



# Customer Shopping Behavior Analysis

Insights from 3,900 Retail Transactions Across Product Categories

# Project Overview

## Our Mission

Analyze customer shopping behavior using transactional data from 3,900 purchases to uncover insights into spending patterns, customer segments, product preferences, and subscription behavior.

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### Data Exploration

Python analysis and cleaning

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### SQL Analysis

Business transactions queries

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### Visualization

Power BI dashboard creation

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### Recommendations

Strategic business insights



# Dataset at a Glance

**3,900**

## Total Transactions

Comprehensive purchase records analyzed

**18**

## Data Columns

Rich feature set for analysis

**4**

## Product Categories

Clothing, Accessories, Footwear, Outerwear

**50**

## Locations

Geographic diversity across states

# Data Preparation & Cleaning



## Data Loading

Imported dataset using pandas and performed initial exploration with `df.info()` and `.describe()` for summary statistics.



## Missing Data Handling

Imputed 37 missing values in Review Rating column using median rating of each product category.



## Database Integration

Connected Python to PostgreSQL and loaded cleaned DataFrame for SQL analysis.

## Feature Engineering

Created `age_group` column by binning customer ages and `purchase_frequency_days` from purchase data.

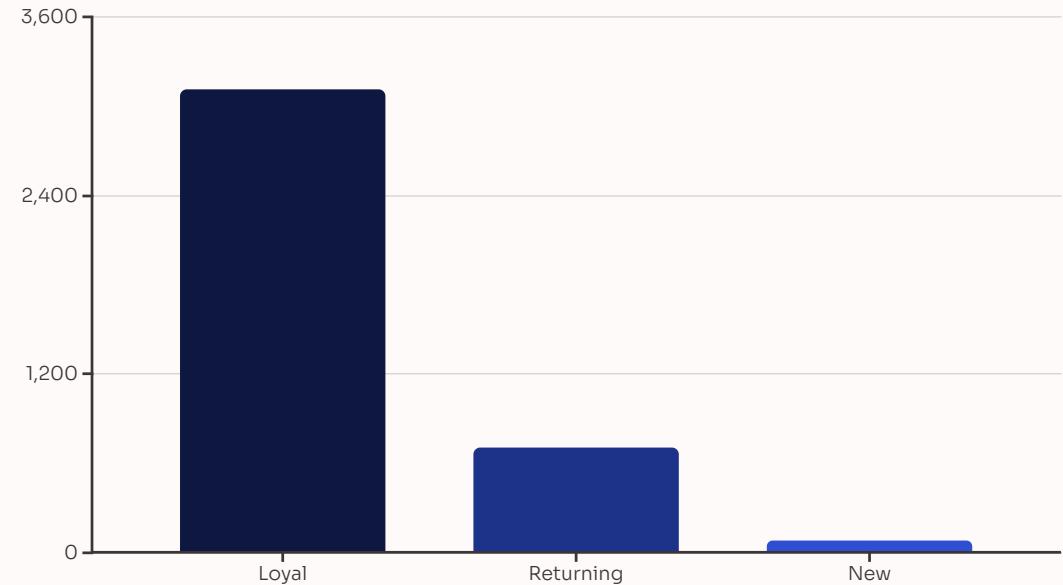
# Revenue & Customer Insights

Revenue by Gender



Male customers generate 68% of total revenue, representing a significant opportunity for targeted marketing.

Customer Segmentation



80% of customers are loyal, indicating strong retention but limited new customer acquisition.

# Product Performance Analysis



## Top Rated Products

1. Gloves (3.86)
2. Sandals (3.84)
3. Boots (3.82)
4. Hat (3.80)
5. Skirt (3.78)



## Best Sellers by Category

- Clothing: Blouse (171 orders)
- Accessories: Jewelry (171 orders)
- Footwear: Sandals (160 orders)
- Outerwear: Jacket (163 orders)

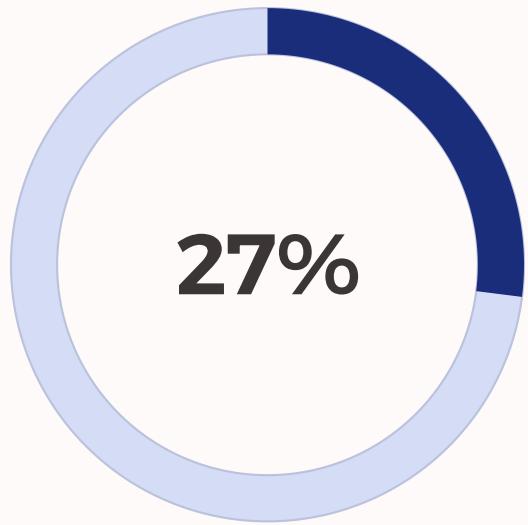


## Discount-Dependent Items

Hat (50%), Sneakers (49.66%), Coat (49.07%), Sweater (48.17%), and Pants (47.37%) show highest discount rates.

