Maximizing Campaign Impact: Predicting Campaign Response for iFood and Revenue Increase Strategies

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1) Introduction

ifood is a huge food ordering platform in Brazil and Colombia. They occupy a staggering 80% of the industry in Brazil. Their sources of revenue are commission charged on every order placed, delivery fees, and membership fees to restaurants. For any of this to happen, ifood needs more people using their platform. ifood has a financial constraint. They don't want to send campaigns to every user. Hence, the task is to create a visualization that segments their users and build a model that correctly predicts users that will respond positively to their campaigns.

By the end of this project, a model capable of predicting customers who will accept iFood's campaigns, with an accuracy rate of 87%, will be developed. However, it is noticed that iFood has a low acceptance rate from its customers, which is potentially impacting its revenue. 2 solutions (improve customer engagement and include Family friendly deals) will be recommended to increase acceptance rate and revenue.

2) SWOT Analysis

Strength	Weakness
Market Leadership - iFood is the dominant food delivery platform in Brazil, with significant market share and widespread brand recognition. **Strong Partnerships-** Collaborations with thousands of restaurants and food chains, providing customers with diverse dining options. **Parent Company Support -** Backed by global players like Prosus (Naspers), which provides financial stability and strategic expertise	**High Operational Costs -** Delivery logistics, rider wages, and tech platform maintenance result in significant expenses. **Dependence on External Partners -** Relies heavily on partner restaurants and delivery riders, making it vulnerable to changes in partnerships or workforce dissatisfaction.

| Opportunity	Threats
Expanding Beyond Food Delivery - Diversification into grocery delivery, pharmaceuticals, and convenience store products, as seen with iFood Mercado. **International Expansion -** Exploring opportunities in other Latin American markets with similar customer behavior and economic environments.	**Intense Competition -** Rivalry from other food delivery platforms such as Uber Eats, Rappi, and smaller regional players. **Post-Pandemic Demand Decline -** As dining out normalizes, food delivery demand might plateau or decline.

3) Exploratory Data Analysis

Exploratory Data Analysis was conducted on the dataset to get an idea of the household distribution. The dataset had 2,205 observations.

Income Distribution

The average income for households that use iFood is R$51,622. iFood customers have a wide spread of income distribution with some earnings as low as R$10,000 and others as high as R$110,000. However, most households earn between R$35,000 to R$70,000.

Figure 1:

Age Distribution

Figure 2:
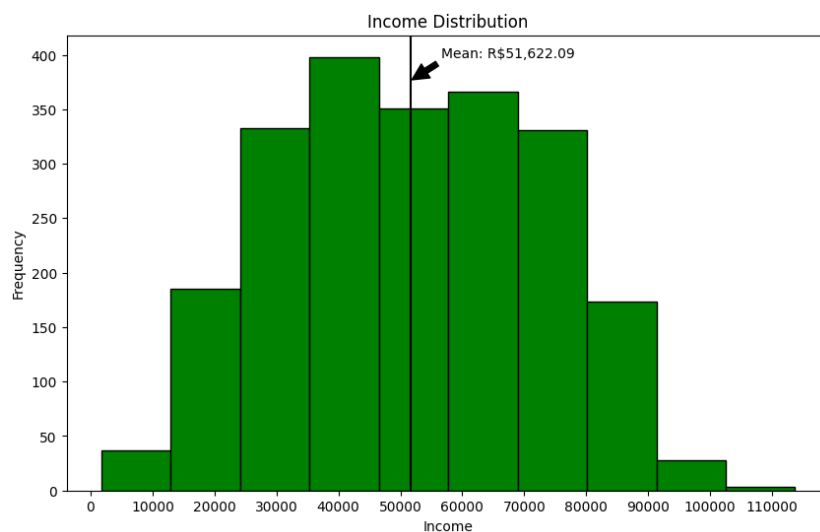
Half of the customers' age are below 50 and the other half are above with majority of customers being between 40 to 60 years of age. The most frequent age is roughly 45. Similar to income, the age distribution is widespread, ranging from 20 years to 80 years. This wide range makes sense as iFood deals with food which is an undifferentiated product that everyone consumes regardless of age.
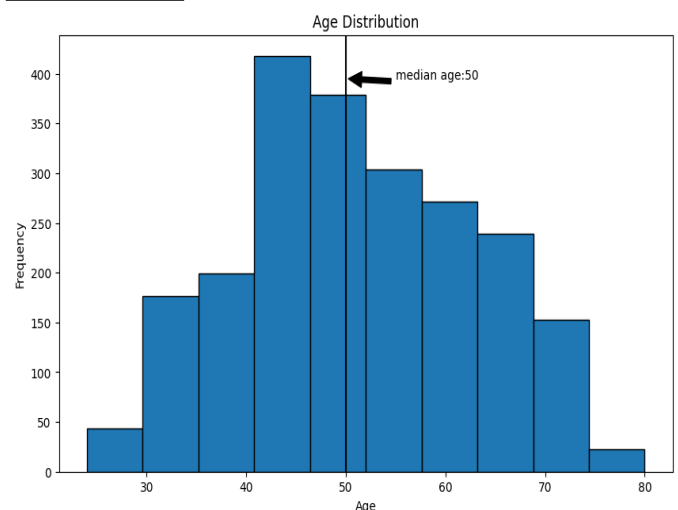

