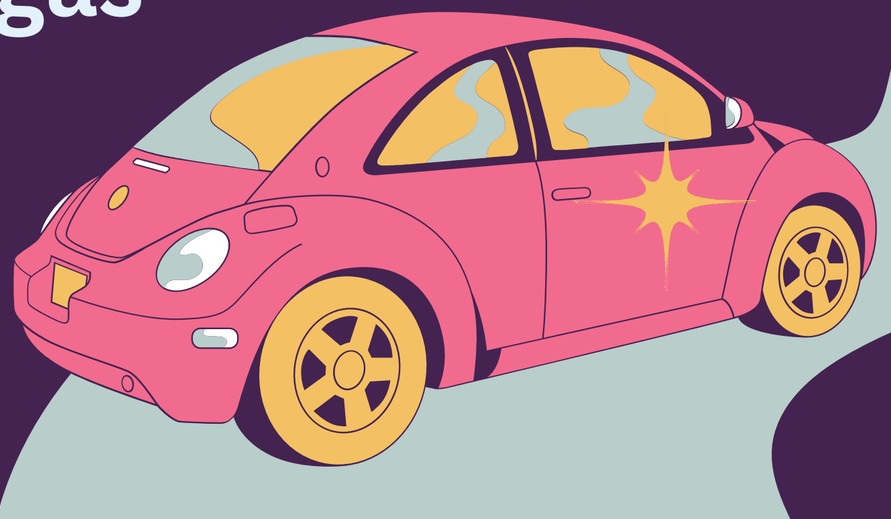
# Product Recommended Engine

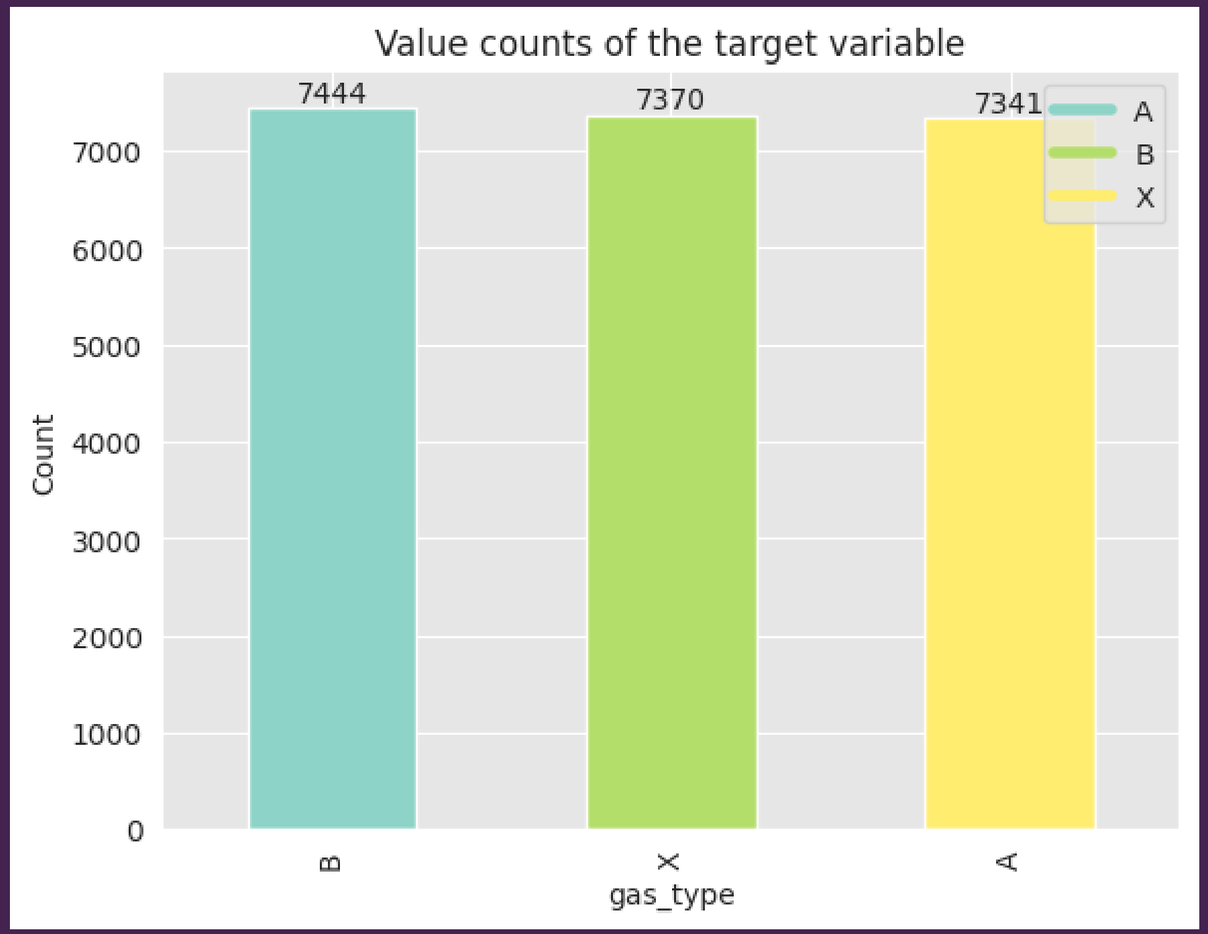
Presented by: Group3, ISE

# What we need to do

Build a recommendation Machine Learning Model to suggest the product when customers visit a gas station.

