Retail Sales Performance & Profitability Analysis

Prepared for: Elevate Labs
Format: Python (Jupyter Notebook) + Tableau Dashboard

🔹 Introduction

In a data-driven retail environment, understanding product performance, profitability, and customer behavior is crucial. This project aims to evaluate sales trends, regional performance, customer segmentation, and inventory efficiency to uncover strategic insights that can enhance profitability and streamline operations.

🔹 Abstract

The analysis combines Python and Tableau to process and visualize retail sales data from 2014 to 2018. Key objectives include identifying top-performing products and segments, assessing regional profit disparities, evaluating the impact of shipping modes, and detecting slow-moving inventory. Insights gathered support informed business decisions around inventory planning, pricing strategy, and customer targeting.

🔹 Tools Used

- **Python (Jupyter Notebook):** For data cleaning, transformation, querying (via pandasql), and statistical analysis.
- **Tableau:** For creating an interactive dashboard covering KPIs like sales trends, customer segments, profitability, and geographic performance.
- **Excel:** Source data file (Superstore Sales.xlsx).

🔹 Steps Involved in Building the Project

1. **Data Cleaning & Preprocessing:**
    - Handled missing values and parsed datetime fields.
    - Created new calculated fields such as ProfitMargin and InventoryDays.

2. **Exploratory Data Analysis in Python:**
    - Used pandasql to analyze profit margins by category and sub-category.
    - Built visualizations (scatter plots, heatmaps) to assess correlation between inventory time and profit.
    - Filtered slow-moving inventory based on quantity, profit margin, and shipping delay.

3. **Dashboard Development in Tableau:**
    - Designed sales and order trends over time.
    - Analyzed customer segmentation and regional profit distribution using maps.
    - Assessed product profitability and shipping mode impact.
    - Created a Sales vs Profit scatter plot for visual SKU benchmarking.

🔹 Conclusion

The project reveals that **Technology and Office Supplies are the most profitable categories**, while **Standard Class is the most utilized shipping mode**. **Consumers** dominate the customer base, and **Phones, Chairs, and Copiers** are high-margin products. However, some regions and product categories (e.g., Furniture, Machines) underperform and require targeted strategies. Identifying slow-moving inventory further enables stock optimization.