Amount of Food items purchased by Households

When exploring the total amount of goods purchased by households a right-skewed distribution is formed. This suggests that purchases in larger quantities, happen

less often. Inversely, purchases in smaller quantities are made more often, hence the diagram shows purchases between 1 – 200 as the most frequent.

Figure 3:

As the amount of purchase increases, the frequency of purchases decreases.
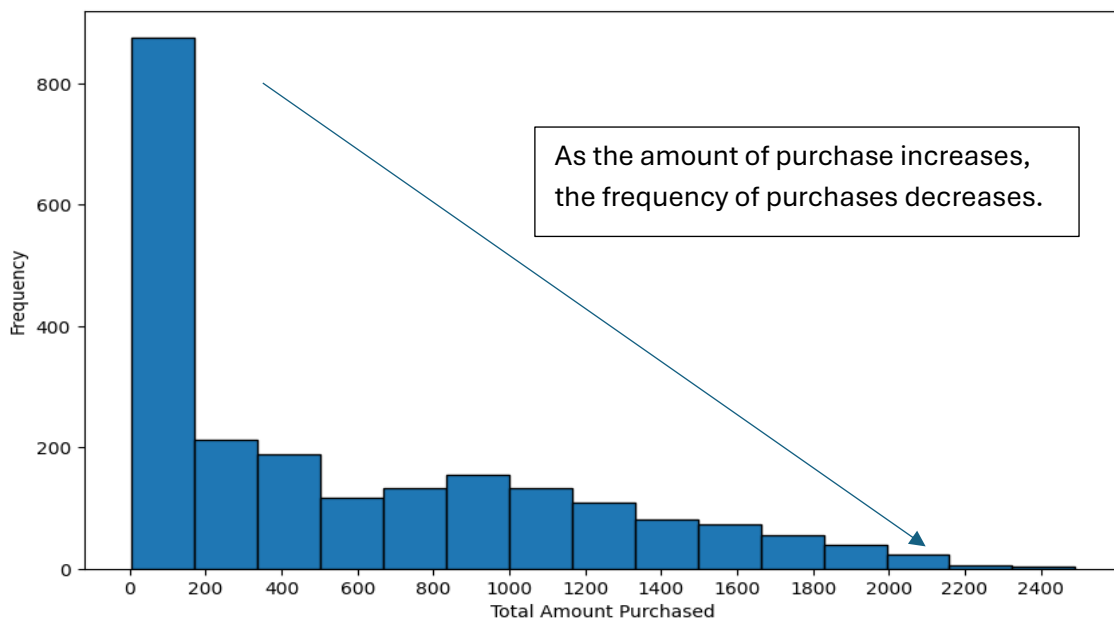
Analysing Campaign Acceptance

