



Retail Customer Behavior Analysis

Leveraging shopping data to identify trends, improve customer engagement, and optimize marketing strategies through comprehensive data analysis.

The Challenge



Changing Patterns

Shifts in purchasing behavior across demographics, product categories, and sales channels.



Key Questions

Which factors drive consumer decisions and repeat purchases?



Business Goals

Improve sales, customer satisfaction, and long-term loyalty.



Project Approach

01

Data Preparation

Clean and transform raw dataset using Python

03

Visualization

Build interactive Power BI dashboard

02

SQL Analysis

Structure data and extract insights on customer segments

04

Insights & Recommendations

Deliver actionable business strategies



Dataset Overview

3,900

Total Purchases

Transactions analyzed

18

Data Points

Feature columns

Key Features Analyzed

- Customer demographics (Age, Gender, Location)
- Purchase details (Category, Amount, Season)
- Shopping behavior (Discounts, Reviews, Frequency)
- Subscription status and loyalty metrics

Data Preparation with Python

1

Data Loading & Exploration

Imported dataset using pandas, checked structure with `df.info()` and summary statistics.

2

Missing Data Handling

Imputed missing Review Rating values using median rating per product category.

3

Feature Engineering

Created age groups using `qcut()` and purchase frequency columns from raw data.

4

Database Integration

Connected to PostgreSQL and loaded cleaned data for SQL analysis.

Top-Rated Products

Jewelry

Average rating: 3.75

Handbag

Average rating: 3.75

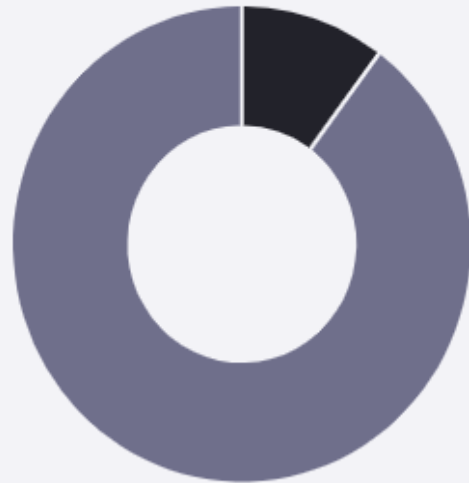
Dress

Average rating: 3.74

Shoes

Average rating: 3.74

Customer Segmentation Insights



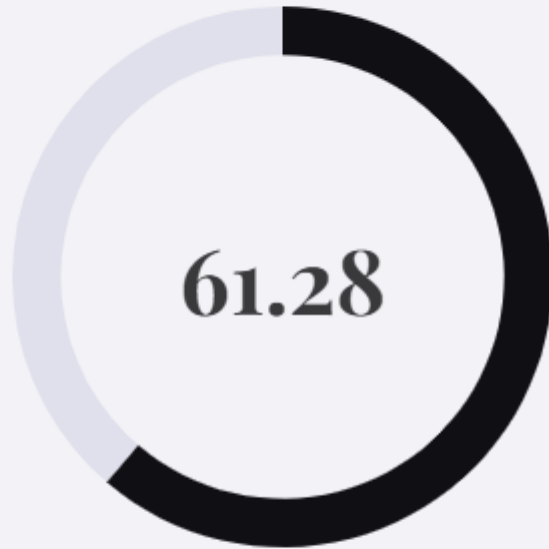
■ New ■ Returning

Segment Breakdown

90% of customers are returning buyers, showing strong retention. Focus on converting returning customers into loyal subscribers.

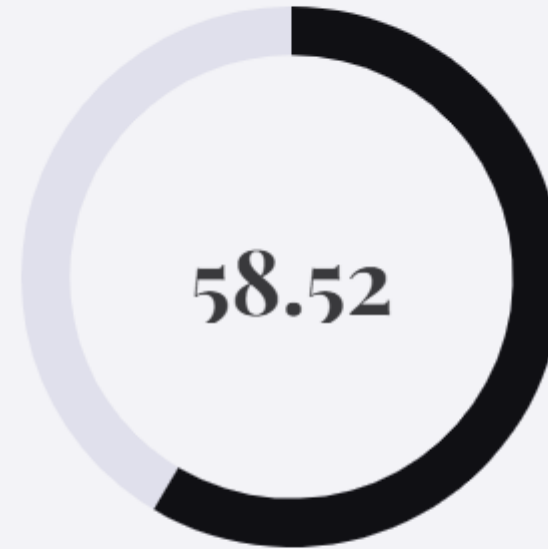
Key Finding: Repeat buyers with 5+ purchases show high subscription likelihood.

Subscription Impact



Average Spend

Subscribers spend \$61.28 on average



Non-Subscribers

Non-subscribers spend \$58.52 on average

Subscribed customers generate higher average purchase amounts and total revenue. Express shipping users also show elevated spending patterns compared to standard shipping.



Strategic Recommendations

Boost Subscriptions

Promote exclusive benefits to convert repeat buyers into subscribers.

Loyalty Programs

Reward returning customers to move them into the loyal segment.

Product Positioning

Highlight top-rated products like jewelry and handbags in campaigns.

Targeted Marketing

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