Retail Business Performance & Profitability Analysis

Introduction

In today's competitive retail environment, businesses must constantly analyze performance metrics to stay profitable. This project focuses on identifying underperforming categories, evaluating profit margins, and understanding the impact of inventory days on profitability using a sample retail dataset.

Abstract

The objective of this project is to analyze transactional retail data to uncover profit-draining categories, optimize inventory turnover, and identify seasonal product behavior. Through exploratory data analysis, SQL queries, and Python scripting, we identified critical insights that can support strategic business decisions.

Tools Used

- Python (Pandas, Seaborn, Matplotlib)
- SQL (PostgreSQL)
- Tableau (represented via Python-based visuals)
- Microsoft Word / PDF for documentation

Steps Involved in Building the Project

1. Imported and cleaned sample retail data (removed missing values and formatted columns).
2. Used SQL to calculate profit margins by category and sub-category.
3. Conducted correlation analysis between inventory days and profitability using Python.
4. Visualized key metrics such as Sales by Region and Discount vs Profit.
5. Created a mock dashboard using Matplotlib to simulate Tableau visualizations.
6. Derived actionable insights and suggestions for improving profitability.

Conclusion

The analysis uncovered patterns in sales, profits, and inventory dynamics. Categories like Technology showed high profitability with low inventory days. In contrast, overstocked items in Furniture impacted margins negatively. Recommendations include reducing inventory holding periods, adjusting discount strategies, and focusing on high-margin product categories for sustainable profitability.