Customer Behavior Data Analysis

Using Python, SQL, and Power BI

Project Objective

Analyze Behavior

Understand customer shopping patterns.

Data-Driven Decisions

Improve sales, retention, and marketing.

Dataset Overview

Customer Shopping Behavior

- 3,900 customer records
- 18 attributes

Key attributes: Purchase Amount, Category, Location, Age, Subscription Status.

Data Issues & Tools

Identified Issues

- Missing values: Review Rating (37 records)
- No duplicate rows
- Categorical standardization needed

Tools Used

- Python: Cleaning, exploration, analysis
- SQL: Querying, filtering, aggregation
- Power BI: Interactive dashboards, visualization

Data Cleaning with Python

01

Load Dataset

Using pandas for initial import.

02

Check Data

Shape, types, missing values, duplicates.

03

Handle Missing Values

Replacing null values with the **median review rating**

04

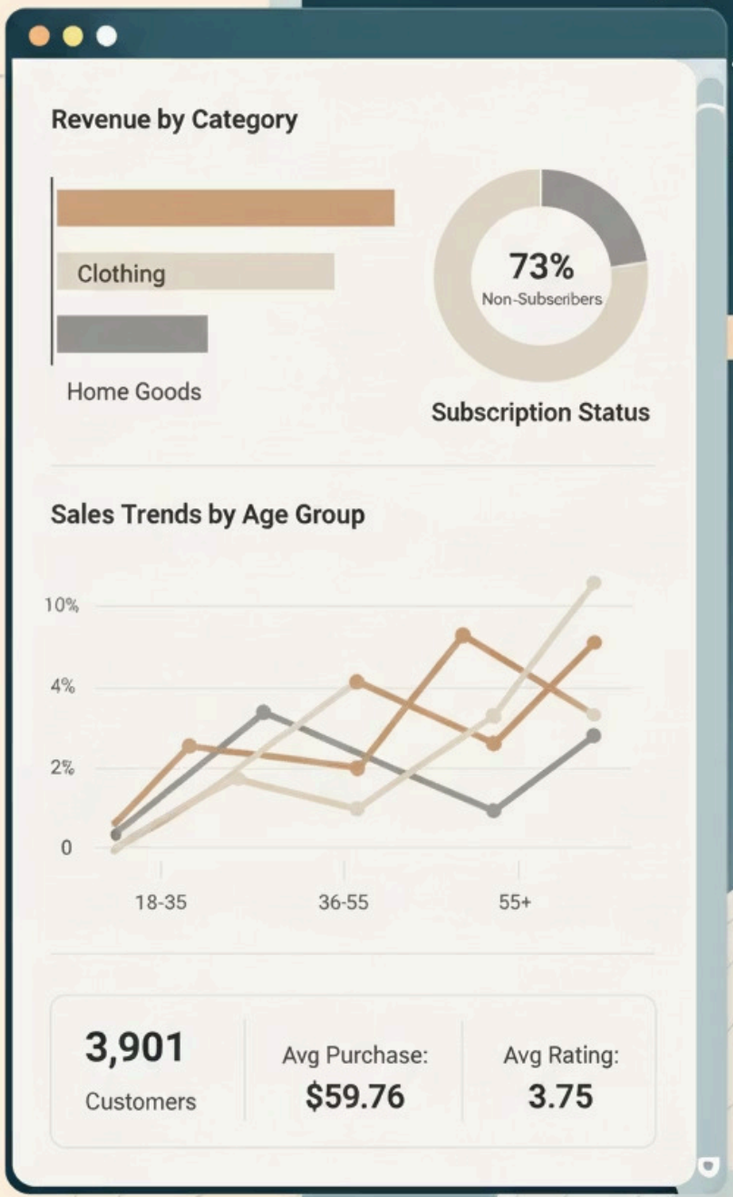
Standardize Columns

Renamed for analysis-friendly format.

05

Add Age_Group

Segmented customers for deeper analysis.



SQL Analysis: Key Business Questions

1

Total Customers

3,901 records.

2

Avg. Purchase Amount

~$59-$60.

3

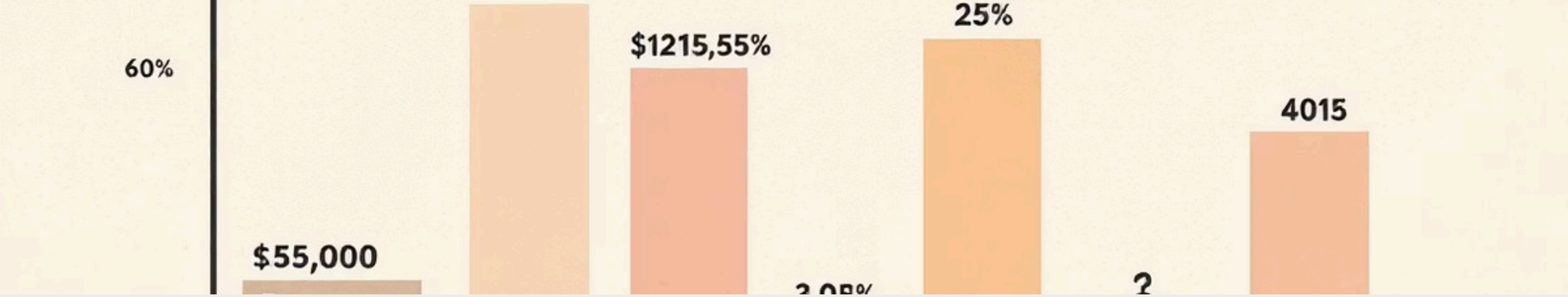
Avg. Review Rating

~3.7-3.8.

4

Subscription Status

Majority non-subscribers.



SQL Analysis: Revenue & Sales

1

Revenue by Category

Clothing generates highest revenue.

2

Sales by Age Group

Young Adults lead purchases.

3

High-Value Customers

Customers spending above average.

Power BI Dashboard

Key Performance Indicators

- Total Customers: 3.9K
- Avg. Review Rating: 3.75
- Avg. Purchase Amount: $59.76

Interactive Visuals

- Subscription status percentage
- Revenue/Sales by category & age group
- Filters: Subscription, Gender, Category, Shipping

Key Insights & Recommendations

Non-Subscribers

73% of customers.

Clothing Dominates

Highest revenue & sales.

Young Adult Impact

Highest revenue contribution.

Boost Subscriptions

Discounts & loyalty programs.

Target Young Adults

Personalized offers.

Conclusion

Python, SQL, and Power BI empower data-driven decisions.

1. **Improve Decision-Making**
2. **Increase Revenue**
3. **Enhance Customer Experience**