

# Retail Business Performance & Profitability Analysis

## Introduction

In today's dynamic retail landscape, understanding which products drive profitability and where performance gaps exist is critical. This project analyzes a fictional superstore's transactional dataset to identify:

- Profit-draining categories
- Seasonal sales patterns
- Inventory and profitability trends

The goal is to generate actionable insights to improve retail performance and decision-making.

## Abstract

This project evaluates category performance, seasonal trends, and profitability using:

- SQL for structured queries
- Python (Colab) for data analysis and visualization
- Tableau for interactive dashboards

The final output is an end-to-end data pipeline and dashboard that empowers retail decision-makers.

## Tools Used

- SQL (MySQL): Database design and analytical queries
- Python (Pandas, Seaborn, Matplotlib): Correlation analysis and data visualization
- Google Colab: Executing and sharing visual analysis
- Tableau Desktop: Building a professional interactive dashboard

## Project Workflow

### 1. Data Import & Cleaning

Imported the Superstore dataset into SQL. Cleaned data by removing nulls and fixing inconsistencies.

### 2. SQL Profitability Analysis

Used SQL queries to calculate:

- Total Profit
- Sales
- Profit Margin (by category and sub-category)

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## 3. Python Correlation Study

Performed correlation analysis between Quantity and Profit, revealing a strong positive correlation (Pearson coefficient ~ 0.9998).

Visualizations created:

- Scatter plots
- Bar charts highlighting high-volume, low-profit items

## 4. Tableau Dashboard Development

Interactive dashboard included:

- Bar chart: Profit margin by category
- Line chart: Monthly sales trends
- Scatter plot: Quantity vs. Profit
- Bar chart: Profit per unit (by sub-category)
- Filters: Region, Category, Date Range

## Conclusion

Key findings from the analysis:

- Furniture category showed lower profit margins
- Several sub-categories had low profit per unit
- Sales peaked in November, coinciding with holiday shopping

Impact:

Retail managers can use the dashboard to:

- Prioritize high-margin items
- Optimize stock levels
- Minimize overstock and low-yield inventory

## Final Deliverables

- SQL File: superstore\_retail.sql
- Python Notebook (PDF): superstore\_retail.ipynb - Colab.pdf
- Interactive Dashboard: superstore\_retail.twbx