Starbucks Customer and Offer Marketing Analysis

Debbie Trinh

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Introduction

Starbucks is a Business To Consumer Company that is the largest coffeehouse chain in the world. It offers specialty coffee, food items, handcrafted beverages, and merchandise.

The goal of this project is to understand the marketing attribution of the Starbucks rewards offer marketing strategy which drives user engagement / transactions to positively impact the bottom line.

Today's Objective

Understand the Customer: Descriptive Statistics

Number of Members / Aggregate Spend (Pages 5-6)

Spending by Age Group using Sturges Rule (Pages 7-8)

Spend Distribution by Customer Segments / Active vs Inactive Members (Pages 9-10)

User Tenure Distribution (Page 11)

Influence of Reward Offers on User Behavior

Actions taken in Marketing Funnel (Page 13)

Customer Personas that complete reward offers (Pages 14-15)

Top and Bottom Performing Offer Type Variants / Gender that completes most offers (Pages 16-19)

Channel Effectiveness (Pages 20-21)

Reward Offer Response Rate vs Conversion Rate (Page 22)
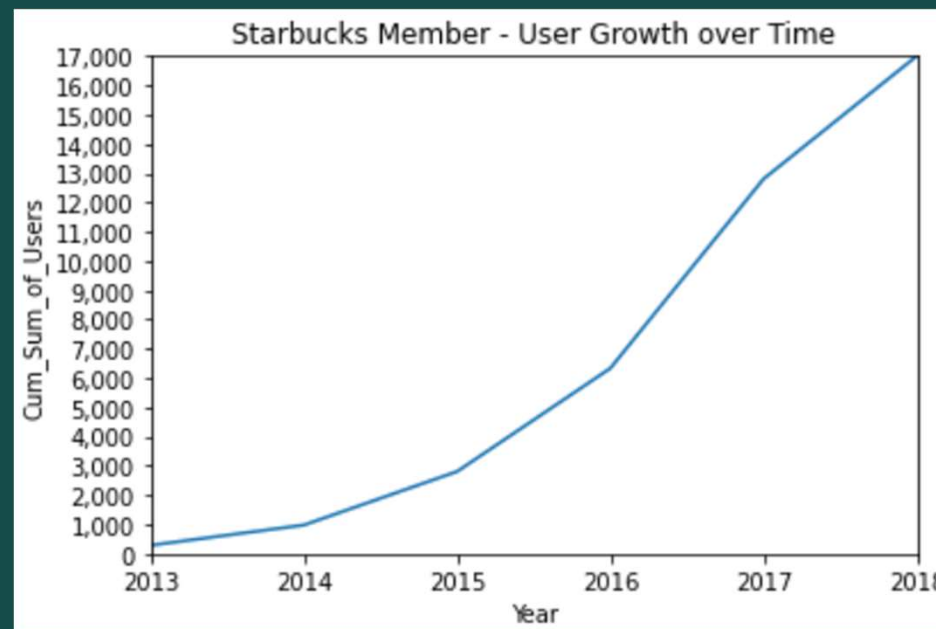
Takeaways (Page 23)

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Next Steps / Future Work to Improve Marketing Strategy via ML (Page 26)
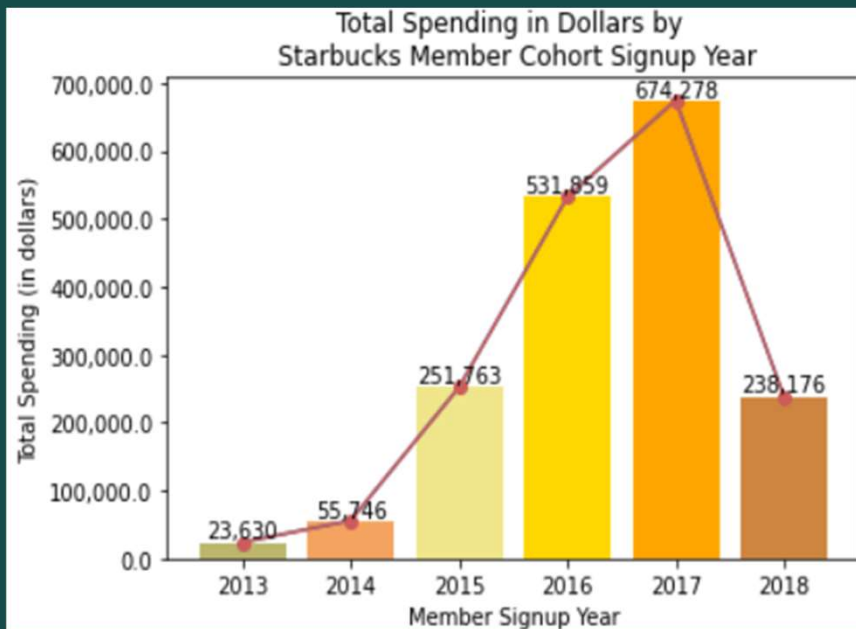
Understand the Customer: Descriptive Statistics

Starbucks member user growth in this sample is exponential.


Starbucks Member - User Growth over Time

The growth rate of Starbucks member user sign ups in this sample was exponential from 2013-2017, which demonstrates the popularity of this loyalty program.

Starbucks members are high-value.

Total Spending in Dollars by Starbucks Member Cohort Signup Year

- 2013: 23,630
- 2014: 55,746
- 2015: 251,763
- 2016: 531,859
- 2017: 674,278
- 2018: 238,176

Average Spend by Member Signup Year

- 2013: $82.62
- 2014: $80.67
- 2015: $137.58
- 2016: $150.84
- 2017: $104.23
- 2018: $56.74

These customers represent $1.8M in Starbucks gross revenue over a month. While there were sharp increases in user sign ups between 2013 and 2017, the 2016 cohort spent the most on average per person.

