



# iFood Assignment

optimizing marketing campaign **response**



# Introduction

The main goal of the analysis was to understand the **base core customer profile** and **predict** which customers are more likely to respond to a **marketing campaign**.

- Part 1 Exploratory Data Analysis
- Part 2 Cluster Analysis
- Part 3 Predicting Campaign Response
- Part 4 Recommendations



# Data Overview

**2.240**  
customers

**28**  
features

**5**  
products

**3**  
sale  
channels

**2**  
years period

**1.356.988**  
monetary unit  
of revenue

**~72**  
monthly monetary  
unit per client



wines



rare meat products



prepared fish



exotic fruits



sweet products



physical stores



catalogs

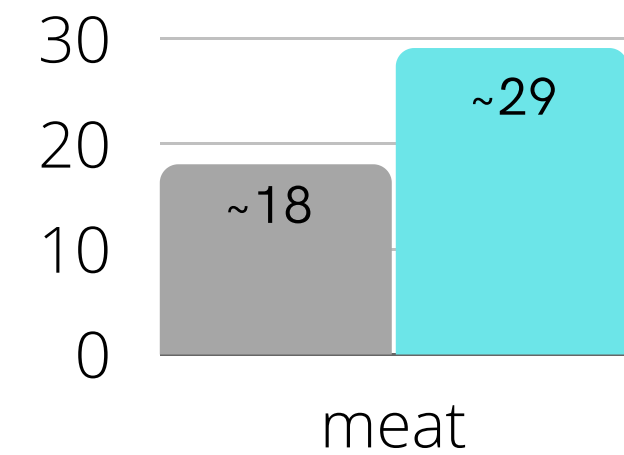


website

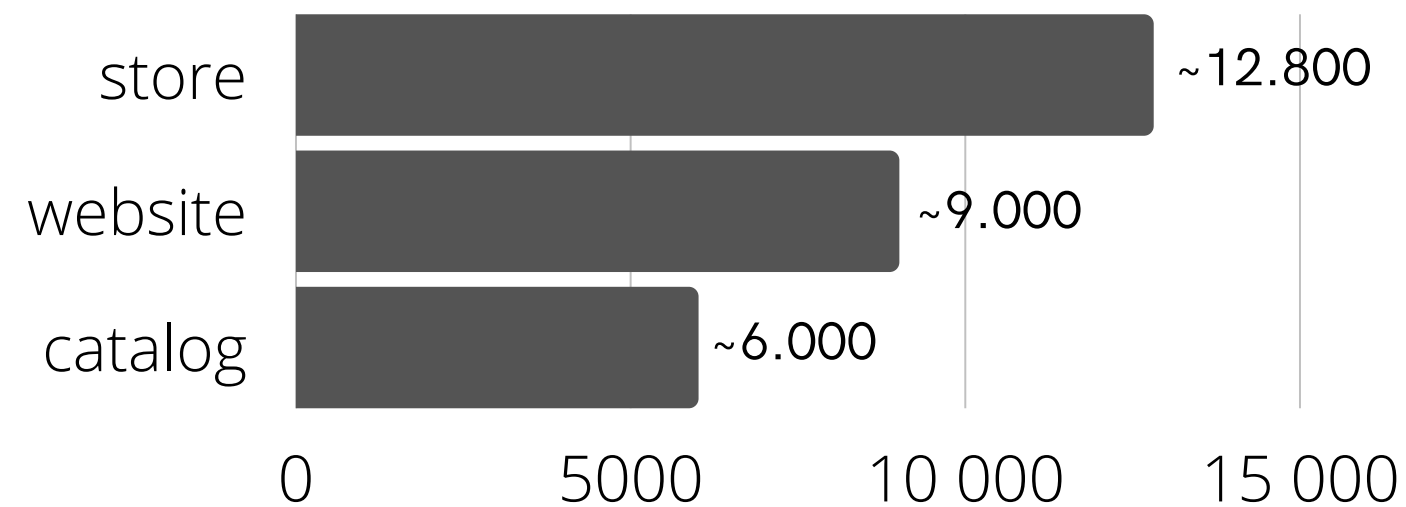
# Products



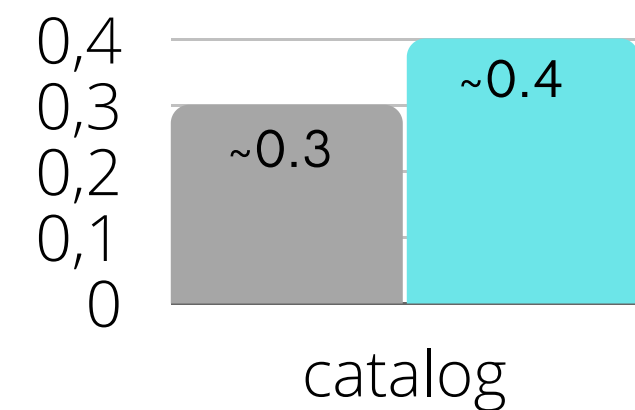
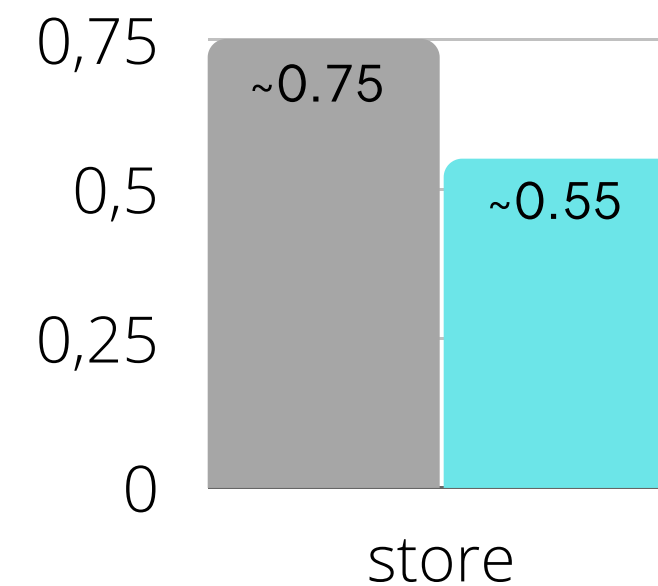
Avg. Monthly Amount Spent by Response



# Channels



Avg. Monthly Number of Purchases by Response



# Profile

## Age Group

**45**

years old  
(average)