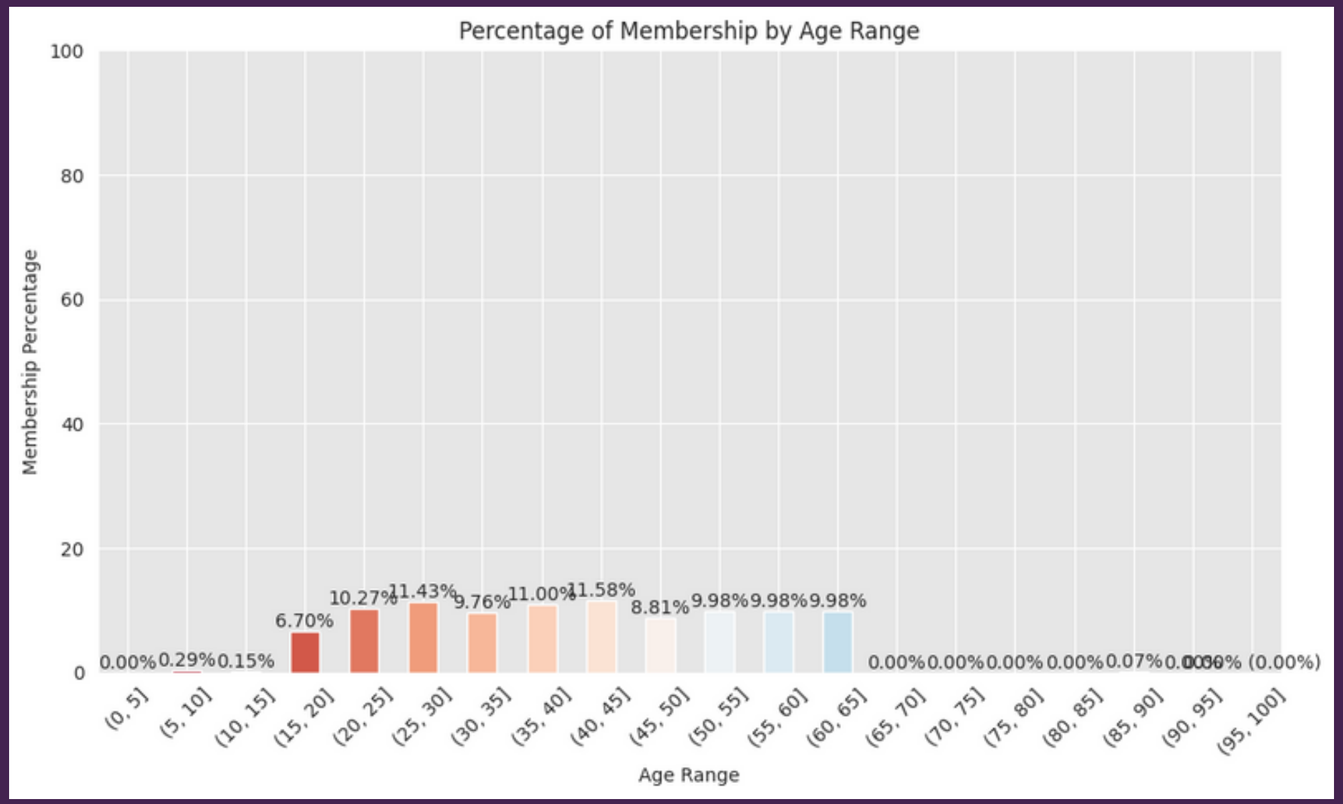


# Exploratory Data Analysis (EDA)



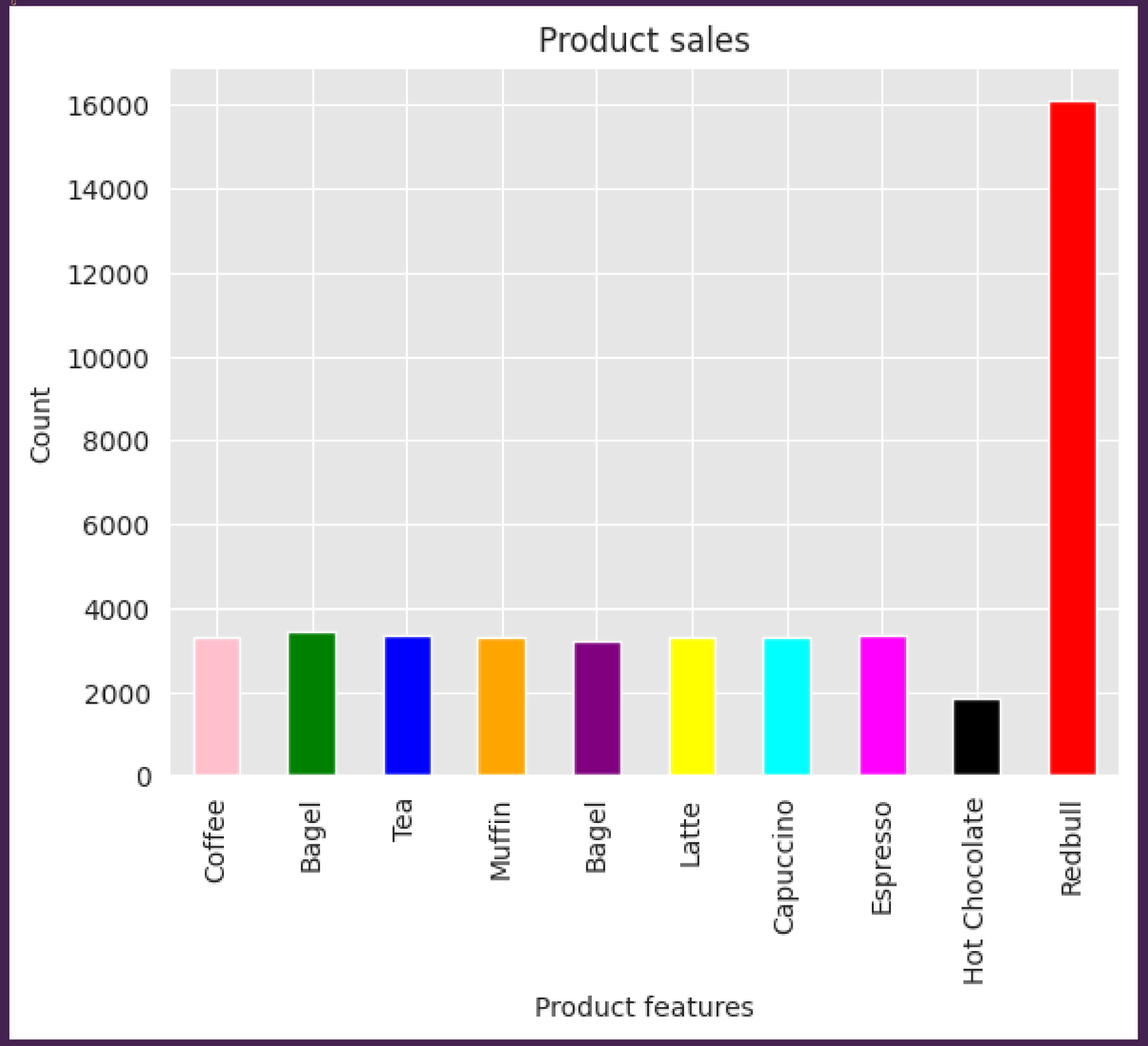

# GAS TRANSCTION COUNT

- Gas B has the highest number of transactions, while Gas A has the lowest number of transactions.
- The difference in transaction numbers between the two gases is not considered significant.



