

Retail Business Performance & Profitability Analysis

Introduction

This project analyzes a retail transactional dataset to uncover key insights into profitability, inventory turnover, and product behavior. Using SQL, Python, and visualization tools, the aim was to identify profit-draining categories, seasonal trends, and suggest actionable strategies for business improvement.

Abstract

A cleaned retail dataset was examined to identify underperforming product categories and optimize inventory. SQL was used for profitability calculations, Python for correlation analysis and visualizations, and Tableau/Python visual outputs helped derive actionable insights. The project highlights areas of low turnover, seasonal demand spikes, and top-revenue products.

Tools Used

- SQL (SQLite)
- Python (Pandas, Seaborn, Matplotlib)
- Tableau / PNG Charts (optional)
- Jupyter Notebook / VS Code (for scripting)

Steps Involved in Building the Project

1. Data Cleaning:
 - Removed null and duplicate values.
 - Converted data types (e.g., InvoiceDate to datetime).
 - Calculated TotalSales = Quantity × UnitPrice.
2. SQL Analysis:
 - Imported data into SQLite.
 - Queried for profit margins by category and subcategory.
 - Filtered top revenue-generating and slow-moving items.
3. Python Analysis:
 - Created new columns like Month, TotalSales.
 - Analyzed monthly revenue trends (Line Chart).
 - Identified top 10 products by revenue (Bar Chart).
 - Visualized relationship between quantity sold and revenue (Dot Chart).
4. Visualizations:
 - Used Seaborn & Matplotlib to create:
 - Monthly Revenue Trend
 - Top Products by Revenue
 - Quantity vs Total Sales
5. Strategic Insights:
 - Identified slow-moving products to consider for clearance.
 - Suggested re-stocking fast-selling, high-revenue items.
 - Highlighted peak seasonal demand periods.

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Conclusion

The analysis highlighted critical insights into the business's inventory and profit structure. Visualizations enabled a clear understanding of sales trends and product performance. These findings can drive better inventory decisions, reduce loss from overstocking, and improve profitability through strategic restocking.