Results show there is a very low acceptance rate for the campaigns sent out. Most customers don't accept campaign offers suggesting the campaigns strategies used are not effective. Furthermore, the acceptance frequency reduces as the number of accepted campaigns increases. This indicates that there are low participation and engagement rate from customers. iFood should consider better strategies to increase engagement as this can potentially bring in new customers through mediums such as word of mouth.
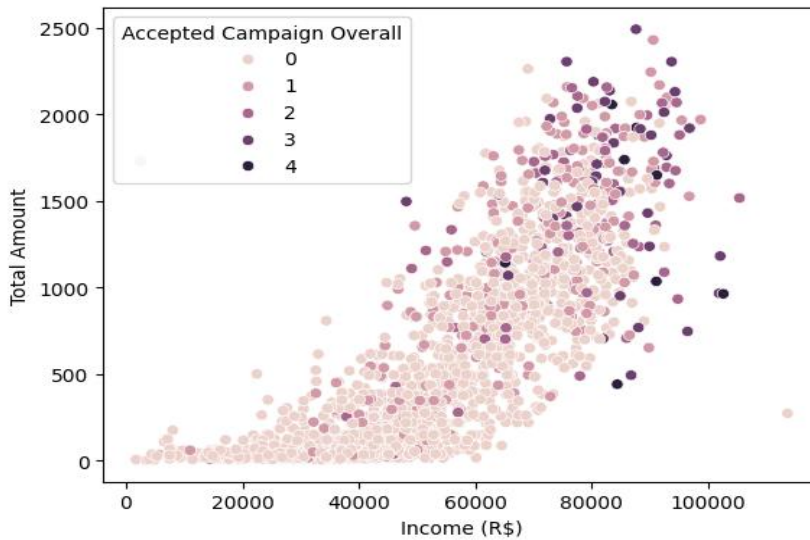
Figure 4:
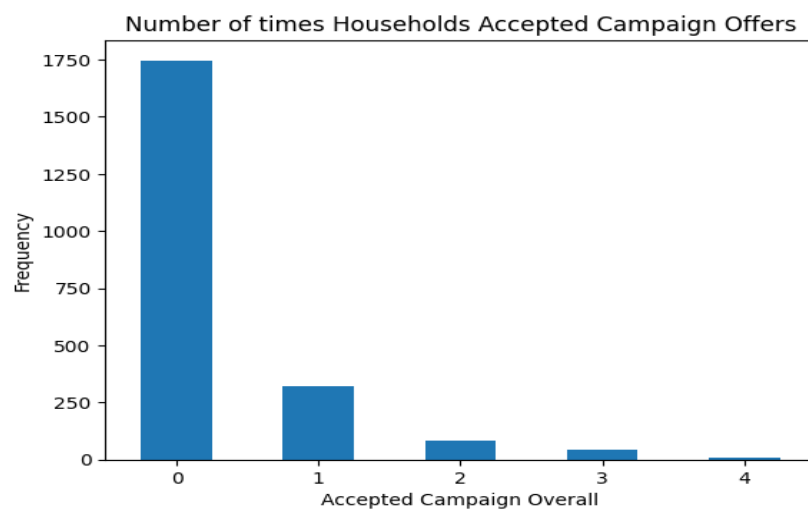
Since households only accepted 0 to 4 campaigns, a deeper dive was performed into each acceptance amount for more insights. When campaign acceptance was

compared with Income, a relationship was found - although fewer households accept more campaigns, those who accept more campaigns on average have a larger income.

Figure 5:

The graph on the left shows an increase in accepted campaigns as income increases. High earners are more inclined to accept campaigns.