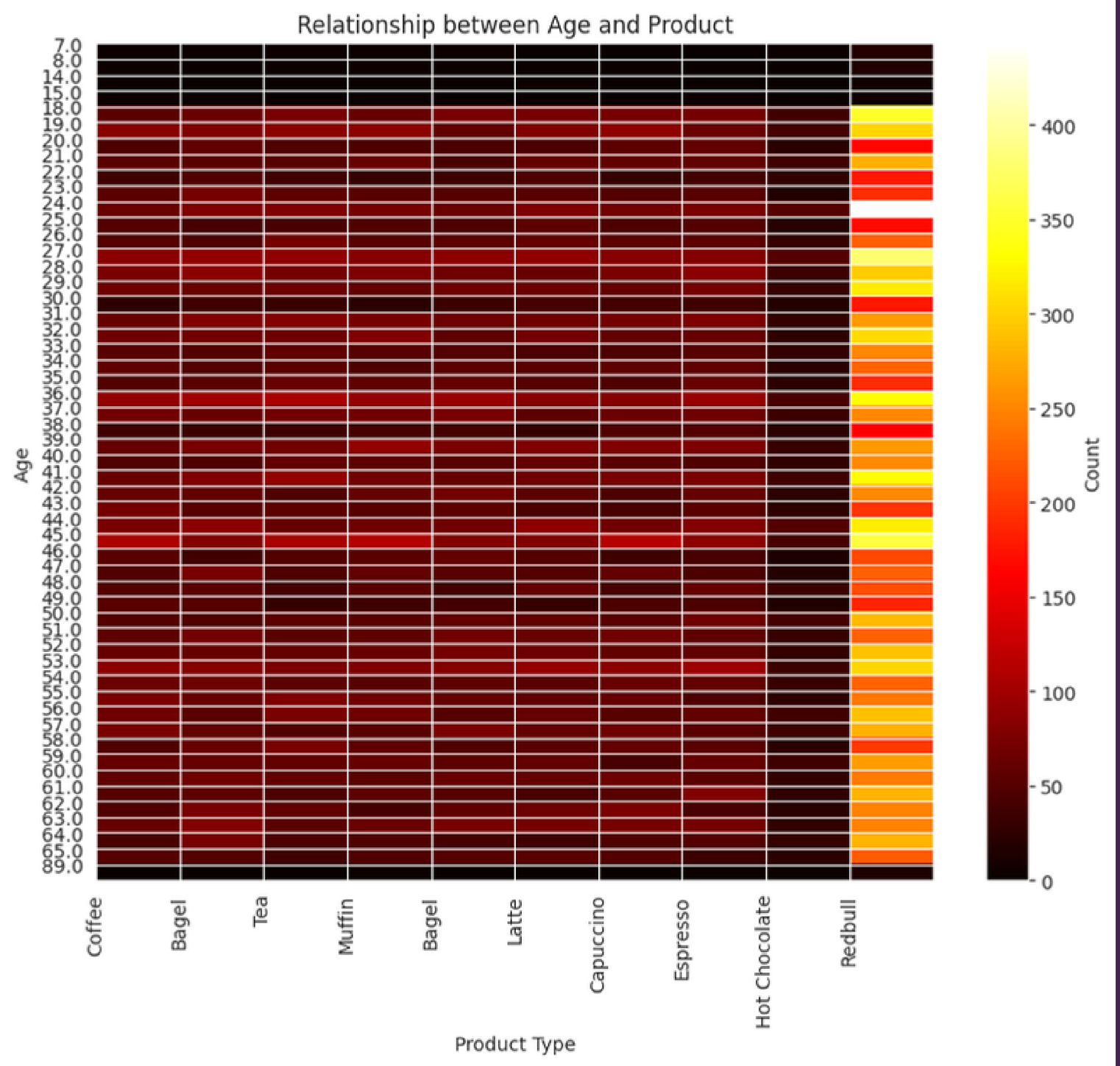

# DISTRIBUTION OF CUSTOMERS WHO HAVE A MEMBERSHIP

- There is a higher likelihood of individuals in the age range of 40-45 obtaining membership compared to other age groups.