# Starbucks average spend increases with customer age.
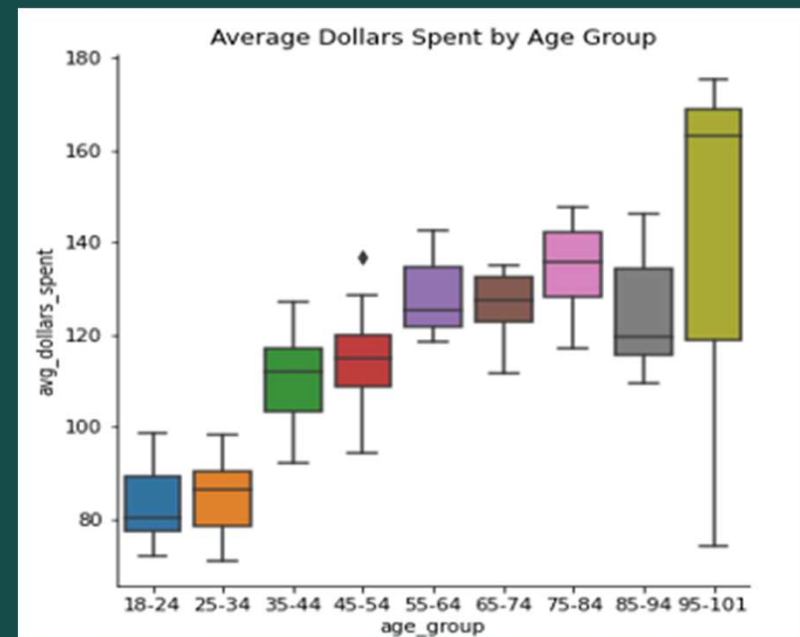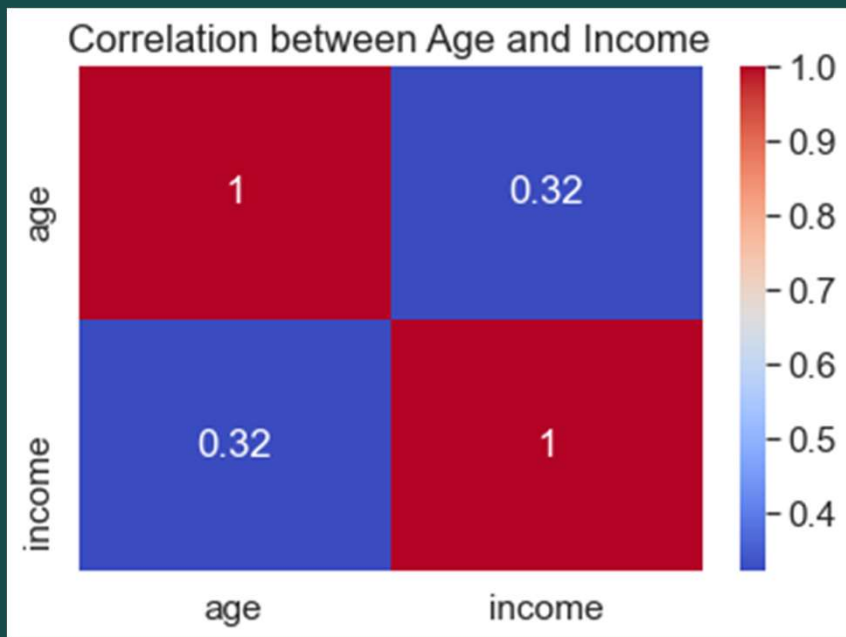
Target age groups 35-50, 51-67, 68-83, and 84-101 with reward offers.

Average Dollars Spent by Age Group
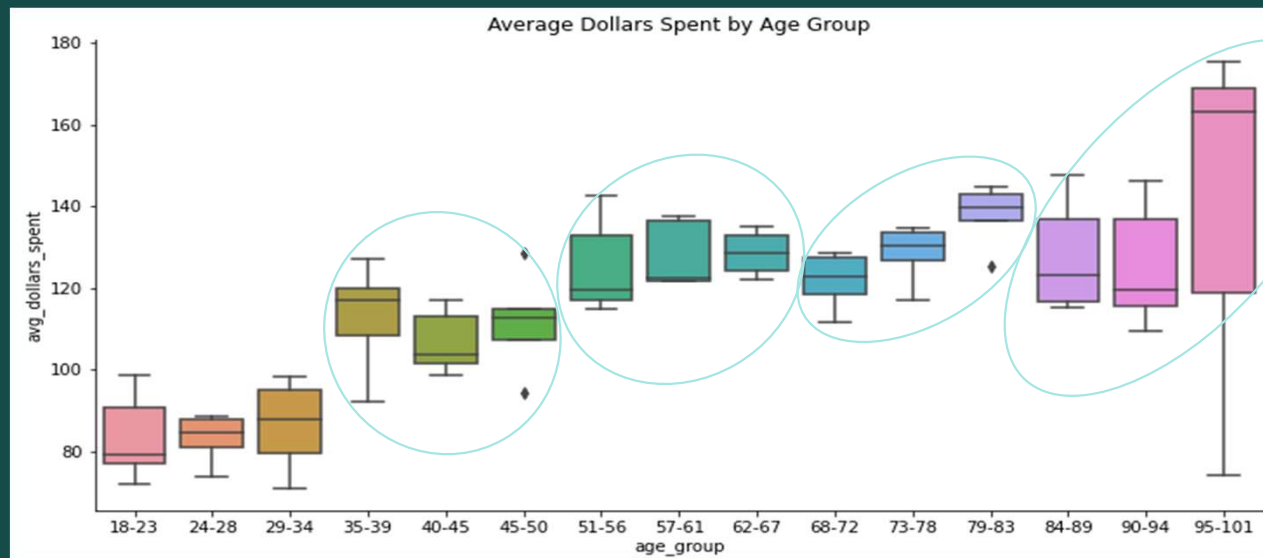
Using Sturges rule from Statistics to determine the optimal number of bins ($\log_2 N + 1$), 15 bins were prescribed.
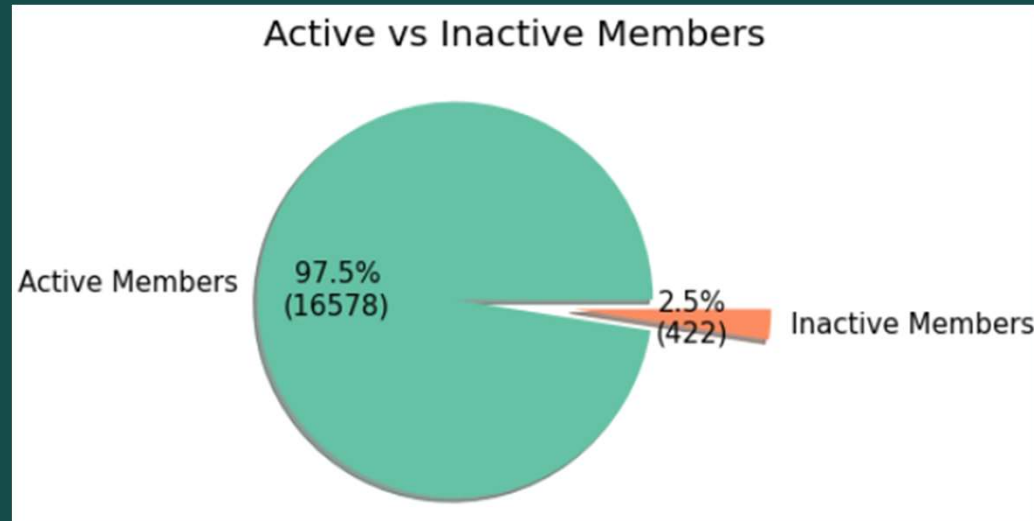
Recommendation: Send offers that resonate with users in their life stage to increase their propensity to spend.

