Retail Business Performance & Profitability Analysis

1. Objective

The goal of this project is to analyze transactional retail data to:
- Identify profit-draining categories and products
- Optimize inventory turnover by spotting slow-moving or overstocked items
- Uncover seasonal sales and profit behavior
- Provide actionable insights for management decisions

2. Tools & Technologies

- SQL → Data import, cleaning, profit margin calculations
- Python (Pandas, Seaborn) → Exploratory analysis, correlation study
- Tableau → Interactive dashboards and visualization

3. Methodology

Step 1: Data Preparation
- Imported raw transactional data into MySQL
- Cleaned missing/null records
- Exported the cleaned dataset into CSV for Python & Tableau usage

Step 2: SQL Analysis
- Calculated Profit Margin by Category & Sub-Category
- Identified categories with consistently negative profits
- Generated summary tables for Sales, Profit, and Quantity

Step 3: Python Analysis
- Created a derived column Days_To_Ship = Ship_Date - Order_Date
- Used correlation analysis to study the relationship between shipping delays and profitability
- Found that longer shipping times often reduced profitability

Step 4: Tableau Dashboard
Developed an interactive dashboard with the following sheets:
1. Profit by Category & Sub-Category
2. Monthly Sales & Profit Trend
3. Days_To_Ship vs Profit
4. Region-wise Sales & Profit

Filters added: Region, Category, Sub-Category,

4. Key Insights

- Profit Drainers: Furniture (Bookcases & Tables) showed negative or low profitability despite goodsales.

- Slow-Moving Items: Certain products had low sales volume + low profit → potential overstock issues.
- Shipping Delays Impact: Orders with higher Days_To_Ship correlated with reduced profit margins.- Regional Trends: West Region → Highest sales and profit contribution; South Region → Lower profitability despite moderate sales.

5. Strategic Recommendations

1. Reduce Overstock: Phase out or discount slow-moving, low-profit products.
2. Focus on Profitable Categories: Increase marketing and stock for Office Supplies & Technology,which have higher profit margins.
3. Optimize Shipping: Improve logistics to reduce Days_To_Ship, thereby improving profitability.
4. Regional Strategy: Apply targeted campaigns in South region to improve profitability.

Conclusion

This project demonstrates how integrating SQL, Python, and Tableau can provide a 360° view of retail business performance.

The insights can directly guide inventory management, pricing, and marketing strategies to maximize profitability.