



Customer Shopping Behavior Analysis

Uncovering insights for strategic business decisions.



Project Overview

Goal

Analyze 3,900 purchases to optimize operations.

Focus

Spending patterns, segments, preferences, subscriptions.

Outcome

Guide strategic business decisions.

Dataset Summary

3,900

Rows

Total purchases
analyzed.

18

Columns

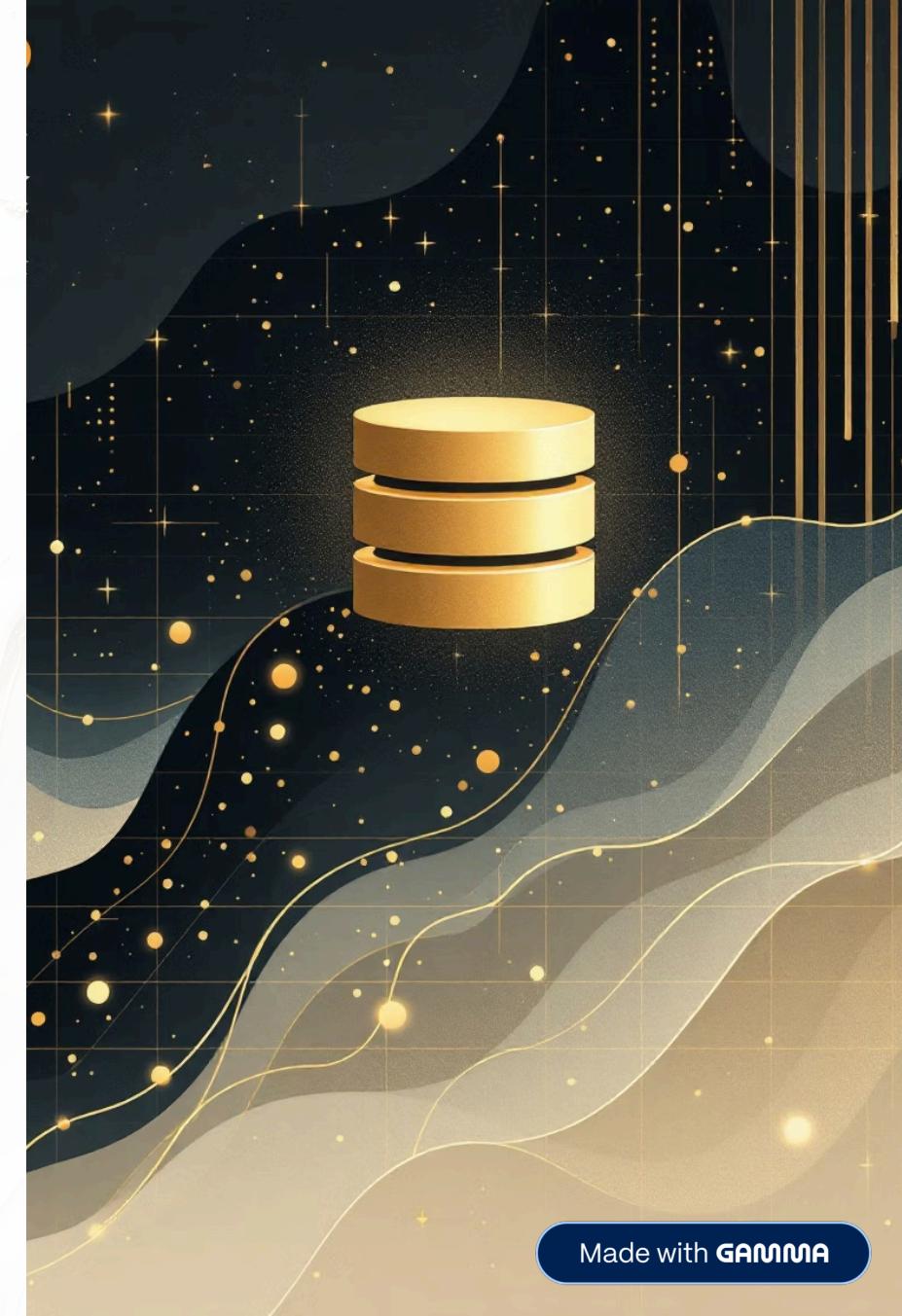
Features for deep
analysis.

37

Missing Values

In Review Rating
column.

Key features include demographics, purchase details, and shopping behavior.



ping_behavior.csv")

Location	Size	Color	Season	Rev Rate
Kentucky	L	Gray	Winter	
Maine	L	Maroon	Winter	
Massachusetts	S	Maroon	Spring	
Rhode Island	M	Maroon	Spring	
Oregon	M	Turquoise	Spring	

Exploratory Data Analysis (Python)

01

Loading Dataset

Imported CSV, previewed with df.head().

02

Initial Exploration

df.info() for structure, .describe() for stats.

03

Missing Data

Imputed Review Rating with median by category.

04

Column Standardization

Renamed to snake case for readability.

Feature Engineering & Integration

Feature Engineering

- Created age_group column.
- Calculated purchase_frequency_days.
- Dropped redundant promo_code_used.

Database Integration

- Connected Python to PostgreSQL.
- Loaded cleaned DataFrame for SQL analysis.

SQL Analysis: Key Business Insights

1

Revenue by Gender

Male: \$157,890, Female: \$75,191.

2

High-Spending Discount Users

Identified customers above average spend.

3

Top 5 Products by Rating

Gloves (3.86), Sandals (3.84), Boots (3.82), Hat (3.80), Skirt (3.78).



SQL Analysis: Shipping & Subscriptions



Shipping Type

Express: \$60.48 avg,
Standard: \$58.46 avg.