Starbucks members who are female spend more than males on average across age groups.

Average Spend by Age Group and Gender
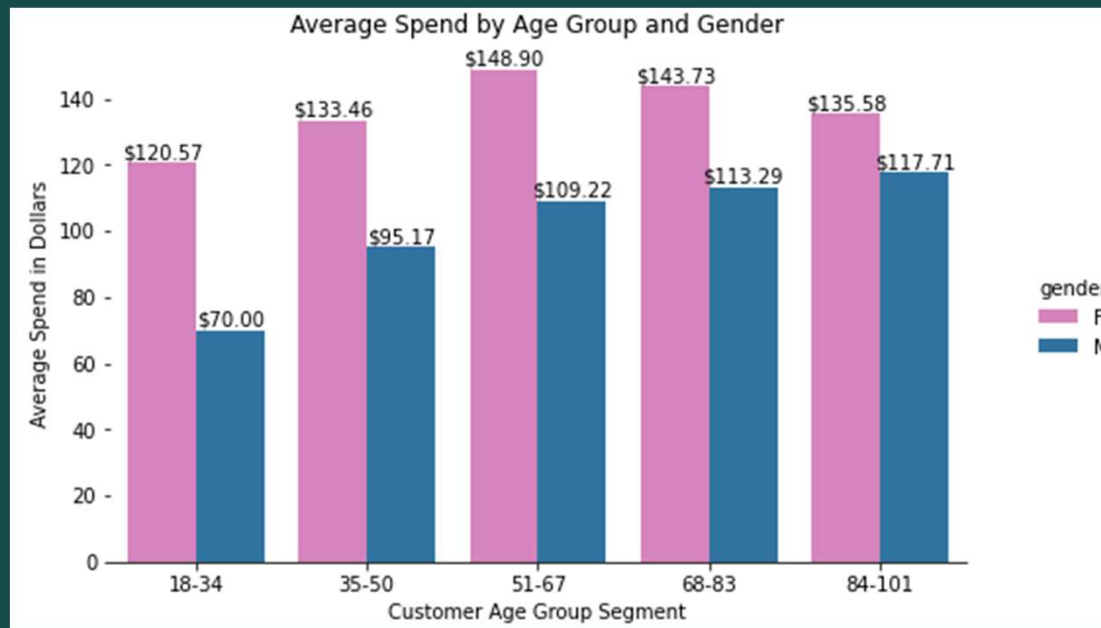
There is opportunity to activate
2.5% of inactive members.

Active vs Inactive Members

Active Members | 97.5%
(16578) | 2.5%
(422) | Inactive Members

Short term tactic: Offer a free good / pair a free good with a conditional action to inactive members.

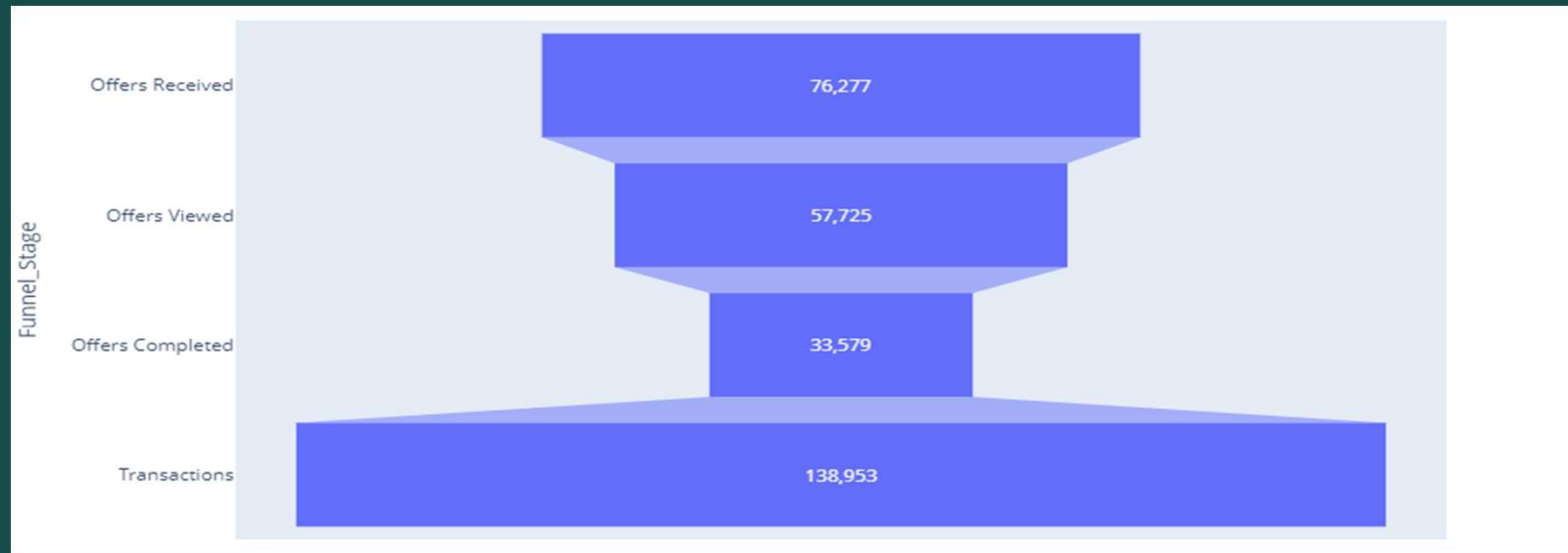Long term tactic: Offer loyalty discount offers to consistently active members.

