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

Data-Driven Insights

Leveraging 3,900 purchase records to understand customer behavior.

Strategic Decision Making

Guiding business strategies through analysis of spending patterns and preferences.

Key Focus Areas

Customer segments, product preferences, and subscription behavior.

Dataset Summary

Our dataset comprises 3,900 rows and 18 columns, offering a comprehensive view of customer interactions.

- **Rows:** 3,900
- **Columns:** 18

Key Features include:

- Customer demographics (Age, Gender, Location, Subscription Status)
- Purchase details (Item, Category, Amount, Season, Size, Color)
- Shopping behavior (Discount, Promo Code, Previous Purchases, Frequency, Review Rating, Shipping Type)

Missing Data: 37 values in the Review Rating column were identified and addressed during cleaning.

Exploratory Data Analysis (EDA) with Python

Our EDA process in Python involved several critical steps to ensure data quality and readiness for analysis.

01

Data Loading & Initial Exploration

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

02

Missing Data Handling

Identified null values and imputed missing 'Review Rating' using the median rating per product category.

03

Column Standardization

Renamed columns to snake_case for improved readability and documentation.

04

Feature Engineering

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

05

Data Consistency Check

Verified and dropped redundant 'promo_code_used' column.

06

Database Integration

Loaded the cleaned DataFrame into PostgreSQL for subsequent SQL analysis.

Data Analysis with SQL: Key Business Questions

Structured analysis in PostgreSQL provided answers to critical business questions, revealing key trends in customer behavior.

1

Revenue by Gender

Compared total revenue generated by male vs. female customers.

2

High-Spending Discount Users

Identified customers who used discounts but still spent above average.

3

Top 5 Products by Rating

Found products with the highest average review ratings.

4

Shipping Type Comparison

Compared average purchase amounts between Standard and Express shipping.

5

Subscribers vs. Non-Subscribers

Compared average spend and total revenue across subscription statuses.

SQL Insights: Product & Customer Deep Dive

Further SQL analysis delved into product performance and customer segmentation, providing actionable insights.

1

Discount-Dependent Products

Identified 5 products with the highest percentage of discounted purchases.

2

Customer Segmentation

Classified customers into New, Returning, and Loyal segments based on purchase history.

3

Top 3 Products per Category

Listed the most purchased products within each category.

4

Repeat Buyers & Subscriptions

Checked if customers with >5 purchases are more likely to subscribe.