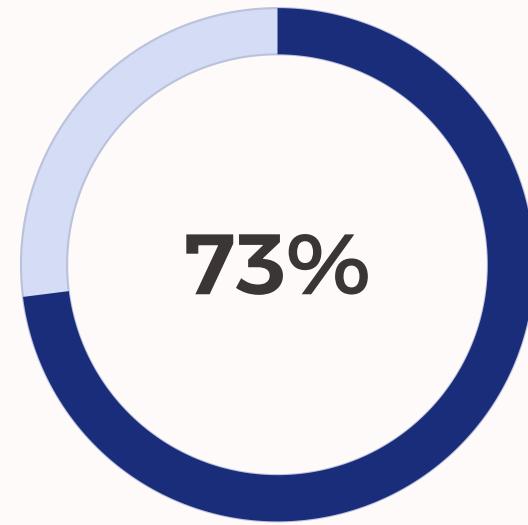


# Subscription & Loyalty Patterns



## Subscription Rate

1,053 customers with active subscriptions



## Non-Subscribers

2,847 customers without subscriptions

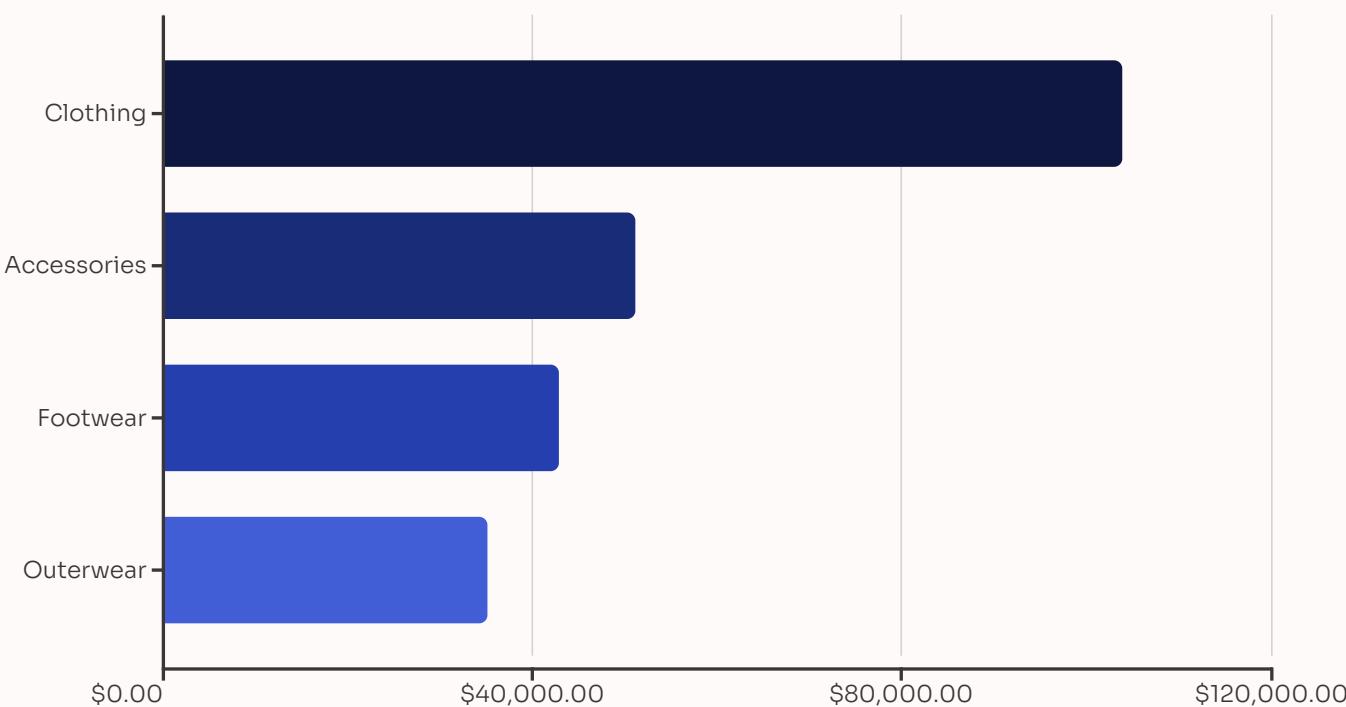
## Spending Comparison

Subscribers average **\$59.49** per purchase while non-subscribers spend **\$59.87**. Despite similar spending, subscribers generate \$62,645 total revenue vs. \$170,436 from non-subscribers.