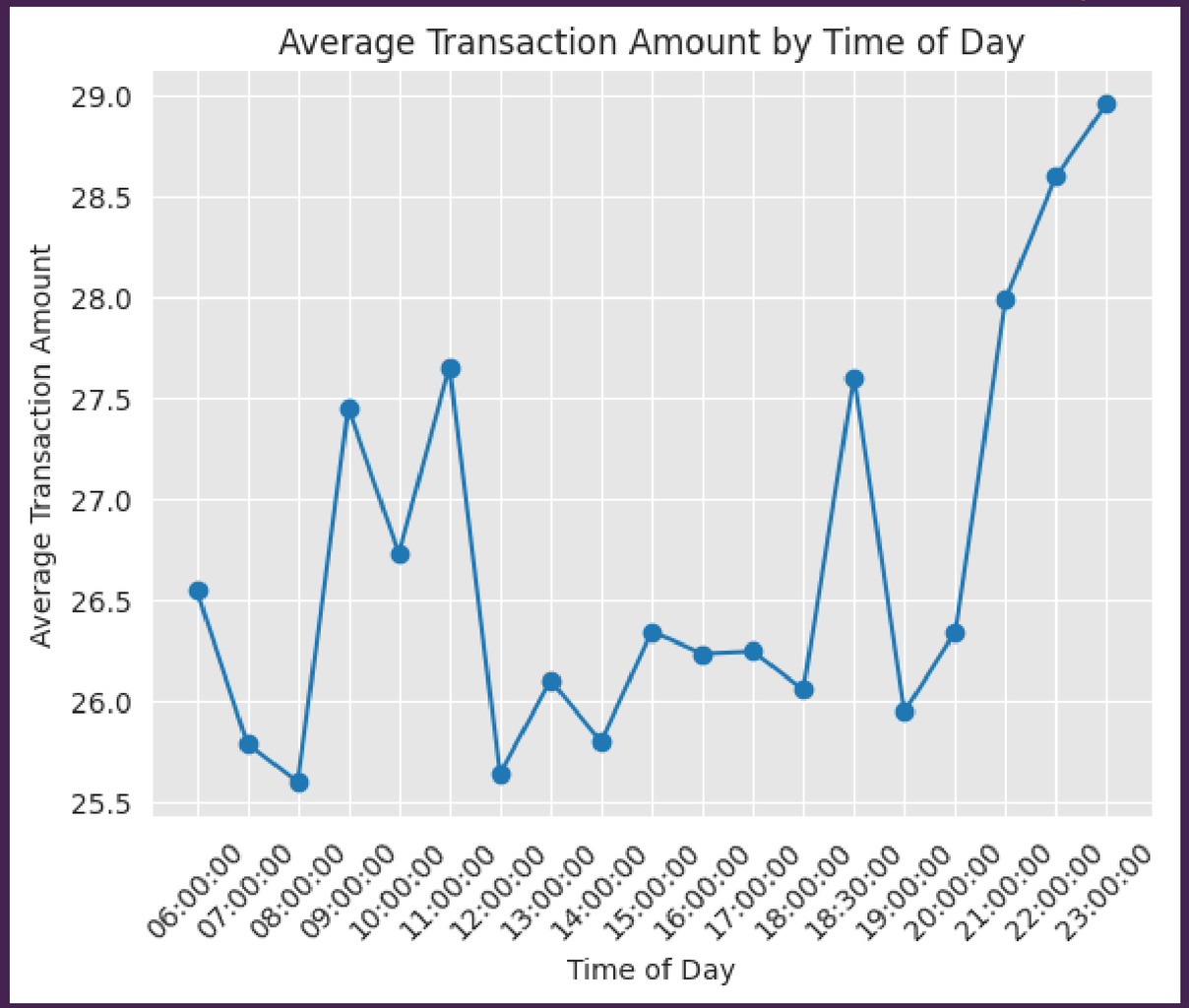

# DISTRIBUTION OF THE PURCHASE COUNTS FOR EACH PRODUCT

**Red Bull** has an overwhelmingly larger amount of sales compared to the other products. The difference in sales numbers between Red Bull and the other products is extremely significant.




# THE DISTRIBUTION OF PRODUCT PURCHASES ACROSS DIFFERENT AGES

Among the Red Bull customer, individuals aged 24 appear to have the highest purchasing




# AVERAGE INCOME FOR A GROCERY STORE THROUGHOUT THE DAY

- The period after 7pm appears to be the most favorable time for sales, based on the increasing average transaction trend.
- Sales numbers during the afternoon are relatively low compared to other times of the day.

# Product Recommendation Model

| account_id | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | ... | Mon | Sat | Sun | Thu | Tue | Wed | A | B | X | nan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1001** | 0 | 3 | 9 | 3 | 7 | 4 | 5 | 5 | 1 | 9 | ... | 10 | 12 | 5 | 3 | 3 | 8 | 9 | 9 | 5 | 23 |