40 - 49 30%

30 - 39 25%

50 - 59 21%

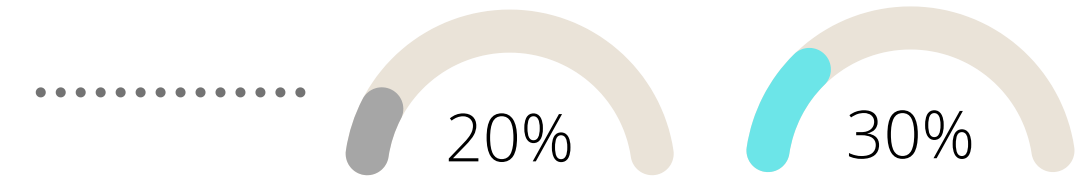


## Education

Graduation 50%

PhD 22%

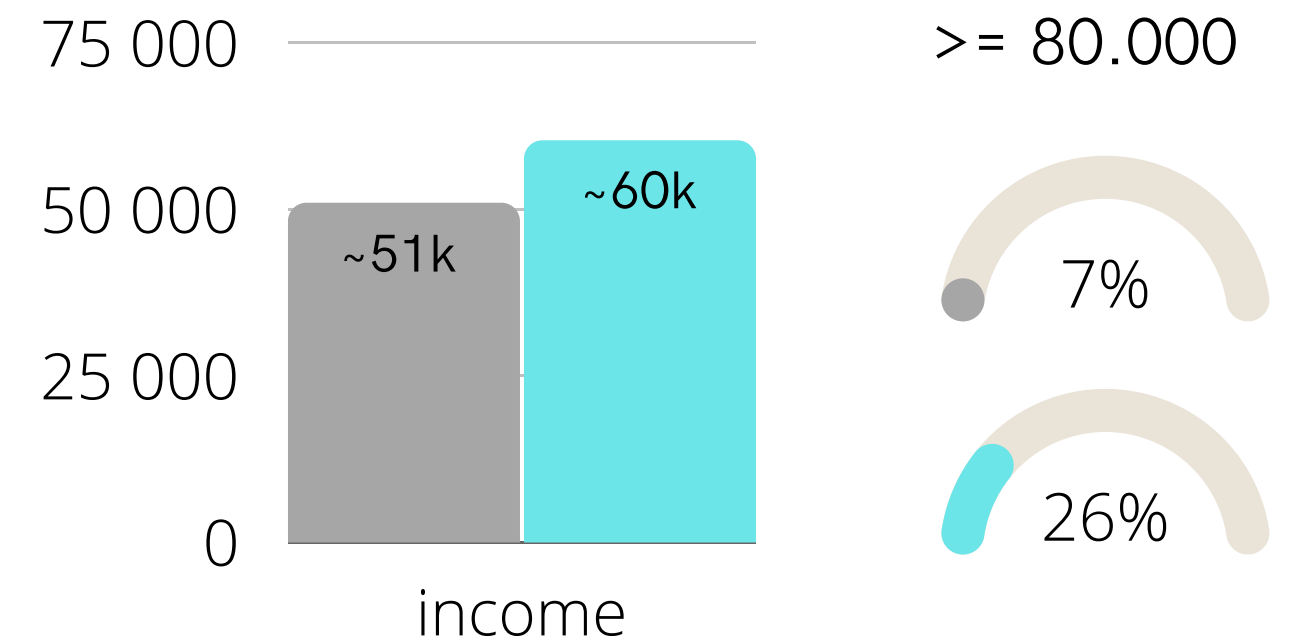
Master 17%



## Annual Income

**52.232**

monetary unit  
(average)



# Cluster Analysis

The cluster analysis task was developed to break the customers into different **groups**, aggregating customers with similar **profiles** and **behavior**.

It resulted in **four** different groups:

- Group 1** The Well-Educated Occasional Shoppers
- Group 2** The Family-Starter Occasional Shoppers
- Group 3** The Traditional Shoppers
- Group 4** The Light Shoppers

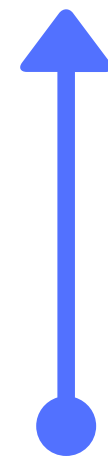


# The Well-Educated Occasional Shoppers

This group is mostly represented by **higher educational degrees**, especially Graduation.

Most of these customers are between 40 and 59 years old, probably **couples** with **no lower-age children**.

