Project Report: Retail Business Performance & Profitability Analysis

Introduction

This project aimed to analyse retail business performance and profitability by leveraging a cleaned retail dataset. The primary objective was to identify sales trends, profitability drivers, and regional performance variations. By integrating Python, SQL, and Power BI, the project provided an end-to-end solution from data preparation to visualization enabling actionable insights for better business decision-making.

Abstract

The project involved analysing retail sales data to understand key factors influencing profitability and performance. Data preprocessing was carried out in Python (Jupyter Notebook), ensuring accuracy and consistency of the dataset. SQL queries were used to extract insights such as sales growth trends, regional performance, and top/least profitable products. Finally, interactive dashboards were built in Power BI, covering executive summaries, product-level analysis, and regional breakdowns. The insights support identifying top-performing categories, managing slow-moving inventory, and optimizing business strategies.

Tools Used

- **Python (Pandas, Matplotlib, Seaborn):** Data cleaning, preprocessing, and exploratory data analysis.
- **SQL (MySQL):** Querying for sales, profit, and growth insights.
- **Power BI:** Dashboard creation and interactive data visualization.

Steps Involved in Building the Project

1. **Data Cleaning & Preprocessing**
    - Removed duplicates and missing values.
    - Converted data types (e.g., dates, numeric fields).
    - Created calculated fields such as Net Price, Profit Margin, and Inventory Turnover.

2. **Exploratory Data Analysis (EDA)**
    - Identified sales and profit trends over time.
    - Analysed category-level and regional-level contributions.
    - Examined profit margin distribution and inventory movement.
3. **SQL Analysis**
    - Extracted insights through queries such as:
        - Monthly sales and profit trends.
        - Top 5 products by sales and least profitable products.
        - Region-wise profitability and slow-moving inventory detection.
4. **Power BI Dashboard Development**
    - **Page 1: Executive Summary** – Total sales, total profit, profit margin %, total orders, average order value, growth trends.
    - **Page 2: Product Performance** – Top/least profitable products, category profitability, profit margin distribution, top products by sales.
    - **Page 3: Regional Performance** – Region-wise profitability, sales by region (map view), sales & profit trend by month, and top products per region.

Conclusion

The project successfully provided a comprehensive analysis of retail performance across products, categories, and regions. The dashboards revealed both profitable and loss-making products, regional strengths and weaknesses, and growth trends over time. These insights can help businesses focus on high-performing areas while addressing underperforming ones. Beyond technical skills in Python, SQL, and Power BI, this project reflects the ability to transform raw data into strategic insights, making it a strong highlight for professional portfolios and resumes.