

Customer Shopping Behaviour Analysis

An End-to-End Data Analysis Case Study Using Python, SQL & Power BI Prepared by: **Sumit Arora** | Data Analyst | Chandigarh, India

LinkedIn : <https://www.linkedin.com/in/sumitarora3011/> | Email : sumit.duple8943@gmail.com

Project Overview

This project delivers an in-depth analysis of customer shopping behavior using transactional data from **3,900 records**. We explore customer demographics, purchase patterns, and subscription trends to generate actionable insights.

Key Objectives

- Identify high-value customer segments
- Understand spending habits and patterns
- Recommend data-driven business strategies



Dataset at a Glance

3,900

Total Records

Comprehensive transactional data

18

Data Columns

Covering demographics and behavior

37

Missing Values

Only in Review Rating column

Key Attributes Analyzed

Demographics

Age, Gender, Location, Subscription Status

Purchase Details

Item, Category, Amount, Season, Size, Color

Shopping Behavior

Discount, Promo Code, Review Rating, Shipping Type

Data Preparation & Cleaning

The dataset was cleaned and prepared using Python's pandas library. Missing values were handled, columns standardized, and new features engineered to capture behavioral patterns effectively.

01

Data Import & Inspection

Loaded CSV and examined structure with info() and describe()

02

Missing Value Treatment

Filled Review Rating nulls with median values

03

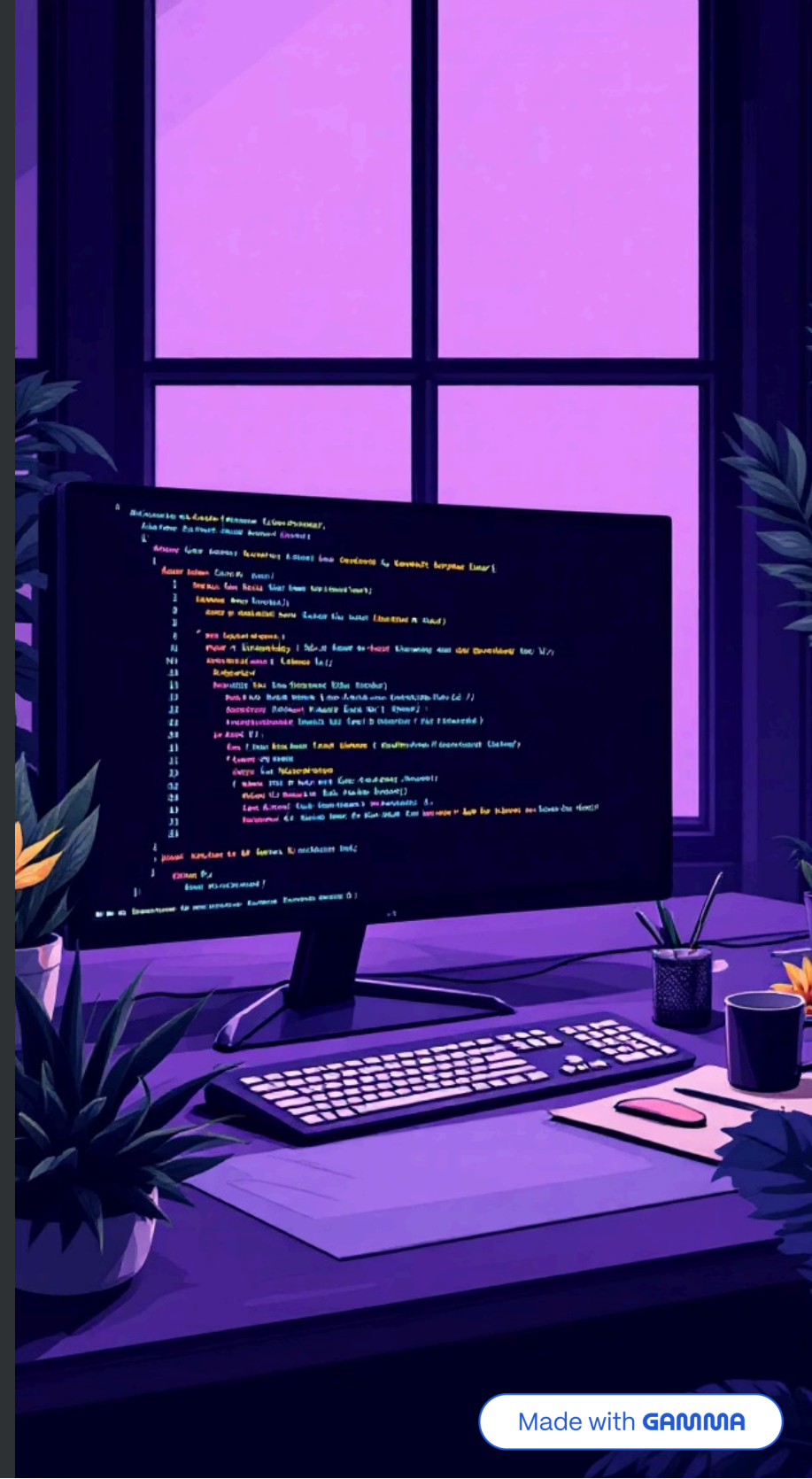