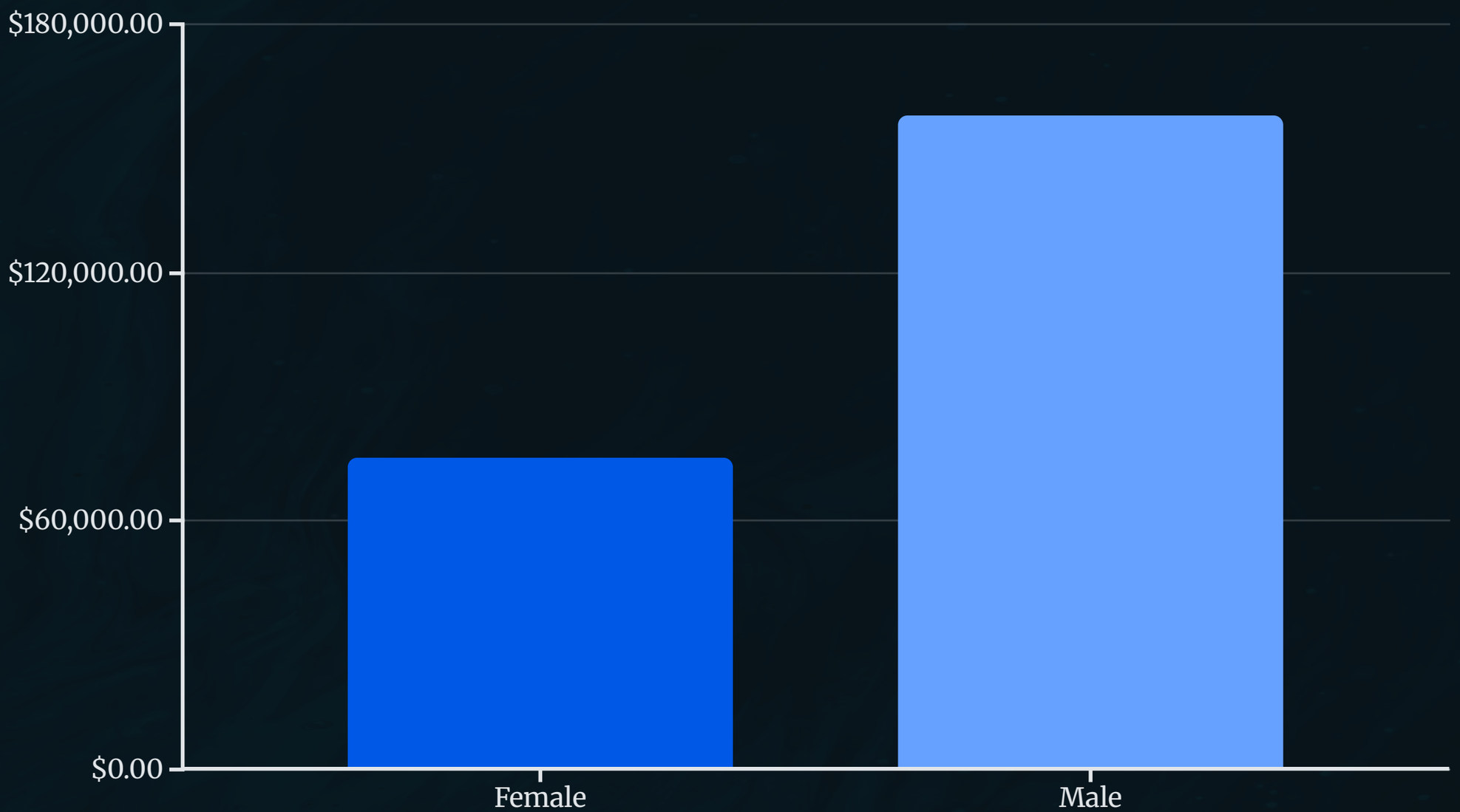
5

Revenue by Age Group

Calculated total revenue contribution of each age group.

Revenue by Gender

Our analysis reveals a significant difference in revenue contribution between male and female customers.



Male customers generated significantly higher revenue compared to female customers, indicating a potential area for targeted marketing strategies towards female demographics.

Top 5 Products by Rating & Shipping Type Comparison

Top 5 Products by Average Rating

Item Purchased	Average Rating
Gloves	3.86
Sandals	3.84
Boots	3.82
Hat	3.80
Skirt	3.78

Gloves and Sandals lead with the highest average review ratings, indicating strong customer satisfaction.

Shipping Type Comparison

Shipping Type	Average Purchase
Standard	58.46
Express	60.48

Customers using Express shipping tend to have slightly higher average purchase amounts.

Dashboard in Power BI

An interactive dashboard was built in Power BI to visually present these insights, allowing for dynamic exploration of the data.

This dashboard serves as a powerful tool for stakeholders to understand customer behavior at a glance and make informed decisions.

Business Recommendations

Based on our comprehensive analysis, we propose the following strategic recommendations:

→ Boost Subscriptions

Promote exclusive benefits to increase subscriber base and recurring revenue.

→ Customer Loyalty Programs

Implement programs to reward repeat buyers and foster loyalty, moving them into the "Loyal" segment.

→ Review Discount Policy

Strategically balance sales boosts from discounts with maintaining healthy profit margins.

→ Product Positioning

Highlight top-rated and best-selling products in marketing campaigns to capitalize on proven popularity.

→ Targeted Marketing

Focus marketing efforts on high-revenue age groups and express-shipping users for maximum impact.