RETAIL BUSINESS PERFORMANCE & PROFITABILITY ANALYSIS

Objective

The project aims to analyze transactional retail data to uncover profit-draining product categories, optimize inventory turnover, and identify seasonal product behavior. The analysis was conducted using SQL for data cleaning and querying, Python for exploratory analysis and correlation studies, and Tableau for dashboard visualizations.

Tools & Technologies

- SQL: Data import, cleaning, and profit margin calculations
- Python: Exploratory data analysis, correlation between shipping delays and profitability
- Tableau: Interactive dashboard for actionable insights

Step-by-Step Summary & Key Insights

1. Data Cleaning (SQL)

- Imported raw Superstore dataset into MySQL Workbench.
- Removed duplicates and NULL records from critical columns like Order ID, Order Date, Sales, and Profit.
- Handled date format inconsistencies during import.
- Enhanced data with calculated columns such as Profit_Margin, Ship_Delay_Days, and Month.

Insight: Cleaned data ensured consistency across tools and allowed meaningful business analysis without skewed results.

2. Profit Margin Analysis (SQL)

- Calculated profit margins by **Category** and **Sub-Category** using SQL aggregation queries.
- Identified key segments where profit margins were consistently negative.

Insight:
Sub-categories like **Tables**, **Binders**, and **Bookcases** often showed lower or negative profit margins, signaling the need for re-evaluation of pricing or discounts.

3. Shipping Delays & Profitability (Python)

- Used Python to compute correlation between **shipping delays** and **profit margins**.
- Analyzed patterns by segment and region.

Insight:
There was a **mild negative correlation** between shipping delay and profitability, indicating that longer delivery times may impact customer satisfaction and return behavior.

4. Seasonal & Regional Trends (Tableau)

- Built a **Monthly Sales Trend** line chart to identify seasonal sales spikes.
- Added region filter to isolate performance by geography.

Insight:
Sales tend to **peak in November and December**, suggesting strong holiday demand. The **West** region performed consistently well across most product lines.

5. Product Performance Dashboard (Tableau)

Created four key visualizations:

- Profit Margin by Sub-Category
- Monthly Sales Trend
- Slow-Moving Products
- Top Loss-Making Products

Insights:

- **Slow-Moving Products:** Items like certain labels, binders, and accessories sold infrequently despite regular stocking.
- **Top Loss-Making Products:** Some high-discount electronics and furniture items led to consistent losses.
- **Overstocked Products:** Showed clear inventory inefficiencies needing adjustment in purchasing decisions.