Column Standardization

Converted to lowercase and replaced spaces with underscores

04

Feature Engineering

Created age_group and purchase_frequency_days variables

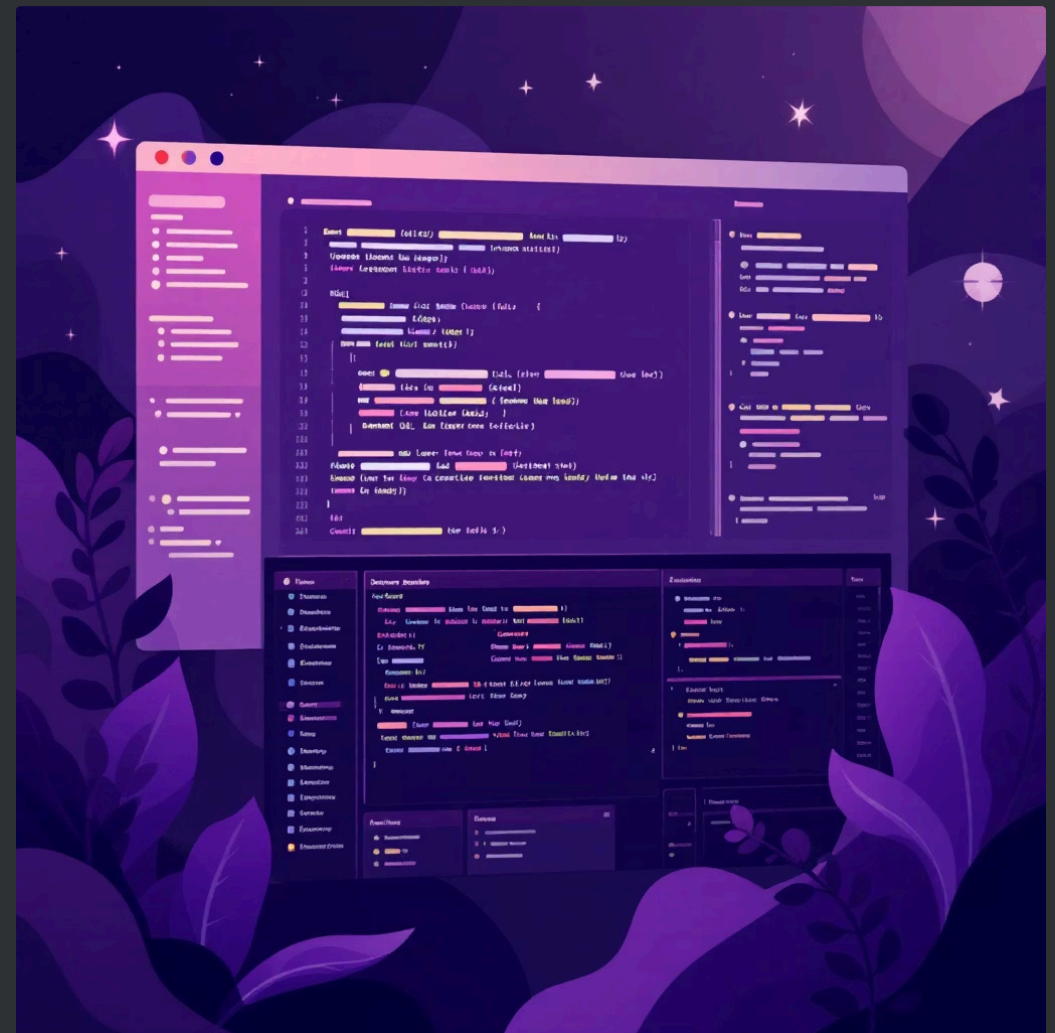


SQL-Based Business Analysis

The cleaned dataset was loaded into **PostgreSQL** for structured analysis. SQL queries answered critical business questions about revenue patterns, subscriber impact, and discount effectiveness.

Key Analysis Areas

- Gender-based revenue contribution
- Subscriber vs non-subscriber comparison
- Discount effectiveness analysis
- High-spending customer identification



Example:

-- Revenue by Gender

```
SELECT gender, SUM(purchase_amount) AS revenue
FROM customer_data
GROUP BY gender;
```

Power BI Dashboard

The Power BI dashboard provides a comprehensive visual summary of key metrics and customer trends, enabling stakeholders to interpret preferences and identify actionable opportunities.

KPI Tracking

Average purchase value, review ratings, and subscription metrics

Trend Analysis

Customer preferences and behavioral patterns over time

Segment Insights

Demographic breakdowns and category performance

CUSTOMER BEHAVIOUR DASHBOARD

Gender

Female

Male

Subscription

No

Yes

\$59.76

Average Purchase

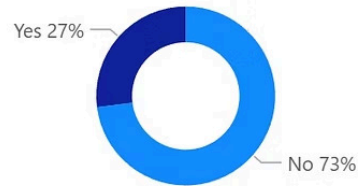
3.75

Average review

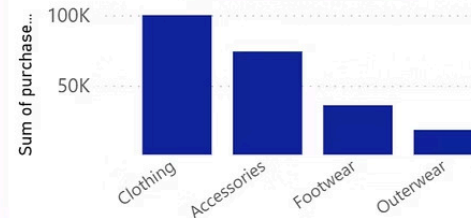
3.9K

Total User

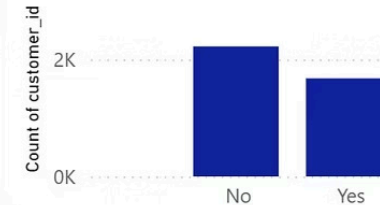
Subscription



Category wise Purchase



Discount Interested