The graphs below show the average income of each campaign acceptance amount. Notice the increase in average income for each acceptance amount.
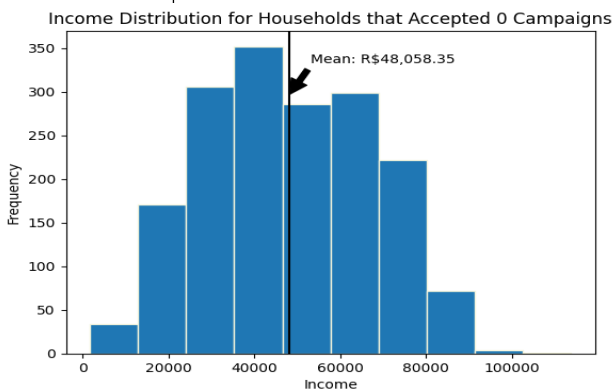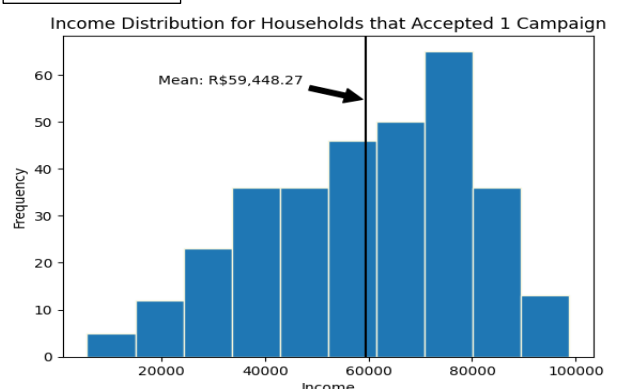
Figure 6:

Income Distribution for Households that Accepted 0 Campaigns
Mean: R$48,058.35

Figure 7:

Income Distribution for Households that Accepted 1 Campaign
Mean: R$59,448.27

Figure 8:

Income Distribution for Households that Accepted 2 Campaigns
Mean: R$75,745.19

Figure 9:

Income Distribution for Households that Accepted 3 Campaigns
Mean: R$82,877.27
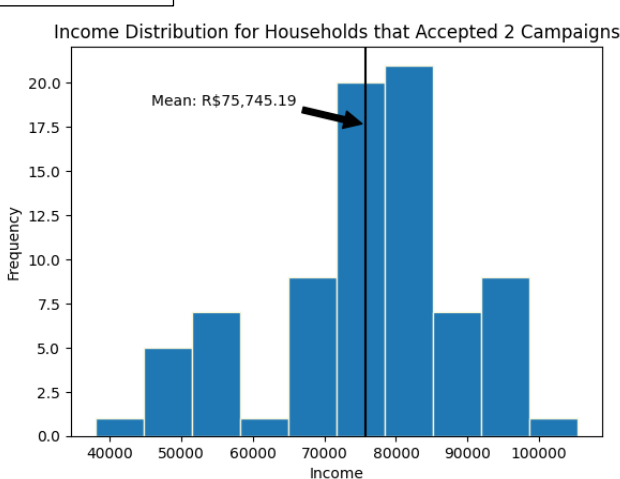
Figure 10:
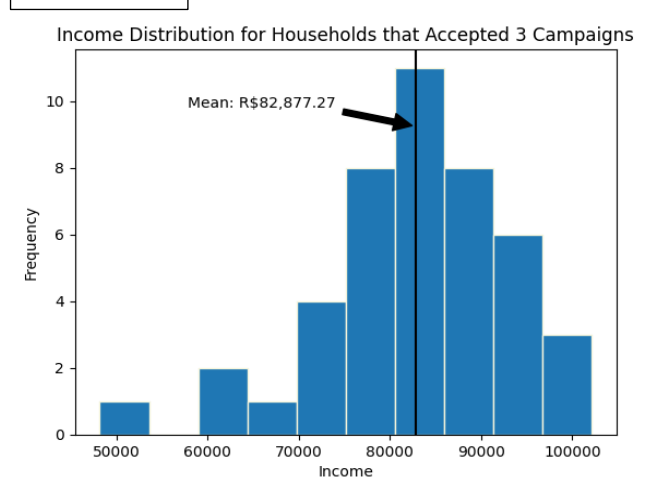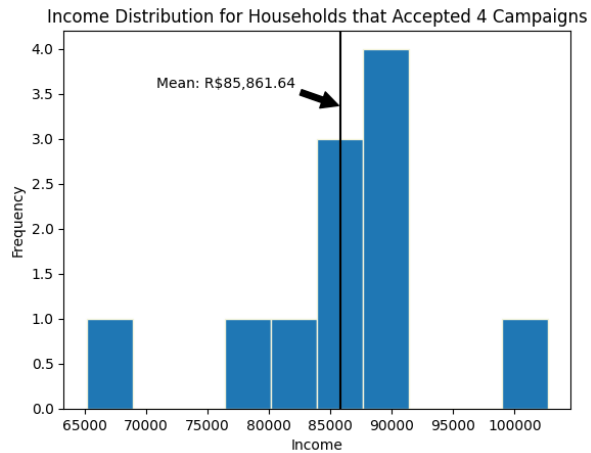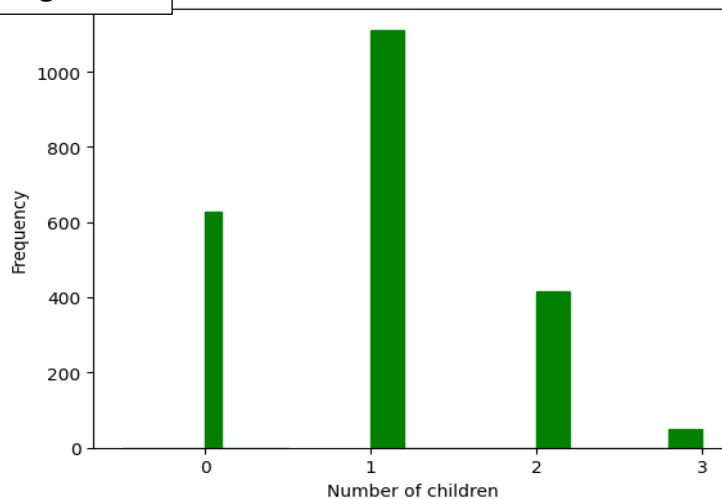
Income Distribution for Households that Accepted 4 Campaigns

