Retail Business Performance & Profitability Analysis

1. Introduction

This project was undertaken to analyze retail transactional data with the goal of improving business performance, identifying profit-draining areas, and optimizing inventory turnover. By using a combination of SQL, Python (Pandas), and Power BI, we were able to uncover actionable insights that can drive strategic retail decisions.

2. Abstract

The dataset contained detailed sales transactions, including product categories, profits, costs, and customer segments. The analysis was carried out using SQL for structured queries and transformations, Python for correlation and pattern detection, and Power BI for interactive data visualization. The project provided valuable insights into top-performing product segments, seasonal trends, and slow-moving or overstocked inventory.

3. Tools Used

- SQL (MySQL Workbench) – Data querying, cleaning, transformation, and aggregation
- Python (Pandas, Matplotlib, Seaborn) – Data analysis and correlation
- Power BI – Visualization and dashboard development
- Jupyter Notebook – Python-based analysis scripting
- Microsoft Word – Reporting and documentation

4. Steps Involved in Building the Project

- Loaded and cleaned retail transactional dataset.
- Checked for missing values and validated data structure.
- Created SQL views to group products into meaningful categories and sub-categories.
- Performed SQL queries to calculate sales, profit, and margin metrics.
- Imported dataset into Python for in-depth analysis and visualization.
- Calculated correlation between inventory days and profitability.
- Identified slow-moving and overstocked items.
- Built an interactive Power BI dashboard with filters for region, season, and product type.
- Documented and summarized insights in a final report.

5. Conclusion

This project provided comprehensive insights into the sales and profit performance of a retail business. The combination of SQL, Python, and Power BI enabled a well-rounded analysis from raw data cleaning to interactive dashboard reporting. The results highlighted strategic opportunities for product promotion, seasonal marketing, and inventory optimization.