

Retail Business Performance & Profitability Analysis

1. Introduction

This project aims to analyze sales and profit data from the Superstore dataset to identify key patterns in product performance, regional trends, inventory behavior, and to recommend data-driven strategies for improving business profitability.

2. Abstract

Using Python libraries such as Pandas, Seaborn, and Matplotlib, the dataset was cleaned and explored to uncover meaningful insights. The project focused on identifying which product categories and regions drive the most profit, how time (both seasonality and weekday patterns) affects sales, and how inventory holding periods relate to profitability. The analysis is summarized through visualizations and backed by business recommendations.

3. Tools Used

- Python (Pandas, Seaborn, Matplotlib)
- Jupyter Notebook
- PowerPoint (for final presentation)

4. Steps Involved in Building the Project

- Data Cleaning & Preprocessing: Handled missing values, converted date columns, and created a new metric for inventory days.
- Exploratory Data Analysis (EDA): Performed analysis on category-wise profitability, regional sales trends, shipping modes, and time-based performance.
- Visualization: Used bar plots, line charts, scatterplots, and heatmaps to support hypotheses and extract insights.
- Hypothesis Testing: Four hypotheses were tested, including profit differences by category, sales by region, quarterly performance, and weekday profit variation.
- Reporting: Findings were compiled into a final presentation and this summary report.

5. Key Insights

- Technology is the most profitable category
- The West is the top-performing region in terms of sales

Retail Business Performance & Profitability Analysis

- Q4 shows highest sales volume
- Profit is higher on weekend compared to weekdays.

6. Conclusion

- Data-driven insights can guide strategic decisions
- Clear profit patterns by category and region
- Inventory and time-based factors significantly impact business outcomes