The average user tenure is 6 years, ranging between 4.5 and 9.5 years.
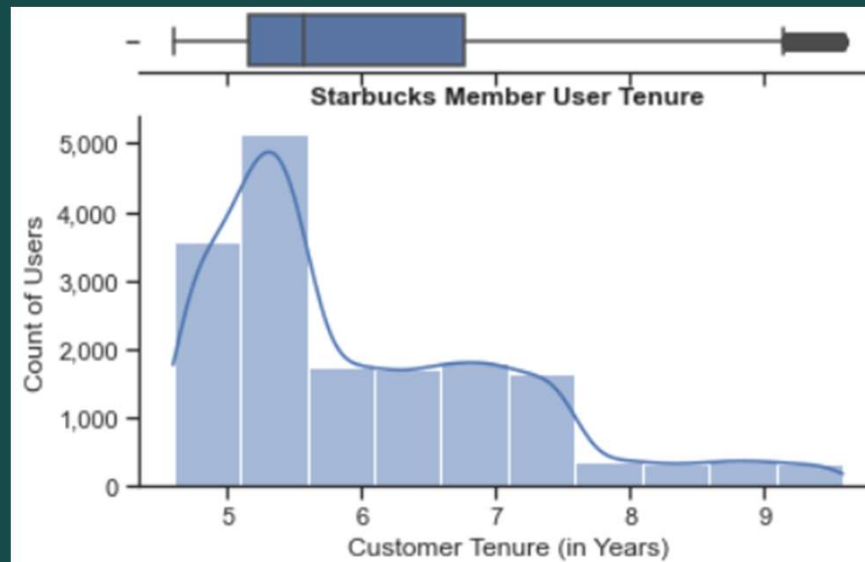
User tenure may be a useful feature to customer segmentation.

Influence of Reward Offers on User Behavior

While reward offers influences user behavior, some customers purchase independent of offers.

Starbucks reward offers are completed by users across age and gender.
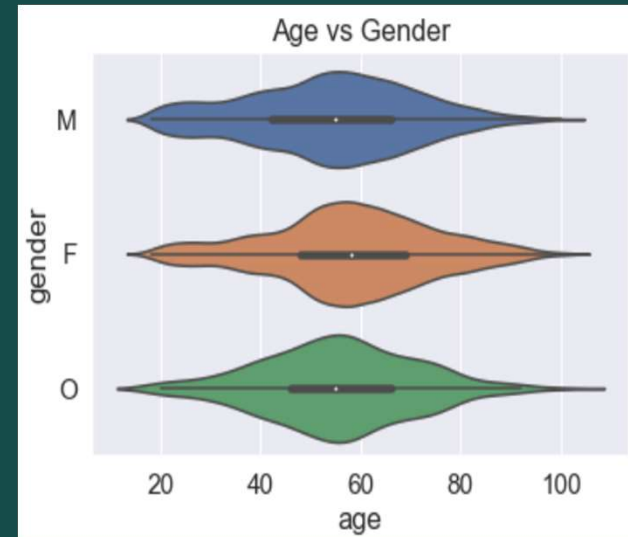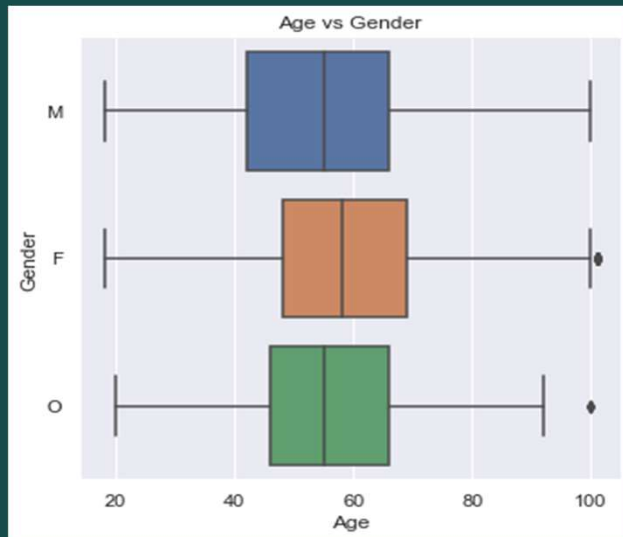
Starbucks reward offers are completed by users across gender and income.

Bottom Line: Starbucks rewards offers can appeal to anyone across demographic categories!

A majority of the top 5 performing offer variants are discount reward offers. The best performing BOGO offers are $5 difficulty and $5 reward.

