Project Report: Retail Business Performance & Profitability Analysis

Introduction

- Analysis of retail data to understand profitability, inventory, and seasonality.
- Aims to provide actionable insighpts for business optimization.
- Utilized SQL, Python (Pandas, Seaborn), and Tableau.

Abstract

- Analyzed retail data for profit margins, inventory correlation, and visualized key metrics.
- Identified profit variations across product segments and a weak inventory-profit correlation.
- Revealed potential regional and seasonal performance differences.
- Provides a basis for strategic decisions in inventory, product focus, and regional approaches.

Tools Used

- SQL: Data cleaning, aggregation (profit margins by category/subcategory), extraction.
- Python (Pandas): Data manipulation, correlation analysis (inventory days & profit).
- Python (Seaborn): Visualization of data distributions (inventory days, stock).
- Tableau: Interactive dashboard creation with filters (region, product, season) for KPI visualization.

Steps Involved

1. **Data Cleaning (SQL):** Removed records with NULLs in key fields (Category, Sub_Category, Sales, Profit, Quantity, Cost).

2. **Profit Margin Calculation (SQL & Python):** Calculated profit margins by Category and Sub_Category (e.g., Clothing - Kids: 27.96%, Electronics - Smartphones: 28.74%).

3. **Inventory Analysis (Python):** Calculated a weak negative correlation (-0.007185) between Inventory_Days and Profit; visualized inventory distributions.

4. **Dashboard Development (Tableau):** Created interactive dashboards showing sales, profit, quantity, and breakdowns by region, product, and season.

5. **Regional Analysis (SQL & Tableau):** Aggregated and visualized sales/profit by region, category, and sub-category to identify regional performance.

6. **Seasonal Analysis (Tableau):** Utilized time-based filters to explore sales and profit trends across different time periods.

Conclusion

• **Significant variations exist in profit margins across product segments.**
• **A weak linear relationship was observed between overall inventory days and profit.**
• **Potential for notable regional and seasonal differences in performance.**
• **Tableau dashboard enables interactive exploration for data-driven decisions.**
• **Further analysis needed for a deeper understanding of inventory-profit dynamics and seasonal impacts.**