Customer Shopping Behavior Analysis

Uncovering insights from 3,900 purchases to guide strategic business decisions through data-driven analysis of spending patterns, customer segments, and product preferences.

Understanding Our Data Foundation

3,900
Total Purchases
Transactions analyzed across all categories

18
Data Features
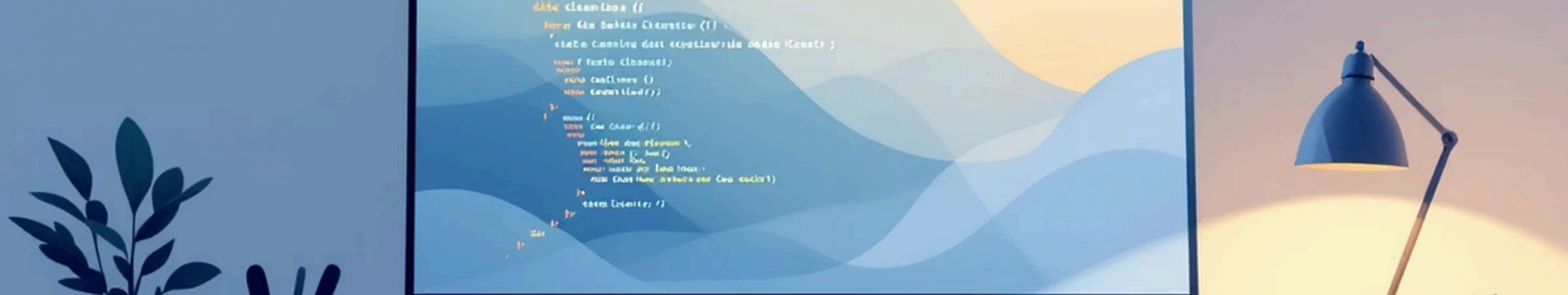Comprehensive customer and purchase attributes

50
Locations
Geographic diversity in customer base

25
Product Types
Diverse inventory across four categories

Dataset includes customer demographics, purchase details, and shopping behavior metrics. Only 37 missing values in Review Rating column, ensuring high data quality for analysis.

Python Data Cleaning & Engineering

01

Data Loading & Exploration

Imported dataset and performed initial structure analysis using pandas

02

Missing Data Handling

Imputed Review Rating nulls using median rating per product category

03

Feature Engineering

Created age_group bins and purchase_frequency_days columns

04

Database Integration

Connected to PostgreSQL and loaded cleaned data for SQL analysis

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Revenue Analysis by Gender

Male ■ Female ■
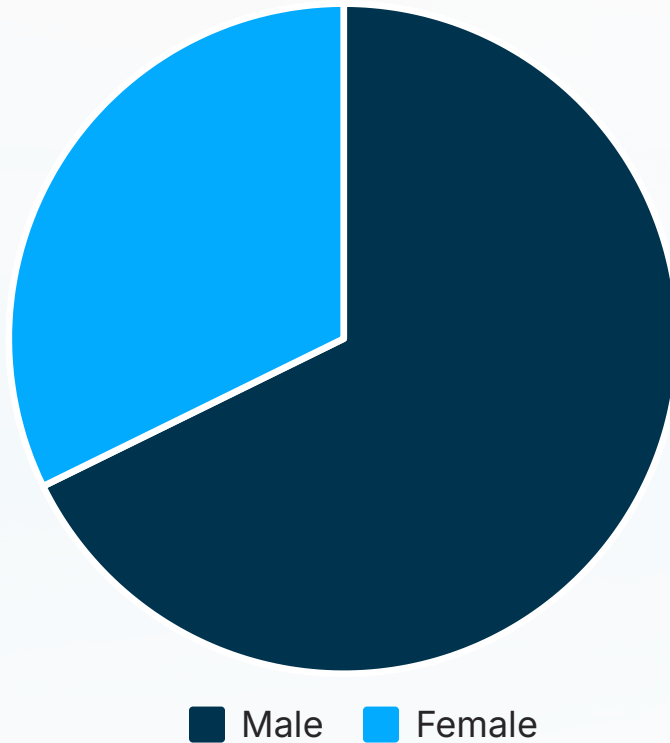
Male Customers Drive Revenue

Male customers generate $157,890 in total revenue compared to $75,191 from female customers—representing 68% of total sales.

This significant disparity suggests opportunities for targeted marketing campaigns to increase female customer engagement and spending.