Distribution of Household and Children

The data provided below shows that majority of households have children. Most households have just 1 child and the frequency reduces as the number of children increases.

Figure 11:

Generally, the presence of children in a household influences purchasing behavior of a household. For example, households with children may purchase more food-items because they have more mouths to feed. Surprisingly for iFood customers, there isn't a huge difference in total quantity of food purchased between customers with and without children. In fact, customers with children have purchased less than those without children.
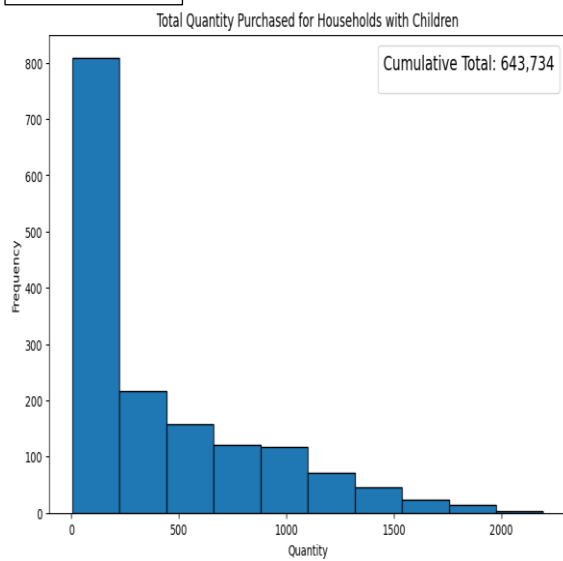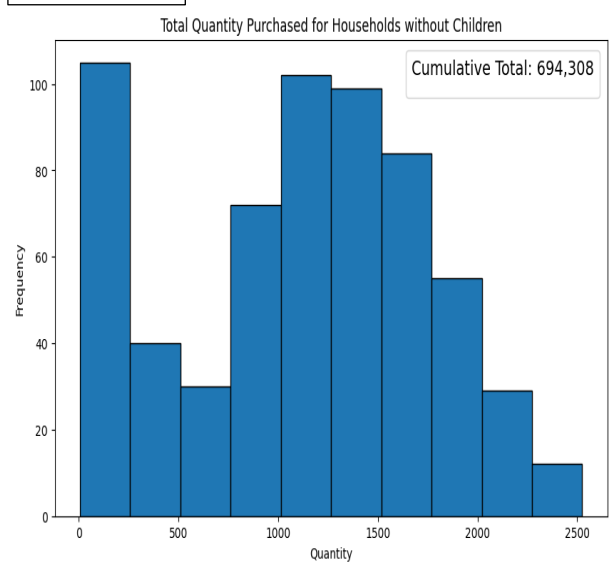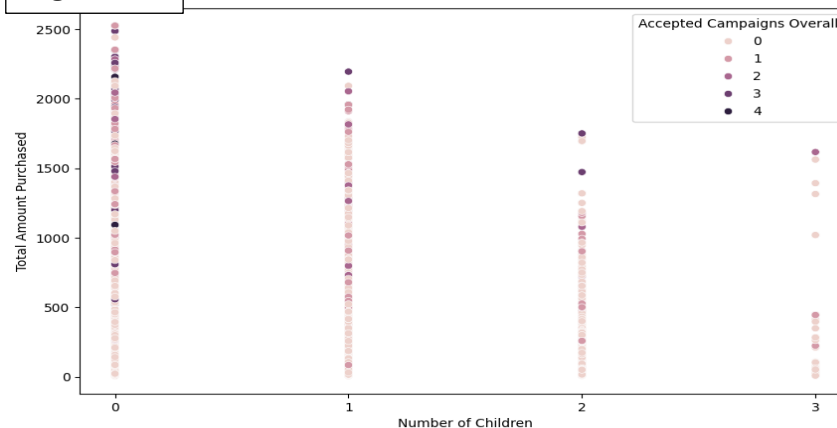
Figure 12:

