Retail Business Performance & Profitability Analysis

1. Objective

To analyze transactional retail data to uncover profit-draining categories, optimize inventory turnover, and identify seasonal product behavior.

Tools used: SQL, Python (Pandas, Seaborn), Tableau

2. Key Metrics Calculated

- Profit Margin = Profit / Sales
- Inventory Days = Ship Date - Order Date
- Turnover Ratio = Quantity Sold / Inventory Level (simulated or estimated)
- Slow Movers = Products with turnover ratio below threshold

3. Data Cleaning & Preparation

- Cleaned missing or null records using Pandas and SQL.
- Filtered out rows with zero sales, missing dates, or non-positive values.
- Created fields such as Profit Margin and Inventory Days for analysis.

4. Key Findings

- Categories like [e.g., Office Supplies] had high sales volume but low profitability.
- Several products showed low turnover ratios - flagged as 'Slow Movers'.
- Seasonal behavior identified - Sales spiked in Q4 (Winter), lowest in Summer.
- Weak negative correlation observed between Inventory Days and Profit Margin, suggesting longer inventory holding slightly reduces profitability.

5. Dashboard Overview

Built in Tableau Public, including:

- KPI Cards for Sales, Profit, Quantity
- Filters for Region, Product Type (Category/Sub-Category), and Season
- Bar Charts identifying slow-moving products based on turnover ratio

- Line Charts for seasonal trends
- Correlation Insights from Python

6. Strategic Recommendations

- Focus on clearing slow-moving inventory to free up cash flow.
- Adjust pricing or bundling for low-margin categories.
- Consider seasonal stock optimization to match historical demand.
- Review shipping delays and optimize Order-to-Ship processes to reduce Inventory Days.