Retail Business Performance & Profitability Analysis

Introduction:

This project focuses on analyzing transactional retail data to identify profit-draining categories, optimize inventory turnover, and uncover seasonal product trends. By combining SQL, Python, and Power BI, the analysis provides data-driven insights for retail decision-making, emphasizing efficiency in stock management and profitability.

Abstract:

The analysis integrates structured SQL queries to clean and process data, Python (Pandas, Seaborn) for statistical correlation and trend detection, and Power BI for visualization. It uncovers relationships between inventory levels, sales performance, and profitability across categories, highlighting slow-moving and overstocked items.

Tools Used:

Tool	Purpose
SQL	Data cleaning, profit margin calculations, and data aggregation.
Python	Correlation analysis and computation of inventory turnover metrics.
Power bi	Interactive dashboard creation with filters for Region, Product Type, and Season.

Steps Involved in Building the Project:

1. Data Import & Cleaning: CSV data imported into MySQL. Missing or null records were handled using SQL scripts.
2. SQL Analysis: Profit margins were calculated by category and sub-category to identify top-performing and low-performing areas.
3. Python Correlation: Using Pandas and Seaborn, correlation was computed between inventory days and profitability.
4. Power BI Dashboard: Built visuals with filters for Region, Product Type, and Season to explore profitability and stock dynamics.
5. Strategic Insights: Identified slow-moving SKUs (inventory days > 90) and overstocked items for promotional or redistribution strategies.

Conclusion:

This retail performance analysis successfully integrated data analytics techniques to optimize inventory management and improve profitability. The Power BI dashboard offers a unified view of sales, stock movement, and profit trends. The project demonstrates the value of data-driven retail management, suggesting actions for slow-moving items, balancing stock levels, and identifying high-profit product lines.