

# Retail Business Performance & Profitability Analysis

## Introduction

This project analyzes transactional retail data to identify profit-draining categories, optimize inventory turnover, and reveal seasonal behavior. The deliverables include SQL queries, a Python analysis script, and a concise 2-page PDF report with key insights.

## Abstract

Using SQL we clean and enrich sales data to compute revenue, cost, profit, and margins. We aggregate at category, sub-category, and product levels to locate low-performing segments. Python (Pandas) computes correlations between inventory days and profitability and exports lists of slow-moving / overstocked SKUs. Tableau is recommended for an interactive dashboard with region/product/season filters.

## Retail Business Performance & Profitability Analysis — Report (page 2)

### Tools Used

- SQL (any RDBMS: Postgres / MySQL / SQLite)
- Python (Pandas, Matplotlib)
- Tableau (for interactive dashboard)

### Steps Involved

1. Import and clean data (remove nulls; correct types).
2. Enrich data with revenue, cost, profit, profit\_margin fields.
3. Calculate profitability by category and sub-category; identify low-profit areas.
4. Compute avg inventory\_days vs avg profit\_margin for correlation analysis.
5. Detect slow-moving and overstocked items using thresholds (e.g., >60 days & low sales).
6. Create Tableau dashboard with filters: Region, Category, Season (month/quarter).

### Conclusion & Strategic Suggestions

- Prioritize promotions and bundle deals for 'Slow & Overstocked' items to recover cash.
- Reprice or renegotiate supplier terms for low-margin categories.
- Improve inventory forecasting for SKUs with high days\_to\_clear.
- Use seasonal insights to align purchasing and promotions (move inventory before peak season).

Files included: /mnt/data/retail\_analysis.sql, /mnt/data/retail\_analysis.py,  
/mnt/data/retail\_report.pdf, /mnt/data/inventory\_vs\_margin.png,  
/mnt/data/slow\_overstock.csv