Product Excellence & Customer Preferences

Highest-Rated Products

77%	77%	76%

Gloves

3.86 average rating

Sandals

3.84 average rating

Boots

3.82 average rating
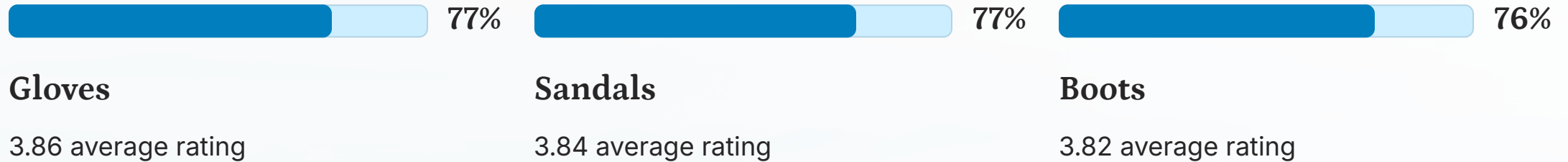
Discount-Dependent Items

- **Hat:** 50% of purchases use discounts
- **Sneakers:** 49.66% discount rate
- **Coat:** 49.07% discount rate
- **Sweater:** 48.17% discount rate

These products may benefit from strategic pricing adjustments to improve margins.

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Customer Segmentation Insights

Loyal Customers

3,116 customers

80% of customer base with strong repeat purchase behavior

Returning Buyers

701 customers

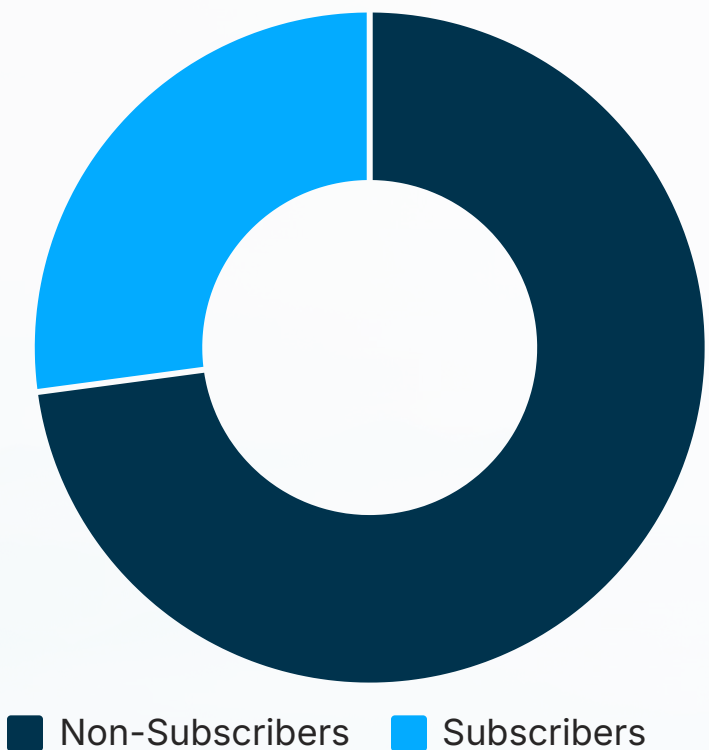18% showing positive engagement and growth potential