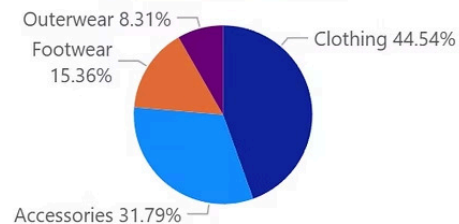


frequency_of_purchases Count of customer_id

Weekly	539
Quarterly	563
Monthly	553
Fortnightly	542
Every 3 Months	584
Bi-Weekly	547
Annually	572

Total 3900

Category Wise Shipping



Key Business Insights



Gender Revenue Gap

Male customers generated nearly **twice the revenue** of female customers



Non-Subscriber Dominance

73% of customers were non-subscribers, contributing majority of revenue



Category Leaders

Clothing was most popular, followed by accessories

Performance Metrics

\$59.76

Average Purchase
Per transaction value

3.75

Review Score
Out of 5 stars

73%

Non-Subscribers
Of total customer base



Strategic Recommendations



Target Non-Subscribers

Implement loyalty and retention programs for high-spending non-subscribers to increase lifetime value



Seasonal Campaigns

Promote targeted campaigns for top categories: Clothing and Accessories during peak seasons



Improve Satisfaction

Analyze review patterns to identify pain points and enhance customer experience

Tools & Skills Demonstrated

Technical Stack



Python & Pandas

Data cleaning and feature engineering



SQL (PostgreSQL)

Structured querying and analysis



Power BI

Visualization and dashboarding

Core Competencies

Data Cleaning • Feature Engineering • SQL Querying •
Business Intelligence • Visualization • Insight
Communication



Sumit Arora

Data Analyst | Chandigarh, India

[LinkedIn Profile](#)

sumit.duple8943@gmail.com