



Customer Shopping Behavior Analysis

This project analyzes customer shopping behavior using transactional data from 3,900 purchases. Our goal is to uncover insights into spending patterns, customer segments, product preferences, and subscription behavior to guide strategic business decisions.



Project Overview & Dataset Summary



Project Goal

Uncover insights into spending patterns, customer segments, product preferences, and subscription behavior.



Dataset Size

3,900 purchases, 18 columns of transactional data.



Key Features

Demographics, purchase details, shopping behavior (discounts, reviews, frequency).



Missing Data

37 values in the 'Review Rating' column were imputed using median ratings.

Exploratory Data Analysis in Python

Data Preparation & Cleaning

- **Data Loading:** Imported dataset using `pandas`.
- **Initial Exploration:** Used `df.info()` and `.describe()` for structure and summary statistics.
- **Missing Data Handling:** Imputed missing 'Review Rating' values with median by category.
- **Column Standardization:** Renamed columns to `snake_case`.
- **Feature Engineering:** Created `age_group` and `purchase_frequency_days`.
- **Data Consistency:** Dropped redundant `promo_code_used` column.
- **Database Integration:** Loaded cleaned data into PostgreSQL for SQL analysis.





Key SQL Analysis Findings



Revenue by Gender

Male customers generated **\$157,890**, Female customers **\$75,191**.



Top 5 Products by Rating

Gloves (3.86), Sandals (3.84), Boots (3.82), Hat (3.80), Skirt (3.78).



Shipping Type

Express shipping has a higher average purchase amount (**\$60.48**) than Standard (**\$58.46**).



Discount-Dependent Products

Hat (50%), Sneakers (49.66%), Coat (49.07%) show highest discount usage.

Customer Segmentation & Revenue Insights

Customer Segments

- 1

Loyal

3116 customers
- 2

Returning

701 customers
- 3

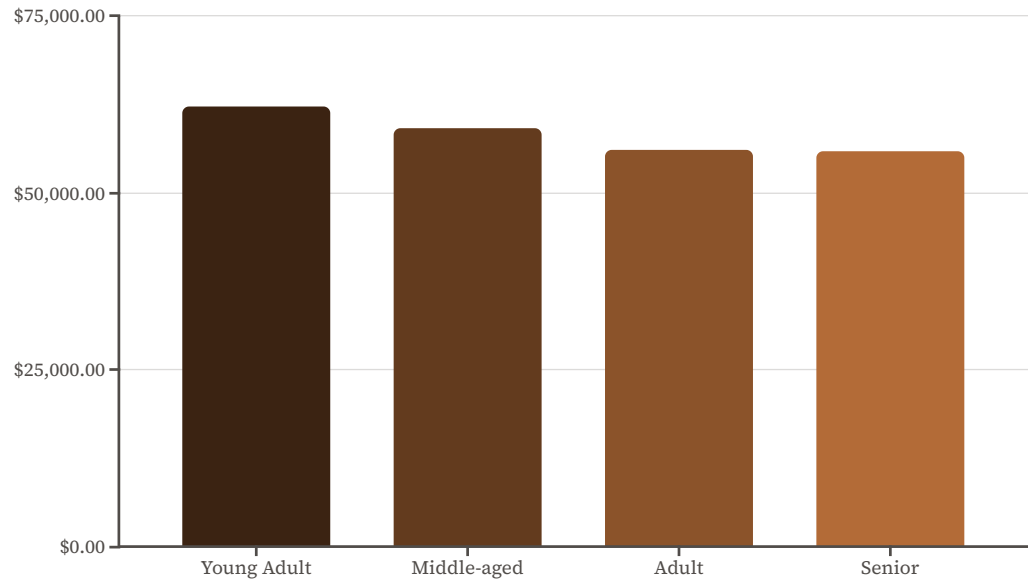
New

83 customers

Subscription Behavior

Repeat buyers (more than 5 purchases) are more likely to subscribe: 958 Yes vs. 2518 No.

Revenue by Age Group



Strategic Business Recommendations



Boost Subscriptions

Promote exclusive benefits to increase subscriber base.



Customer Loyalty Programs

Reward repeat buyers to foster loyalty and move them into the "Loyal" segment.



Review Discount Policy

Balance sales boosts with margin control for sustainable growth.



Product Positioning

Highlight top-rated and best-selling products in marketing campaigns.



Targeted Marketing

Focus efforts on high-revenue age groups and express-shipping users.