Response Rate of Reward Type Variant
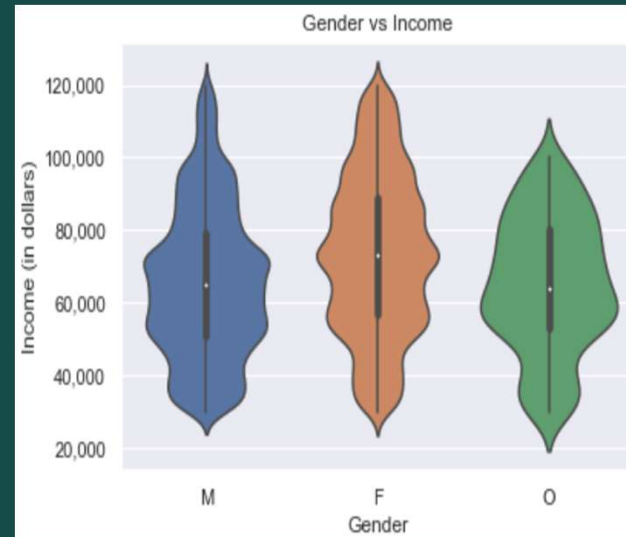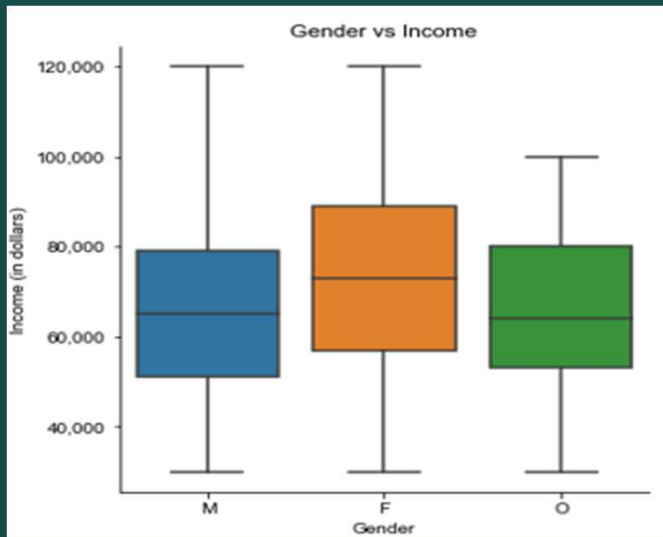**(Ranked from Highest to Lowest)**

Offer Type Variant

	Percent	Offers Received	Offers Completed
DISCOUNT: Spend: 10.0, Reward: 2.0, Duration: 10.0	70.0	7,597	5,317
DISCOUNT: Spend: 7.0, Reward: 3.0, Duration: 7.0	67.4	7,646	5,156
BOGO: Spend: 5.0, Reward: 5.0, Duration: 7.0	56.7	7,677	4,354
BOGO: Spend: 5.0, Reward: 5.0, Duration: 5.0	56.7	7,571	4,296
DISCOUNT: Spend: 10.0, Reward: 2.0, Duration: 7.0	52.6	7,632	4,017
BOGO: Spend: 10.0, Reward: 10.0, Duration: 7.0	48.2	7,658	3,688
DISCOUNT: Spend: 20.0, Reward: 5.0, Duration: 10.0	44.6	7,668	3,420
BOGO: Spend: 10.0, Reward: 10.0, Duration: 5.0	43.9	7,593	3,331

Legend:
- Number of Offers Completed
- Number of Offers Received
- Percent of Offers Completed/Offers Received

The bottom 3 performing offer variants are $20 difficulty discount and $10 BOGO offers.

Response Rate of Offer Type Variant:
Ranked From Highest to Lowest

(Green if Response Rate >=50%, Red Otherwise)
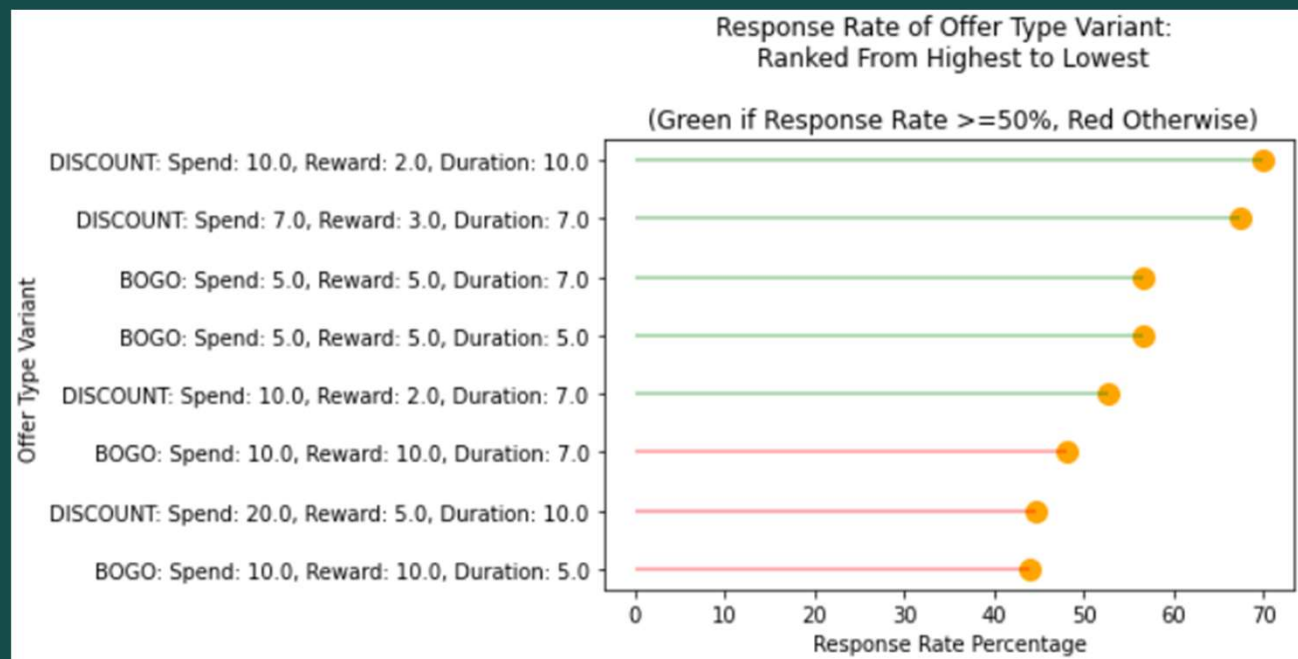
They are bottom performing offers possibly because of their difficulty to complete and/or consumers not desiring a second item.

