Retail Business Performance & Profitability – Key Insights Report

1. **Introduction Retail Business Performance & Profitability Analysis**
   This project analyzes transactional retail data to uncover profit-draining categories, optimize inventory turnover, and identify seasonal product behaviors.
2. **Abstract**
   Retail businesses often suffer from hidden profit drains and inefficient inventory management. By leveraging SQL for data querying, Python for statistical analysis, and Tableau for visualization, we explore patterns in retail data to derive actionable business insights.
3. **Tools Used-**
   - **SQL: For querying and margin analysis**
   - **Python (Pandas, Seaborn): For data preprocessing and correlation**
   - **Tableau: For interactive dashboards and insight visualization**

4. Steps Involved in Building the Project

1. **Imported and cleaned dataset in SQL**
2. **Calculated profit margins by category and sub-category**
3. **Performed correlation analysis between inventory days and profitability using Python**
4. **Built an interactive Tableau dashboard with filters for region, season, and category**
5. **Recommended strategies for slow-moving and overstocked inventory**

5. Conclusion

This analysis revealed critical areas of profit loss and inefficient stock handling. Key insights include which product lines underperform seasonally and how inventory days affect overall profitability. Strategic recommendations include focused discounting and supply chain optimization

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🔹 **1. SQL-Based Insights**

Profit Margins by Category:

- **Electronics**: High margin (**33%**) despite medium revenue.
- **Groceries**: Highest profit margin (**34%**) — strong contributor.
- **Furniture**: **Negative profit (-28%)** — major loss category.
- **Clothing**: Very low margin (**1%**) — not effectively profitable.

Profit Margins by Sub-Category (Top/Bottom):

- **Top Profitable Sub-Categories**:
  - **Jackets**: 71%
  - **Headphones**: 66%
  - **Beverages**: 53%

- **Worst Performing Sub-Categories**:
    - **Tables**: -64%
    - **Trousers**: -39%
    - **Fruits**: -24%

Regional Profitability:

- **West**: Highest performing region (**₹61.3k profit**)
- **North & South**: Loss-making zones (₹-37k and ₹-25k)

Seasonal Revenue & Profit:

- **Summer**: Highest profit (**₹54.7k**)
- **Winter**: High revenue, **but losses of ₹-45.7k**
- **Autumn**: Losses (**₹-442**) despite decent revenue

🔹 **2. Python-Based Insights**

Correlation between Inventory Days & Profit:

- Correlation = **-0.07**
- ✅ Insight: Slight **negative correlation** → higher inventory days tend to reduce profit, but not strongly.

Average Inventory Days by Category:

- **Electronics**: Highest average (**137 days**) → slower turnover
- **Clothing**: Fastest turnover (**74 days**) but low profitability

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🔹 **3. Tableau Dashboard Insights**

- **Interactive Filters**: Region, Season, Category/Sub-Category
- **Inventory vs. Profit Plot**: Most profitable items clustered at **low inventory days**
- **Profit Heatmap**:
    - **High: West Region with Electronics & Groceries**
    - **Low: Furniture across all regions**
- **Sales by Season**: Winter has high sales but **poor profitability**, suggesting promotional losses or high costs

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Strategic Recommendations

1. **Stop stocking loss-heavy sub-categories** (e.g., Tables, Trousers).
2. **Optimize Furniture inventory** — high holding cost, low margins.
3. **Expand profitable categories** (Jackets, Beverages, Headphones).
4. **Audit winter season promotions** — high sales, low returns.
5. **Improve West Region strategy** — replicate success elsewhere.