Retail Business Performance & Profitability Analysis

Introduction

In the competitive landscape of retail, optimizing inventory and improving profitability are key challenges. This project analyzes transactional retail data to identify profit-draining product categories, uncover seasonal sales trends, and evaluate the relationship between inventory turnover and profitability.

Abstract

Using SQL, key metrics such as profit margins by category and region were derived. Python was employed to run correlation analyses and visualize trends like inventory turnover vs profit. Finally, Tableau (mocked through matplotlib) was used to simulate interactive dashboards, helping visualize seasonal behavior and regional performance. Insights from this analysis can guide inventory and marketing strategy.

Tools Used

- SQL: Data cleaning and profit metric calculation
- Python (Pandas, Seaborn): EDA, correlation analysis
- Tableau (Mockups): Dashboard visualizations and KPIs

Steps Involved in Building the Project

1. Data Cleaning (SQL): Removed nulls, duplicates; calculated profit margins by sub-category.
2. Exploratory Analysis (Python): Created heatmaps, correlation matrices, and trends for monthly sales.
3. Dashboard Mockups (Simulated Tableau): Built visual mockups for profit margin, inventory impact, and seasonal trends.
4. Strategic Insight: Identified slow-moving, overstocked items; recommended focusing on high-margin seasonal products.

Conclusion

This project successfully integrated SQL, Python, and data visualization to extract actionable insights from retail data. The approach highlights how overstocking affects profits, which categories are most profitable, and how to plan for seasonal demand. These insights are vital for making smarter inventory, marketing, and financial decisions.