

**DATA**  
Modern technology

# Customer Shopping Behavior Analysis

Uncovering insights from transactional data to guide strategic business decisions.

# Project Overview

## Goal

Optimize operations, reduce costs, and improve forecasting.

## Data

3,900 purchases across various product categories.

## Insights

Spending patterns, customer segments, product preferences, subscription behavior.







# Dataset Summary

## Key Features

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

## Data Overview

- Rows: 3,900
- Columns: 18
- Missing Data: 37 values in Review Rating

iStock  
Credit: Anadmis

# Exploratory Data Analysis (Python)

01

## Data Loading & Exploration

Imported dataset, checked structure and summary statistics.

02

## Missing Data Handling

Imputed missing Review Ratings using median per category.

03

## Column Standardization

Renamed columns to snake\_case for readability.

04

## Feature Engineering

Created age\_group and purchase\_frequency\_days.

05

## Database Integration

Loaded cleaned data into PostgreSQL for SQL analysis.

# Data Analysis (SQL)

1

## Revenue by Gender

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

2

## High-Spending Discount Users

839 customers identified.

3

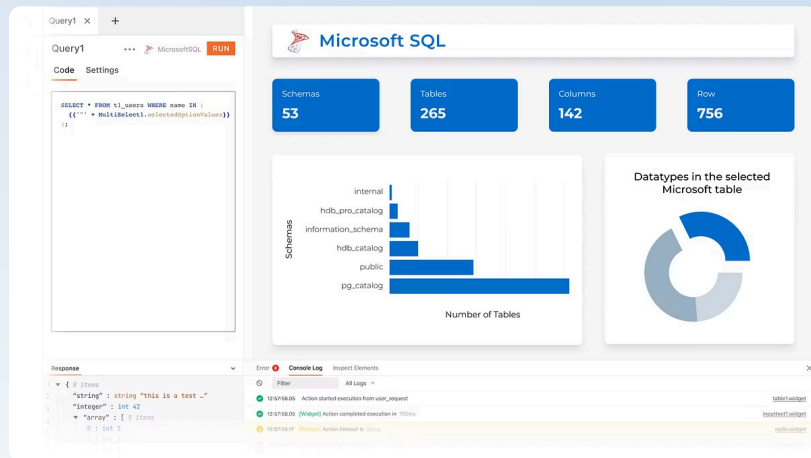
## Top 5 Products by Rating

Gloves (3.86), Sandals (3.84), Boots (3.82).

4

## Shipping Type Comparison

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



# SQL Insights: Subscriptions & Discounts

## Subscribers vs. Non-Subscribers

Yes	1053	59.49	62645.00
No	2847	59.87	170436.00

## Discount-Dependent Products

- Hat: 50%
- Sneakers: 49.66%
- Coat: 49.07%
- Sweater: 48.17%
- Pants: 47.37%

# Customer Segmentation

## Loyal

3,116 Customers

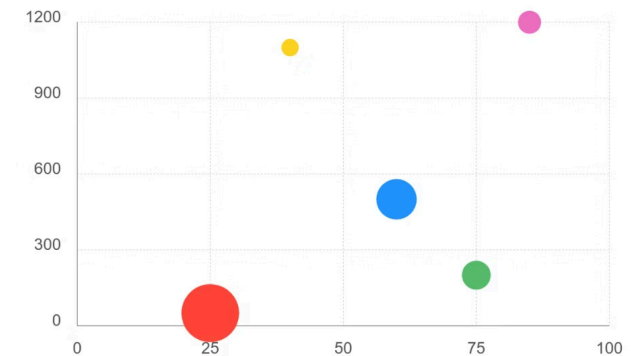
## Returning

701 Customers

## New

83 Customers

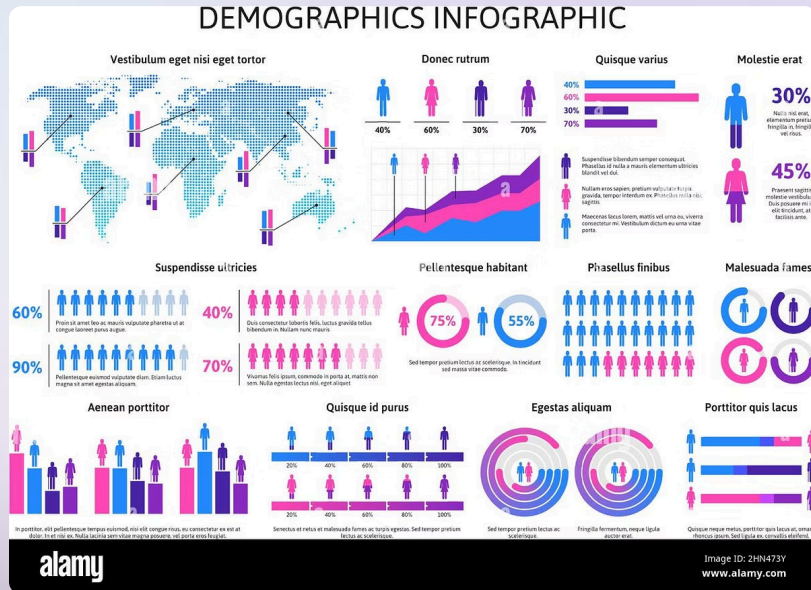
Customer Segmentation:  
Engagement vs. Value Analysis



# Top Products by Category

1	Accessories	Jewelry	171
1	Clothing	Blouse	171
1	Footwear	Sandals	160
1	Outerwear	Jacket	163





# Repeat Buyers & Revenue by Age

## Repeat Buyers & Subscriptions

Customers with >5 purchases:

- No Subscription: 2,518
- Yes Subscription: 958

## Revenue by Age Group

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

# Business Recommendations

## → **Boost Subscriptions**

Promote exclusive benefits.

## → **Customer Loyalty Programs**

Reward repeat buyers.

## → **Review Discount Policy**

Balance sales with margin control.

## → **Product Positioning**

Highlight top-rated products.

## → **Targeted Marketing**

Focus on high-revenue age groups and express-shipping users.