# Retail Business Performance & Profitability Analysis

## Introduction

In today's competitive retail environment, understanding profitability, optimizing inventory turnover, and identifying seasonal trends are critical for business sustainability. This project aims to analyze transactional retail data to uncover profit-draining categories, improve inventory management, and enhance strategic decision-making through data visualization and actionable insights.

## Abstract

This project explores retail transaction data to evaluate product profitability, inventory performance, and seasonal product behavior. Using SQL for data extraction and transformation, Python for analytical modeling, and Tableau for visual storytelling, the project highlights underperforming categories and offers strategic suggestions. The end goal is to support data-driven decisions that reduce costs and boost profitability.

## Tools Used

- SQL – Data cleaning, profit margin computation, and categorical analysis
- Python (Pandas, Seaborn) – Correlation analysis and data preprocessing
- Tableau – Interactive dashboard for visual insights

## Steps Involved in Building the Project

## 1. Data Cleaning and Preparation

- Imported retail transaction data into SQL
- Removed duplicates and handled missing/null values

## 2. Profitability Analysis

- Calculated profit margins across product categories and sub-categories using SQL
- Ranked products based on profitability

## 3. Inventory Turnover Correlation

- Used Python (Pandas) to calculate average inventory days
- Applied correlation techniques to analyze the relationship between inventory days and profitability

## 4. Seasonal Trend Analysis

- Identified season-wise demand trends for products
- Highlighted key periods of peak and low sales

## 5. Dashboard Creation

Built an interactive Tableau dashboard with filters for:

- Region
- Product Category
- Seasonal Quarter

Integrated visuals for profit margins, stock levels, and seasonal trends

## 6. Strategic Recommendations

- Flagged slow-moving and overstocked items
- Suggested promotional strategies and restocking plans

## Key Insights:

**SLOW-MOVING ITEMS (High stock but not selling well & low profit)**

▶ Bookcases (Central Region – all seasons)

- Stop buying more for now
- Give big discounts to sell them faster
- Try selling them in combo offers with popular items like chairs or desks
- Check if customers don't like the design or quality

▶ Furnishings (Central Region – Autumn)

- Run clearance sales just in the Central region
- Avoid buying them again for next Autumn

- Sell in bulk to schools, offices, or other businesses

▶ Chairs (Central Region – Summer)

- Offer a small discount to increase sales
- Order fewer for the Summer in future

**OVERSTOCKED ITEMS (Too much in stock but still profitable)**

▶ Chairs (Central Region – Spring & Winter)

- No need to reduce price—just promote them more
- Suggest them with related items (e.g., office tables) to increase sales

▶ Art Supplies & Envelopes (Central Region)

- Sell in bulk to offices or schools
- Use them in offers like "free gift with purchase" or customer reward programs

# Conclusion:

This project demonstrates how integrated data tools can enhance retail business intelligence. By identifying unprofitable product categories, optimizing inventory turnover, and recognizing seasonal behavior, the project empowers stakeholders to make data-driven decisions that enhance both performance and profitability. The insights delivered through SQL queries, Python analysis, and Tableau dashboards offer a robust foundation for ongoing retail strategy improvements.