Offers with the same difficulty and reward perform better with a longer offer duration.
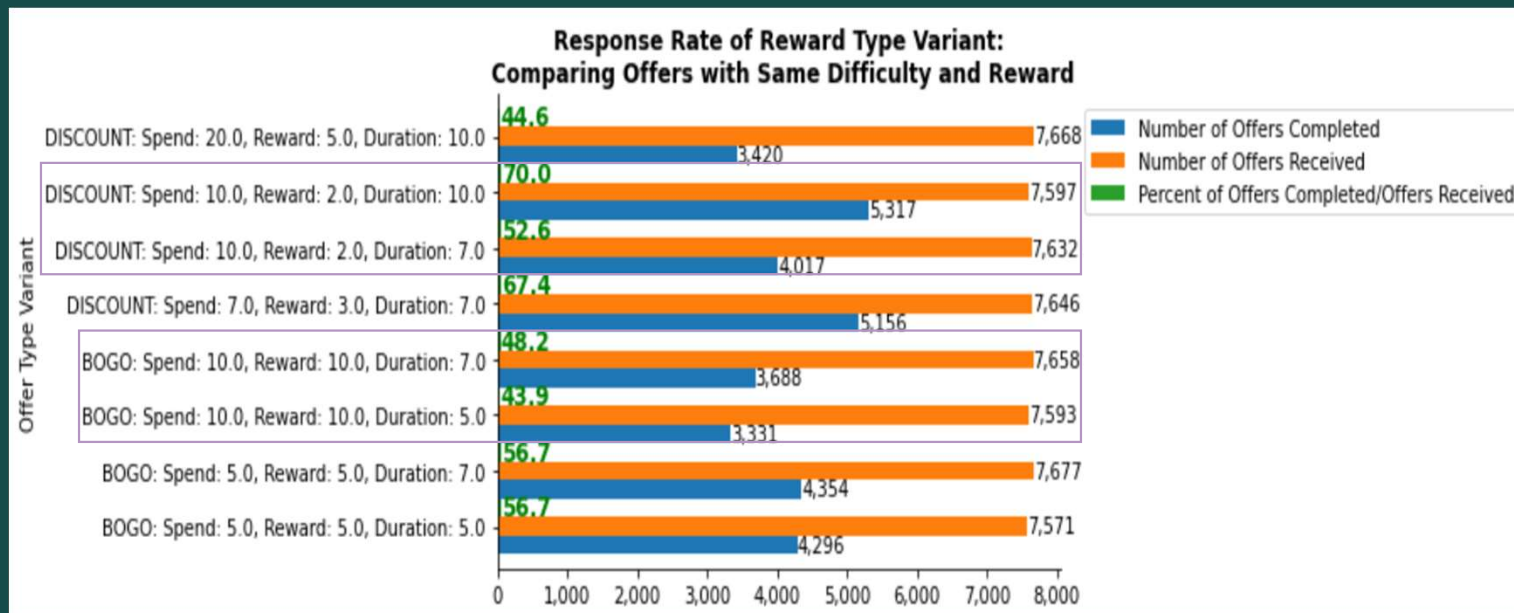
The longer the offer is available, the likelihood the user has enough days to prioritize it while having urgency to act on it and complete the rewards offer.

The top 10 performing rewards offers are typically completed by females and are discount offers that have a 7-10 duration to complete.

Response Rate of Offers Type Variants by Gender: Ranked from Highest to Lowest

(Green if Response Rate >=50%, Red Otherwise)

DISCOUNT: Spend: 10.0, Reward: 2.0, Duration: 10.0, Gender: F, Rank: 1
DISCOUNT: Spend: 7.0, Reward: 3.0, Duration: 7.0, Gender: F, Rank: 2
BOGO: Spend: 5.0, Reward: 5.0, Duration: 7.0, Gender: F, Rank: 3
DISCOUNT: Spend: 10.0, Reward: 2.0, Duration: 10.0, Gender: M, Rank: 4
BOGO: Spend: 5.0, Reward: 5.0, Duration: 5.0, Gender: F, Rank: 5
DISCOUNT: Spend: 7.0, Reward: 3.0, Duration: 7.0, Gender: M, Rank: 6
DISCOUNT: Spend: 10.0, Reward: 2.0, Duration: 7.0, Gender: F, Rank: 7
BOGO: Spend: 10.0, Reward: 10.0, Duration: 7.0, Gender: F, Rank: 8
BOGO: Spend: 10.0, Reward: 10.0, Duration: 5.0, Gender: F, Rank: 9
DISCOUNT: Spend: 20.0, Reward: 5.0, Duration: 10.0, Gender: F, Rank: 10
BOGO: Spend: 5.0, Reward: 5.0, Duration: 5.0, Gender: M, Rank: 11
BOGO: Spend: 5.0, Reward: 5.0, Duration: 7.0, Gender: M, Rank: 12
DISCOUNT: Spend: 10.0, Reward: 2.0, Duration: 7.0, Gender: M, Rank: 13
BOGO: Spend: 10.0, Reward: 10.0, Duration: 7.0, Gender: M, Rank: 14
DISCOUNT: Spend: 20.0, Reward: 5.0, Duration: 10.0, Gender: M, Rank: 15
BOGO: Spend: 10.0, Reward: 10.0, Duration: 5.0, Gender: M, Rank: 16

Reward Offer Type Variant (y-axis)
Response Rate Percentage (x-axis: 0, 20, 40, 60, 80)