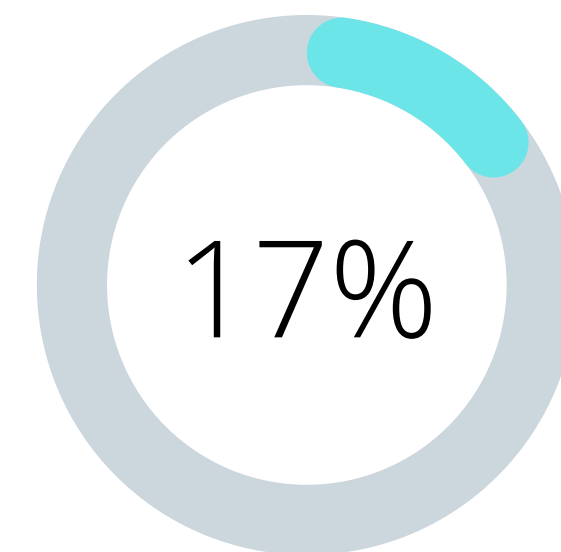
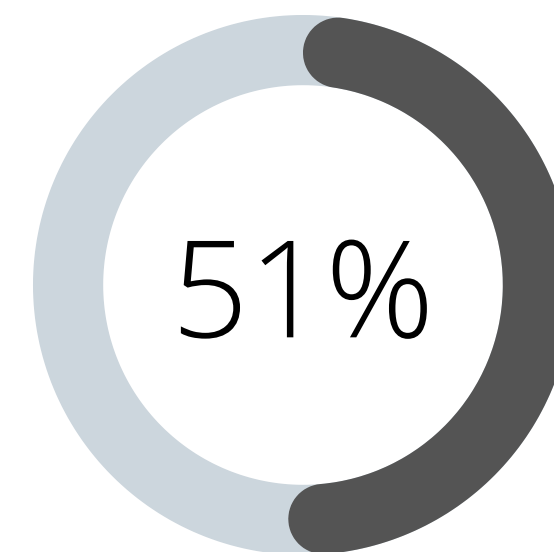
They are associated with medium to high household income. However, the purchase habits are characterized by **lower rates** of monthly **purchases** and monthly **amounts spent** on products.



Education\_Graduation  
Marital\_Status\_Married  
Age\_Group\_50-59  
Age\_Group\_40-49  
Marital\_Status\_Together



Kidhome  
avg\_DealsPrch\_per\_month  
avg\_StorePrch\_per\_month  
avg\_WebPrch\_per\_month  
avg\_FishProds\_per\_month

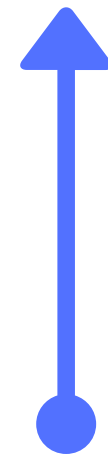


# The Family-Starter Occasional Shoppers

These customers may also have a **Graduation** degree but are mostly represented by a **lower age group**, mostly couples with **lower-age kids**.

Their household **income** is mostly represented by **low to medium values**.

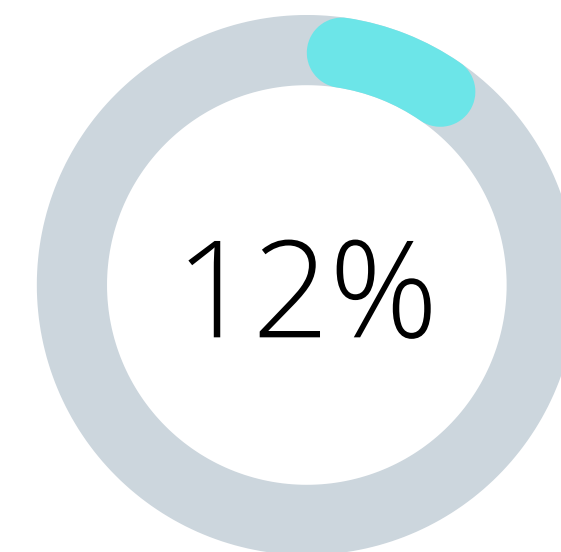
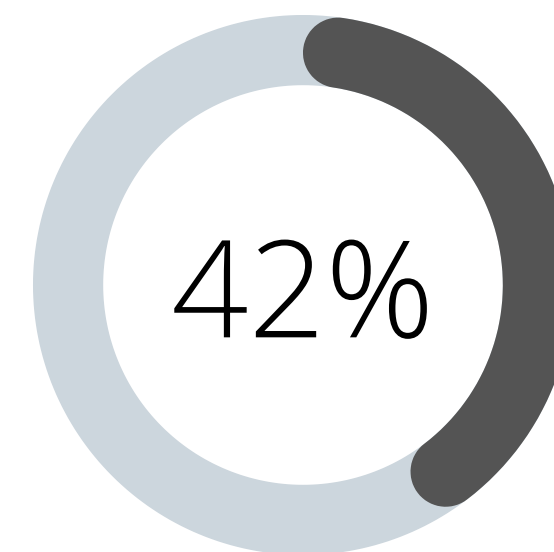
Their purchase habits are also characterized by **lower rates** of monthly **purchases** and monthly **amounts spent** on products.