Subscribers vs. Non-Subscribers

Subscribers: \$62,645 total revenue.



Discount-Dependent Products

Hat (50%), Sneakers (49.66%), Coat (49.07%), Sweater (48.17%),
Pants (47.37%).



SQL Analysis: Segmentation & Loyalty

Loyal
3116 customers.

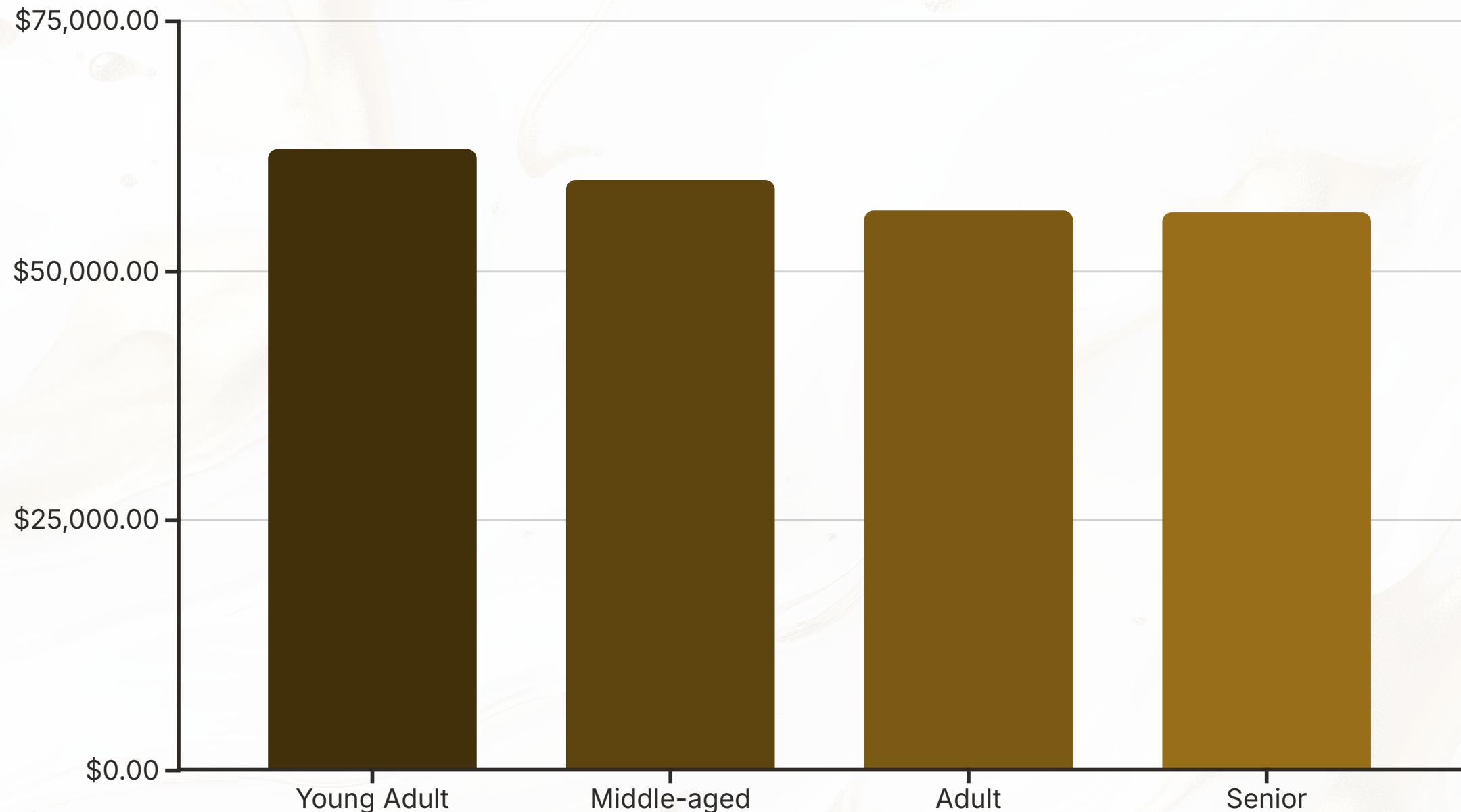
New
83 customers.

Repeat Buyers & Subscriptions
958 repeat buyers are subscribers.

Returning
701 customers.

	item_rank bigint	category text	item_purchased text	total_orders bigint
1	1	Accessori...	Jewelry	171
2	2	Accessori...	Sunglasses	161
3	3	Accessori...	Belt	161
4	1	Clothing	Blouse	171
5	2	Clothing	Pants	171
6	3	Clothing	Shirt	169
7	1	Footwear	Sandals	160
8	2	Footwear	Shoes	150
9	3	Footwear	Sneakers	145
10	1	Outerwear	Jacket	163
11	2	Outerwear	Coat	161

Revenue by Age Group



Young Adults contribute the highest revenue.

Business Recommendations



Boost Subscriptions

Promote exclusive benefits.



Customer Loyalty

Reward repeat buyers.



Review Discount Policy

Balance sales with margin.



Product Positioning

Highlight top-rated items.



Targeted Marketing

Focus on high-revenue groups.

Customer Behavior Dashboard

Subscription Status
No
Yes

Gender
Female
Male

Category
Accessories
Clothing
Footwear
Outerwear

Shipping Type
<input type="checkbox"/> 2-Day Shipping
<input type="checkbox"/> Express
<input type="checkbox"/> Free Shipping
<input type="checkbox"/> Next Day Air
<input type="checkbox"/> Standard
<input type="checkbox"/> Store Pickup

3900

Number of Customer

\$59.76

Average Purchase Amount

3.75

Average Review Rating