The best performing BOGO offer by gender is valued at $5.
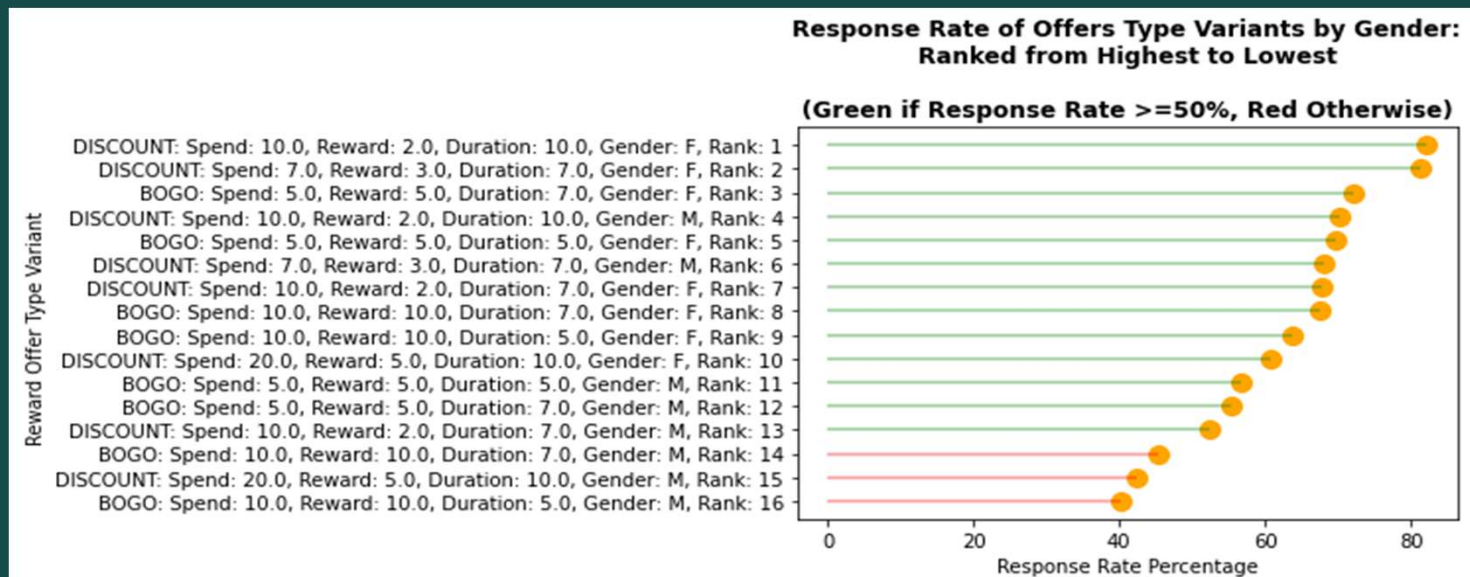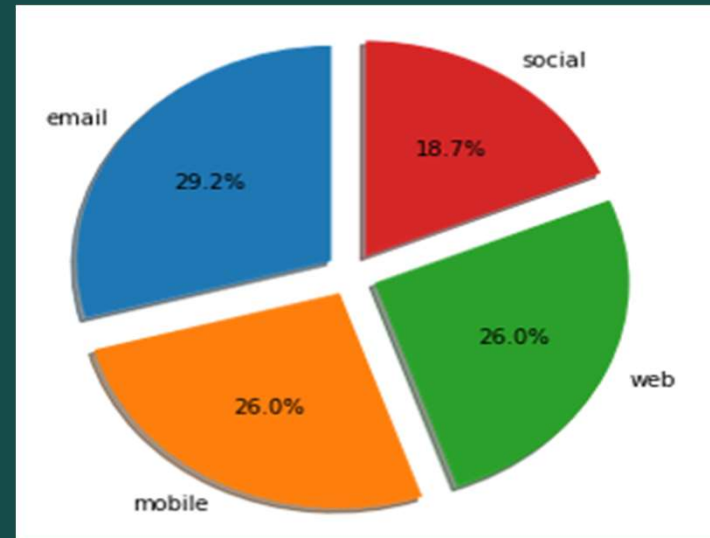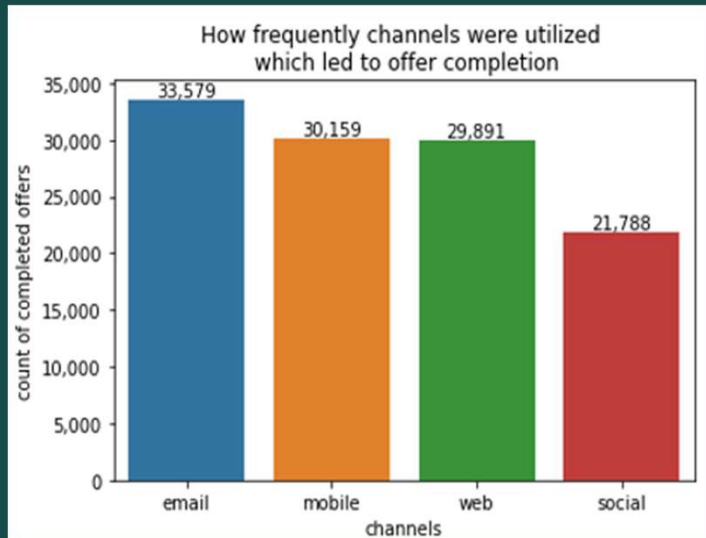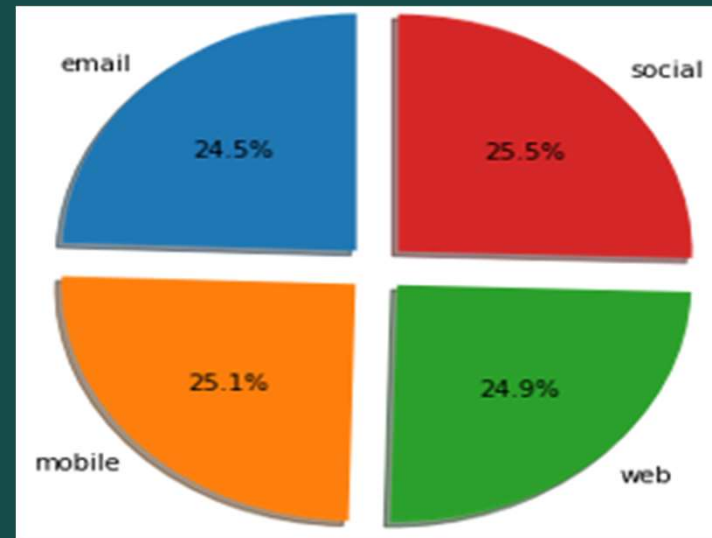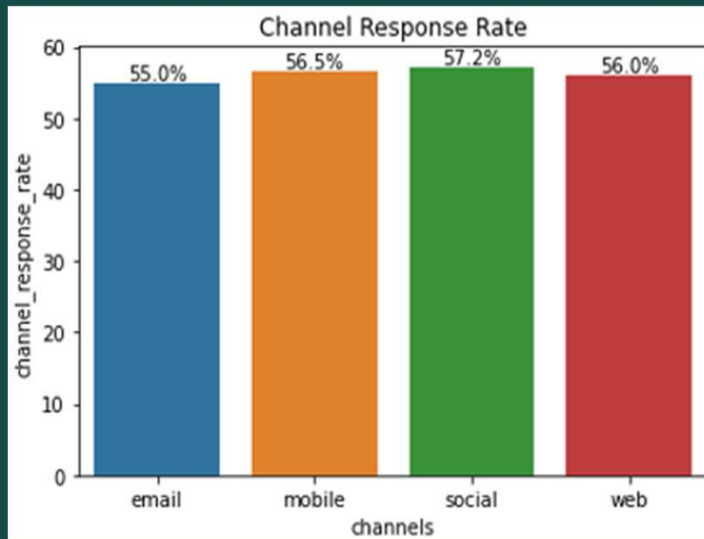The bottom performing offers by gender are $20 difficulty discount & $10 BOGO offers.

