Overview

This project presents a comprehensive analysis of Walmart's sales data across various branches. Utilizing SQL for data querying and Pandas for data cleaning and processing, the objective was to extract key business insights related to customer behavior, product performance, revenue trends, and operational efficiency. The analysis supports strategic planning and performance optimization across multiple levels of the business.

Tools and Technologies Used

- **SQL: For querying structured data and performing complex aggregations.**
- **Pandas (Python): For data cleaning, preprocessing, and transforming raw datasets into structured formats suitable for analysis.**

Key Objectives and Insights

1. **Payment Method Insights**
    - **Identified all unique payment methods.**
    - **Measured transaction count and quantity sold per method to understand customer preferences.**
2. **Top-Rated Categories by Branch**
    - **Determined the highest-rated product category in each branch using average customer ratings.**
3. **Peak Operational Days**
    - **Found the busiest day of the week for each branch based on transaction volume, aiding in operational planning.**
4. **Quantity Sold by Payment Type**
    - **Calculated total quantity of items sold across different payment methods for payment channel optimization.**

5. **Customer Ratings by City**
    - **Analyzed average, minimum, and maximum product ratings by city to identify regional satisfaction trends.**
6. **Category-Wise Profitability**
    - **Computed total profits by category using:**
      Total Profit = Unit Price × Quantity × Profit Margin
    - **Ranked categories by profit to inform marketing and inventory priorities.**
7. **Branch-wise Preferred Payment Method**
    - **Identified the most frequently used payment method for each branch.**
8. **Sales Shift Analysis**
    - **Grouped sales into Morning, Afternoon, and Evening categories.**
    - **Revealed shift-wise invoice counts for workforce and sales strategy alignment.**
9. **Revenue Decline Analysis**
    - **Detected the top five branches with the largest year-over-year revenue decline (2022 vs. 2023).**

Business Impact

By combining SQL analytics with Pandas-powered preprocessing, the project:

- **Uncovered valuable trends in payment and shopping behavior.**
- **Enabled city and branch-specific insights to guide localized strategies.**
- **Identified key profitability drivers to boost revenue.**
- **Provided shift-level and daily operational insights for resource allocation.**

Conclusion

This project demonstrates the power of combining SQL for analysis and Pandas for data processing to produce business-ready insights. The report empowers Walmart with actionable intelligence for improving customer satisfaction, operational planning, and revenue growth.

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