New Customers

83 customers

2% representing fresh acquisition opportunities

Subscription Status Analysis

Despite similar average spending patterns, subscribers represent only 27% of the customer base but show strong loyalty indicators.
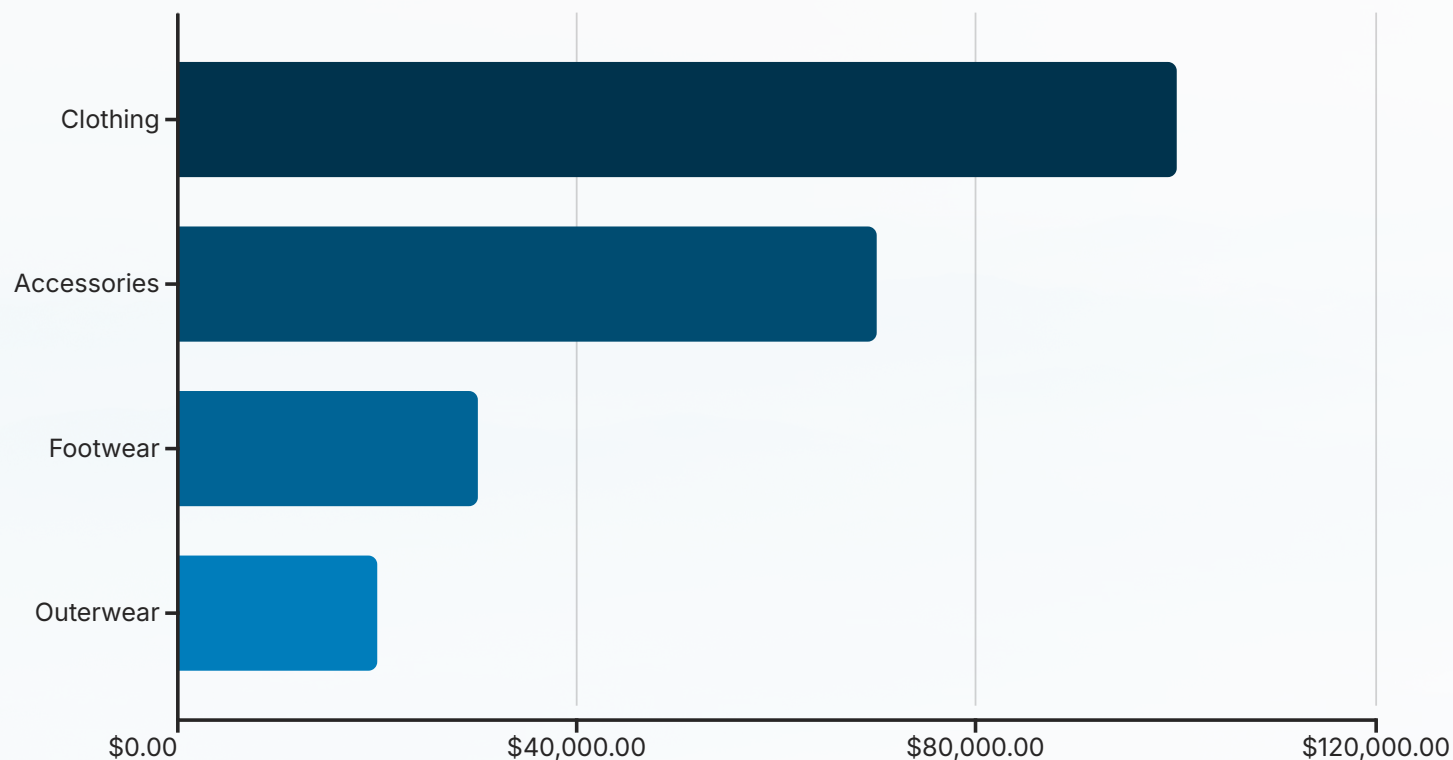

■ Non-Subscribers ■ Subscribers

Subscribers

1,053 customers

$59.49 avg spend

$62,645 total revenue

Non-Subscribers

2,847 customers

$59.87 avg spend

$170,436 total revenue

Category & Age Group Performance

Age Group Contributions

- **Young Adult:** $62,143 revenue
- **Middle-aged:** $59,197 revenue
- **Adult:** $55,978 revenue
- **Senior:** $55,763 revenue

Clothing dominates revenue at $100K. Young adults lead spending, suggesting targeted campaigns for this demographic.

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Power BI Dashboard Highlights

3.9K
Total Customers

Comprehensive customer base analyzed

$59.76
Avg Purchase

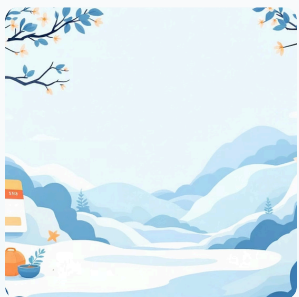Consistent spending across segments

3.75
Avg Rating

Strong customer satisfaction scores

Interactive dashboard enables real-time filtering by subscription status, gender, category, and shipping type—providing stakeholders with actionable insights for strategic decision-making.

Strategic Business Recommendations

Boost Subscriptions

Promote exclusive benefits to convert the 73% non-subscriber base

Loyalty Programs

Reward repeat buyers to strengthen the 80% loyal customer segment

Review Discounts

Balance promotional sales with margin control for high-discount products

Targeted Marketing

Focus on high-revenue young adults and express-shipping users

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