Total Quantity Purchased for Households with Children

Cumulative Total: 643,734

Figure 13:

Total Quantity Purchased for Households without Children

Cumulative Total: 694,308

This behavioral difference indicates that customers behave differently depending on if they have a kid. It could be that those with children prefer home-made food, or they use other food services, or could be that iFood don't have family-friendly food deals.

Furthermore, when numbers of children and quantity purchased are analyzed with accepted campaigns, it is observed that households with children are less likely to accept campaigns.
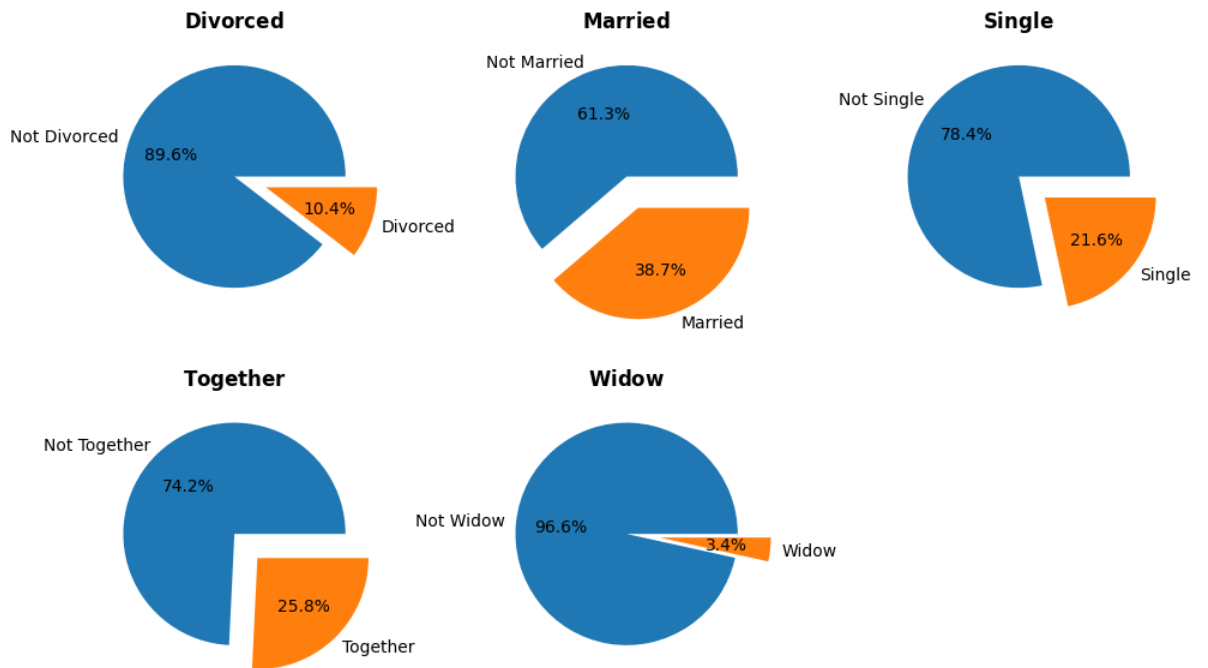