The same trend by gender is also what is observed at the aggregate level.

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Emails were used most frequently to complete offers, followed by mobile & web, and then social.
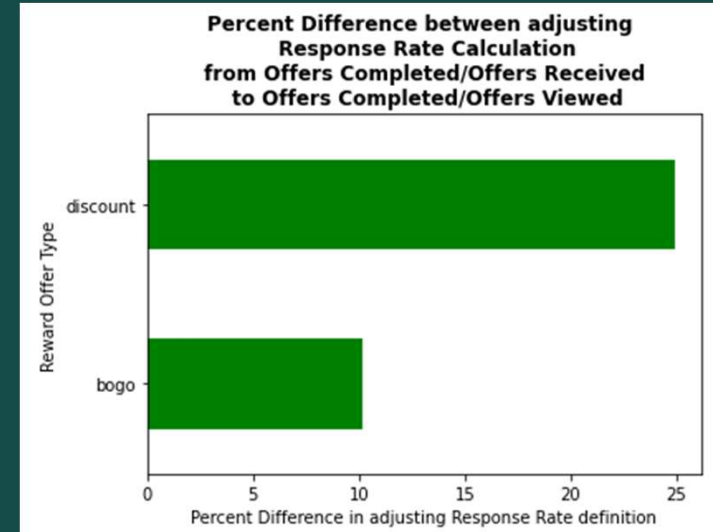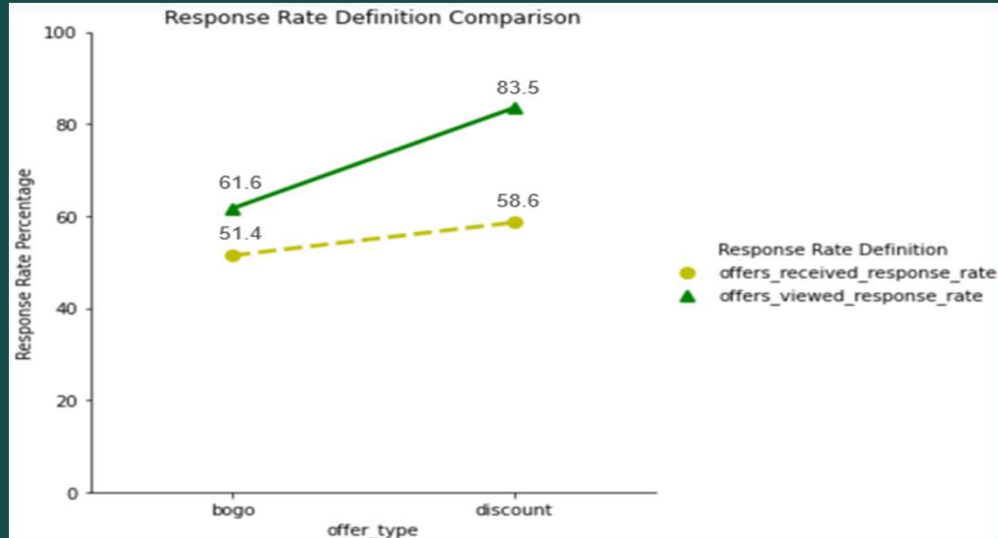
It's essentially a tie in channel effectiveness.

Each channel has similar response rates from the user of 55-57%.

Discount offers have a higher response rate and a higher likelihood of completion conditional on being viewed.

If you can get customers to view the offer,

the response rate improves by 25% for discount offers & 10% for BOGO offers.

Bottom Line: Get users to be positively engaged in the long run!

Takeaways

Starbucks average spend increases with customer age as income increases.

2.5% of members are inactive. A short-term tactic to activate them is by offering a complimentary item that can be contingent on an action. A long-term tactic is by offering loyalty discount offers for members who are consistently active so inactive members are incentivized to participate.

Offers with the same difficulty & reward performed better with a longer offer duration.

While email is the most frequently used channel, all channels (email, mobile, web, social) exhibit similar response rates from the user of 55-57%. Continue with current channel strategy as it is.

Discount offers perform relatively better than BOGO rewards offers. If you can motivate users to view the offer, the response rate improves by 25% for discount & 10% for BOGO offers.

Marketing Strategy Actionable Recommendations: Personas to Target & Strategy for Offer Type Variants

For future reward promotional strategy, target age groups 35-50, 51-67, 68-83, 84-101 because they tend to spend more at Starbucks than younger age groups. One suggestion is to tailor reward offers that resonate with them in their life stage to increase their propensity to spend.

Continue to target female consumers by promoting Starbucks Discount reward offers with a

7-to-10-day duration to complete them.

Continue to promote the best performing BOGO offer, which has a $5 difficulty and $5 reward.

Consider reducing $20 difficulty discount offers and $10 BOGO offers, which does not as well relative to existing reward offers because of their difficulty to complete.

What's next?

Roadmap ahead

Next Steps / Future Work
to Improve Marketing Strategy via ML

1. Further data analysis to determine total transactions to credit each reward offer type variant.

2. Do customer segmentation and clustering based on key features (Note: Customer segmentation can help suggest similar reward offers to users that haven't seen that reward offer based on their cluster).

3. Create attribution rules for direct and indirect attribution to display as key metrics.

4. Create an R Shiny dashboard to display key metrics.

5. Feature engineer to enhance dashboard metrics, such as user tenure and average time to complete an offer.

6. Create and evaluate marketing attribution model. Productionize model.

The way to get started is to quit talking and begin doing.

Walt Disney

Thank you

Python Libraries Used:

Pandas
Numpy
Matplotlib
Seaborn
Plotly
Sklearn
Datetime
Json

Debbie Trinh

https://www.linkedin.com/in/debbietrinh/

New York City Data Science Academy

January 2023 Cohort