Retail Business Performance & Profitability Analysis

1. Introduction:
This project focuses on analyzing retail transactional data to evaluate business performance and profitability. The goal is to identify high-performing products, profit-draining categories, customer patterns, and revenue trends to support data-driven decision-making.

2. Abstract:
The dataset used for this project includes historical transaction records with fields like InvoiceNo, Product Description, Quantity, Unit Price, and Invoice Date. We conducted thorough data cleaning and analysis using Python and MySQL. The cleaned data was imported into Power BI to create an interactive dashboard for visualization. Key insights were extracted on sales, customer behavior, and profitability.

3. Tools Used:

- Python (for data cleaning)
- MySQL via DBeaver (for querying and analysis)
- Power BI (for dashboard visualization)

4. Steps Involved in Building the Project:

- **Data Cleaning:** Removed rows with missing customer/product data, filtered out cancelled transactions, and removed records with negative prices or quantities. Created a new column 'TotalPrice'.
- **SQL Analysis:** Used MySQL to extract insights such as total revenue, top products by profit, customer trends, and monthly sales.
- **Power BI Dashboard:** Built visualizations for revenue trends, top-selling products, profit margins, and country-wise performance.
- **Conditional Formatting:** Highlighted low-margin products in red to identify underperformers.
- **Advanced Analysis:** Created profit calculation formula and bubble charts to analyze quantity vs. profit vs. total price.

5. Conclusion:
The analysis revealed that a small number of products contribute significantly to total revenue. There is a clear seasonal pattern in sales trends. Low-margin products were identified for possible discontinuation. The dashboard and SQL insights equip decision-makers with actionable information to optimize inventory, pricing, and marketing strategies.