| **1002** | 5 | 3 | 4 | 6 | 5 | 4 | 3 | 4 | 0 | 10 | ... | 6 | 7 | 9 | 5 | 10 | 3 | 12 | 8 | 4 | 20 |
| **1003** | 3 | 1 | 7 | 2 | 4 | 5 | 4 | 4 | 1 | 13 | ... | 8 | 7 | 8 | 3 | 6 | 6 | 7 | 5 | 9 | 23 |
| **1004** | 3 | 2 | 6 | 6 | 4 | 2 | 5 | 1 | 2 | 9 | ... | 6 | 3 | 4 | 3 | 10 | 8 | 10 | 4 | 5 | 21 |
| **1005** | 5 | 7 | 6 | 5 | 2 | 1 | 2 | 4 | 0 | 13 | ... | 4 | 7 | 8 | 7 | 4 | 4 | 9 | 8 | 12 | 16 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **2996** | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 4 | ... | 1 | 0 | 1 | 1 | 2 | 1 | 3 | 0 | 1 | 4 |
| **2997** | 2 | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 9 | ... | 3 | 0 | 3 | 3 | 1 | 1 | 2 | 5 | 2 | 6 |
| **2998** | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 5 | ... | 1 | 0 | 2 | 1 | 4 | 2 | 3 | 1 | 1 | 6 |
| **2999** | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 4 | ... | 3 | 1 | 1 | 0 | 0 | 2 | 1 | 2 | 1 | 4 |
| **3000** | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 5 | ... | 2 | 0 | 2 | 1 | 0 | 1 | 2 | 1 | 2 | 4 |