Figure 14:

Accepted Campaigns Overall
0
1
2
3
4

Exploring Marital Distribution

Majority (64.5%) of the iFood customers are either married (38.7%) or Together (25.8%) which corresponds to the fact that most customers have children. The other 35.4% are not in any relationship.

Divorced

Not Divorced
89.6%

10.4%
Divorced

Married

Not Married
61.3%

38.7%
Married

Single

Not Single
78.4%

21.6%
Single

Together

Not Together
74.2%

25.8%
Together

Widow

Not Widow 96.6%

3.4%
Widow

4) Customer Segmentation

A model was run to group iFood customers into separate clusters. Here, customers with similar characteristics are put in one group, allowing for better understanding of iFood's different customer types. After running the segmentation model, two (2) customer groups were formed.

Below are graphs that show how the groups are split:

Our model puts customers into 2 clusters and the separation mark is at R$51,622 which happens to be the average customer income (see first plot). Customers in the upper cluster earn more than the lower cluster customers and as a result they purchase more food quantity.
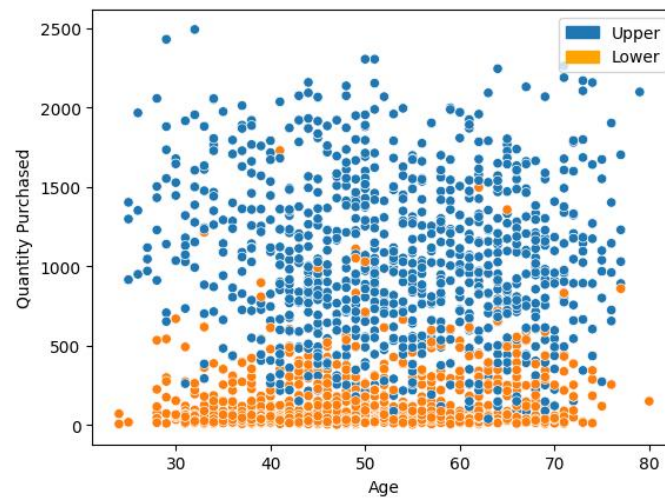
Figure 16:
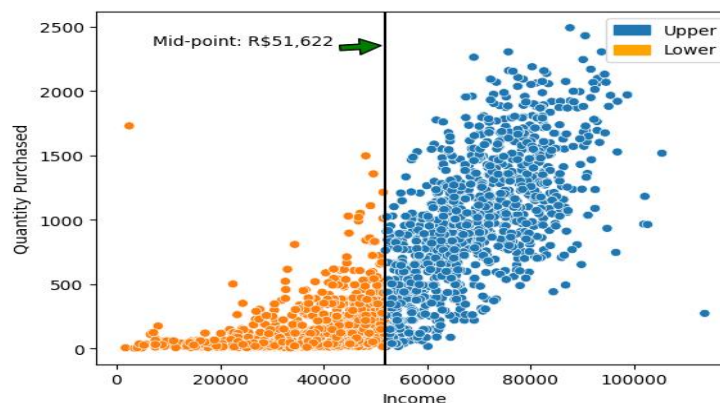
When quantity purchased and age were compared given the new clusters, there was nothing to indicate significant differences between them. Regardless of age, customers

purchased various amounts of food but the lower-cluster customers mainly purchased less quantity.

