Retail Business Performance & Profitability Analysis

Introduction
Retail businesses often face challenges in balancing sales growth, profitability, and inventory management. This project aims to analyze transactional data to identify profit-draining categories, optimize inventory turnover, and uncover seasonal product behavior, leading to actionable strategic recommendations.

Abstract
This study integrates **SQL, Python, and Tableau** to analyze a retail dataset. SQL was used for data cleaning, preprocessing, and deriving KPIs such as sales, profit, and discount impacts. Python (Pandas, Seaborn) enabled statistical analysis, particularly correlation between inventory days and profit margins. Tableau provided interactive dashboards for visual insights into trends, categories, discounts, and inventory risks. The analysis highlighted loss-making categories, slow-moving and overstocked items, and seasonal sales opportunities, leading to strategic business recommendations.

Tools Used
- **SQL**: Data cleaning, KPIs, profit-margin analysis, inventory queries.
- **Python (Pandas, Seaborn, Matplotlib)**: Statistical correlation, data visualization.
- **Tableau**: Dashboards for sales trends, category performance, discount impact, inventory risk.

Steps Involved in Building the Project
1. **Data Preprocessing (SQL)** – Created database & table, handled null values, trimmed text fields, standardized formats.
2. **Exploratory Analysis (SQL)** – Generated KPIs, sales & profit trends, profit margin by category/sub-category, discount impact, seasonal patterns, slow-mover & overstock detection.
3. **Python Analysis** – Correlation study between days since last sale and profit margin %, visualization of stock behavior.
4. **Visualization (Tableau)** – Built dashboards showing KPIs, category/sub-category performance, monthly trends, discount effects, and inventory health.
5. **Strategic Suggestions (PDF)** – Derived recommendations:
- Limit discounts in loss-making subcategories (e.g., Tables, Bookcases).
- Run clearance sales/bundling for slow-moving products.
- Reduce re-orders for overstocked low-margin products.
- Apply ABC classification for inventory control.
- Leverage seasonal spikes (Nov–Dec) for targeted promotions.

Conclusion
The project demonstrates how integrated use of SQL, Python, and Tableau can uncover hidden inefficiencies in retail operations. Insights on profit-draining categories, discount impacts, and inventory risks enable data-driven decisions. The strategic recommendations, if implemented, can improve overall profitability, optimize inventory costs, and enhance customer satisfaction. Tableau dashboards can be updated regularly to track ongoing performance.