Kidhome  
Education\_Graduation  
Marital\_Status\_Married  
Age\_Group\_40-49  
Age\_Group\_30-39



avg\_Wines\_per\_month  
avg\_CatalogPrch\_per\_month  
avg\_MeatProds\_per\_month  
avg\_SweetProds\_per\_month  
avg\_StorePrch\_per\_month



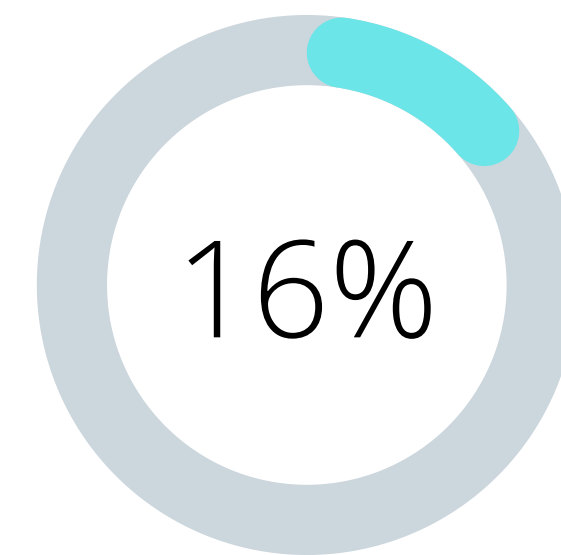
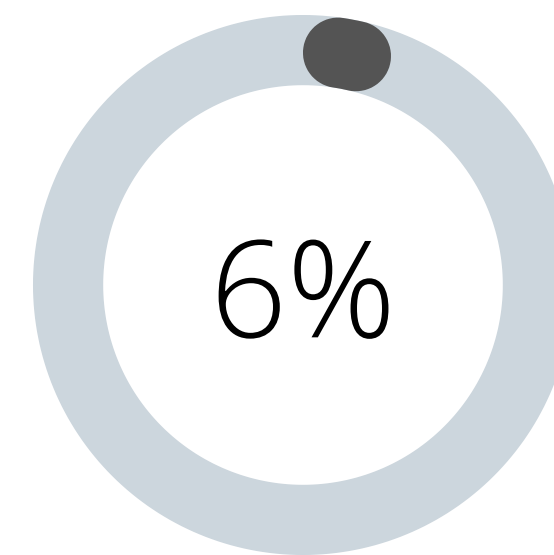
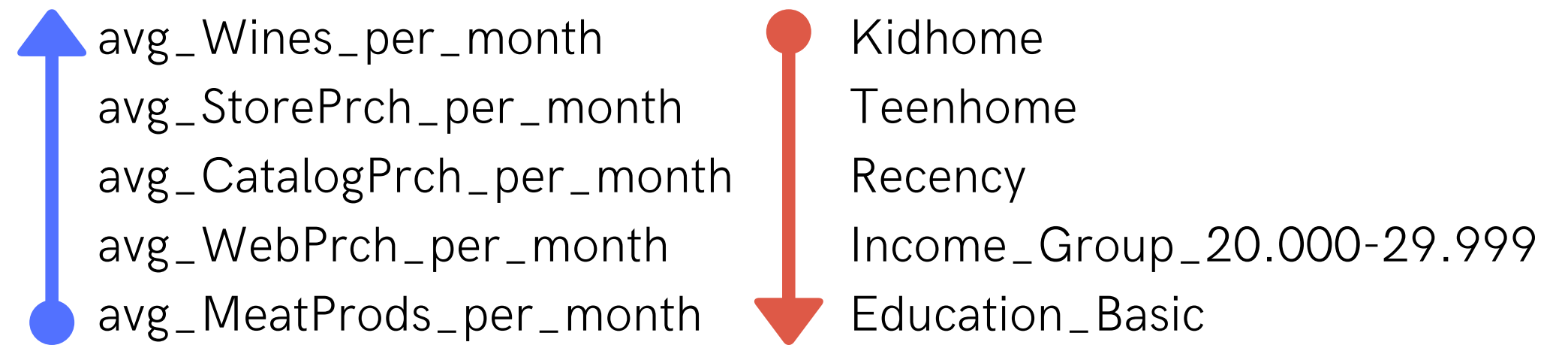