Figure 17:

5) Modelling and Predictions

The aim of modelling given iFood's financial concern is to predict the customers who will accept campaign correspondence. Accurate predictions are beneficial to iFood as they ensure that only the necessary resources are utilized to reach customers who are certain to respond, thereby saving costs and other resources.

3 models were trained and the best model selected generated an 87% accuracy after testing. Some of the most important features used to derive the accuracy of 87% were Days since customers started using iFood, Recency, and total number of campaigns customers have accepted in the past.

Below is a confusion matrix that summarizes the result of the prediction:

Total number of households used for testing is 441

Figure 19:

	Negative Prediction	Positive Prediction
Actual Negative	360	6
Actual Positive	47	28

This matrix shows:

360 households (81.6%) were predicted to not accept a campaign, and those households truly did not accept the campaign. However, 6 households (1.3%) were predicted to accept the campaign but did not in reality.

Furthermore, 28 households (6.3%) were predicted to accept a campaign and truly accepted the campaign. However, 47 households (10.7%) were predicted to accept the campaign but did not accept the campaign in reality.

In this situation, campaigns correspondence will be sent to the 28 households as our model predicts they will accept the campaign.

Analysis of the Model Results

An accuracy of 87% is a good result, iFood can be confident to send out campaigns to households based on this model. It is expected that majority of those households iFood are targeting will be contacted using this model. As a result, this helps achieve iFood's goal of optimizing resources when sending campaigns.

Challenges with the Model

The only downside to this result is that a campaign sent to only 28 out of 441 households represents a very small sample size, reaching a limited audience. It is recommended to increase the number of campaigns sent to households. Additionally, since the model isn't 100% accurate, involving more households will help compensate for the 13% error rate in the model's predictions.

Solution

In addition to the households the model correctly predicted to accept the campaign, the choice of including more households can be made based on some of the EDA performed previously.

In figure 6, when Campaign Acceptance was compared with Income, we noticed households with higher income especially those earning more than R$75,000 are more likely to accept campaigns. Hence, more customers from this category can be selected to be in the campaign pack.

Simulating Real Customers using Model

After selecting our model of choice, a simulation is ran to predict the customers that will accept iFood's campaign. This simulation consists of 100 customers, and each customer were randomly assigned different features such as their age, income, marital status etc – to mimic real customers (see html file).

The results suggested 19 customers (19%) will accept the campaign. The simulation generated a better campaign acceptance percent than the test model, however, the acceptance rate is still below what iFood ideally wants. Therefore, to increase the acceptance rate, iFood also must increase the engagement rate.

6) Final Analysis and Recommendations

The model built helps iFood in its quest to optimize resources. With an accuracy as high as 87%, they can be more confident that campaigns will reach their intended targets. Additionally, this method significantly cuts waste of resources for those households who would have otherwise received campaign correspondence without accepting them.

Although we are now able to pinpoint the 'right customers' for the campaign, it has been noticed that they make up only a small portion of iFood's total customer base. Finding ways to increase this portion can help increase revenue.

Areas of consideration to increase revenue for iFood:

1) **Improve customer engagement to improve acceptance rate**:
   The reason for low campaign acceptance is because campaigns aren't reaching customers the way that is expected. This could be because customers don't resonate with the campaign message, campaigns don't reach customers (poor logistics), the medium of communication is inefficient. As an attempt to improve engagement, Ifood should ensure their communication is frequent and their medium should be in line with current trends e.g. social media platform such as TikTok, Instagram, YouTube etc should be regularly utilized - this will have a better reach.

2) **Include Family friendly deals**:
   From figures 11, it was observed that households with children are significantly more than those without children. Unexpectedly, those households purchase less food quantity than those without children as shown in figures 12 and 13. To increase amount of food purchased, Ifood can use a concentrated marketing approach to target those families. This can be through family friendly meal deals (price bundling), meals specifically for kids, etc. This should improve quantity purchased for those families – hence, increase revenue.

   Furthermore, a leader pricing approach can also be used for to increase family purchases. Campaigns or advertisements can target families with enticing offers in hopes they'll order other items while shopping.