# Create a pivot table with account_id as index and product bought, time visited, day of week, and gas type as columns

| account_id | 1001 | 1002 | 1003 | 1004 | 1005 | 1006 |
|---|---|---|---|---|---|---|
| account_id | | | | | | |
| **1001** | 1.000000 | 0.887569 | 0.930078 | 0.880052 | 0.865883 | 0.873488 |
| **1002** | 0.887569 | 1.000000 | 0.925961 | 0.901305 | 0.879335 | 0.875385 |
| **1003** | 0.930078 | 0.925961 | 1.000000 | 0.896530 | 0.895536 | 0.938801 |
| **1004** | 0.880052 | 0.901305 | 0.896530 | 1.000000 | 0.838279 | 0.887440 |
| **1005** | 0.865883 | 0.879335 | 0.895536 | 0.838279 | 1.000000 | 0.878497 |
| ... | ... | ... | ... | ... | ... | ... |
| **2996** | 0.571574 | 0.616662 | 0.623615 | 0.646721 | 0.589383 | 0.621936 |
| **2997** | 0.554472 | 0.595599 | 0.605612 | 0.583525 | 0.655450 | 0.569465 |
| **2998** | 0.605249 | 0.688137 | 0.672916 | 0.707522 | 0.636302 | 0.659728 |
| **2999** | 0.665188 | 0.601110 | 0.670370 | 0.636552 | 0.614946 | 0.615769 |
| **3000** | 0.585340 | 0.611080 | 0.658176 | 0.603804 | 0.680793 | 0.644131 |

# Generate the cosine similarity matrix between account_id

# Recommend a product from another account_id with highest similarity

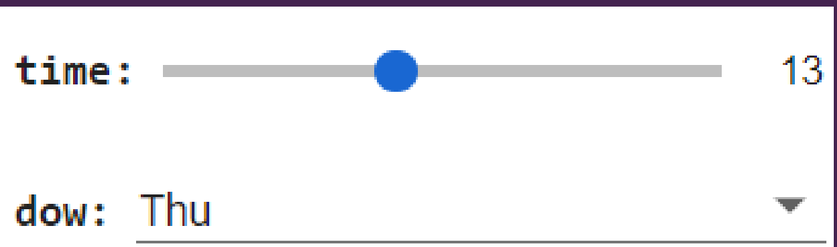
```
Please Select Customers ID to recommend: 1001
Bought by 1001: Crossaint, Tea, Muffin, Bagel, Latte, Cappuccino, Espresso, Hot Chocolate, Redbull
Recommending products by 1423....
Bought by 1423: Coffee, Crossaint, Tea, Muffin, Bagel, Latte, Cappuccino, Espresso, Hot Chocolate, Redbull
I would like to recommend you: Coffee
```

# HOT PRODUCT !!!

```
time = 13 #@param {type:"slider", min
dow = "Thu" #@param ["Mon", "Tue", "W

print(f"Hot Product : {get_hot_sale(t
```

```
Hot Product : Crossaint
```



# Business Strategy

# Earning Summary

- Product Purchase = $ 147,870
- Gas Price Purchase = $ 1,177,437
- Total Earning = $ 1,177,437
- Avergage product cost per transaction = $ 3.05

## Top 3 Purchased Product

- Red Bull 
- Croissant 
- Espresso 

# 5

# May Mix Match


+

# I know you want this!

**A** Buy redbull at normal price $4 per can

• • •

**B** Get 1$ discount when buy 2 cans

WOW!

**C** Buy red bull and the recommended item for just $5.5

GREAT


# BOOST UP

By

Red Bull®


Gen Z customer group purchased many red bulls

# Menu


## Iced Red bull

$ 6.5

## Red Bull Soda

$ 7.15


## Red Bull Lemon Soda

$ 7.8

**Overhead Cost and 30% Profit**

# Thank you for listening!