## Repeat Buyer Insight

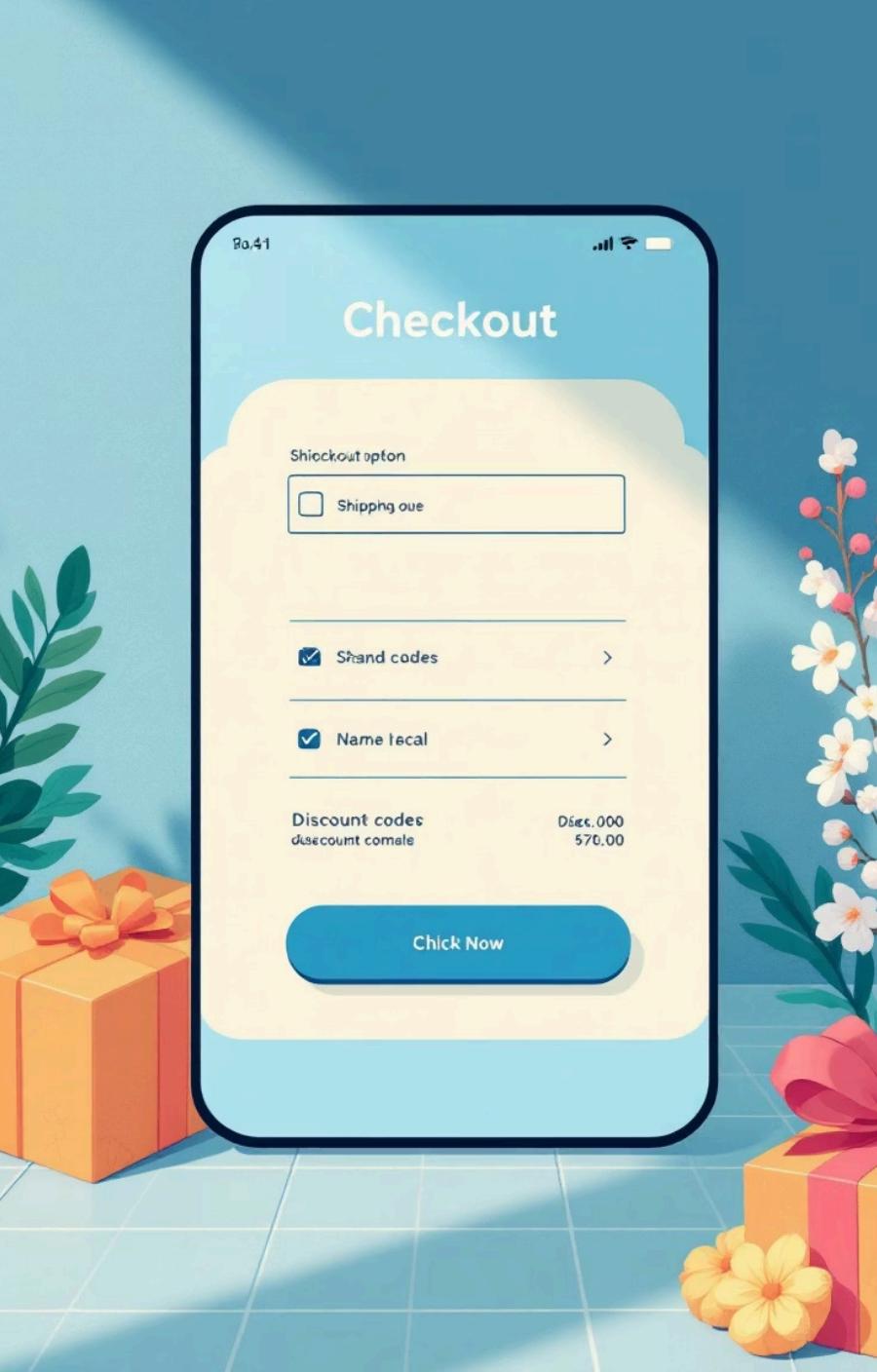
Among customers with 5+ purchases, 958 are subscribers while 2,518 are not—indicating significant untapped subscription potential.

# Revenue Distribution Analysis



## Category Performance

Clothing dominates with 45% of total revenue.  
Young adults are the highest-spending demographic across all categories.



# Shipping & Discount Behavior



## Express Shipping

Average purchase: **\$60.48**

Premium shipping correlates with slightly higher spending, suggesting price-insensitive customer segment.



## Standard Shipping

Average purchase: **\$58.46**

Most popular option with cost-conscious customers maintaining healthy purchase amounts.



## High-Value Discount Users

Multiple customers used discounts but still spent above the \$59.76 average, indicating discounts don't necessarily reduce basket size.

# Strategic Recommendations

## Boost Subscriptions

With 2,518 repeat buyers not subscribed, promote exclusive benefits to convert loyal customers into subscribers.

## Customer Loyalty Programs

Reward repeat buyers to accelerate movement from "Returning" to "Loyal" segment and increase lifetime value.

## Review Discount Policy

Balance sales boosts with margin control—high-value customers spend above average even with discounts applied.

## Product Positioning

Highlight top-rated products (Gloves, Sandals, Boots) and best-sellers (Blouse, Jewelry) in marketing campaigns.

## Targeted Marketing

Focus efforts on young adults and middle-aged customers, plus express-shipping users who demonstrate higher spending patterns.