# The Traditional Shoppers

This group is characterized by the **highest rates** of monthly **purchases** and monthly **amounts spent** on products, especially **wines** and **meat**.

The idea of higher rates of purchases is reinforced by the association to **lower values** of the **Recency** feature.

They are mostly represented by customers with **no children**, neither of lower ages nor teenagers.

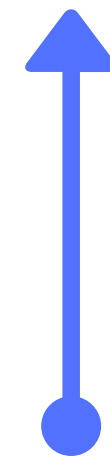


# The Light Shoppers

The Light Shoppers are closely related to the Traditional shoppers. However, instead of wines and meat, they prefer **fish** and **fruits**.

Besides their different preferences, they are also associated with **higher rates** of monthly **purchases** and **amounts spent** on products.

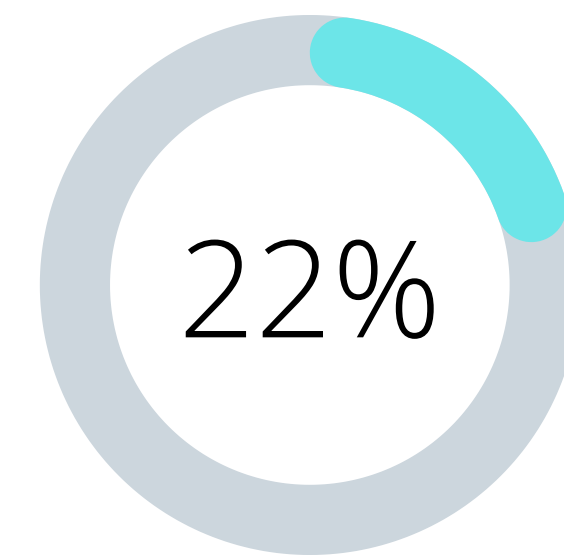
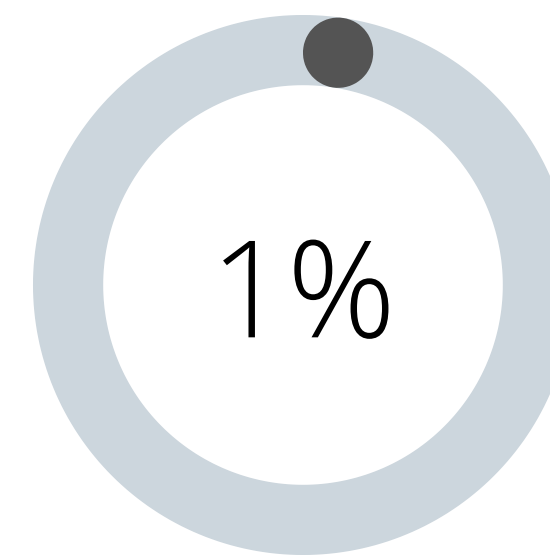
They are also associated with customers with **no children** (low-age kids and teenagers).



avg\_FishProds\_per\_month  
avg\_Fruits\_per\_month  
avg\_MeatProds\_per\_month  
avg\_CatalogPrch\_per\_month  
avg\_GoldProds\_per\_month



Kidhome  
Teenhome  
Recency  
Marital\_Status\_Absurd  
Marital\_Status\_YOLO



# Predicting Campaign Response

## Approaches

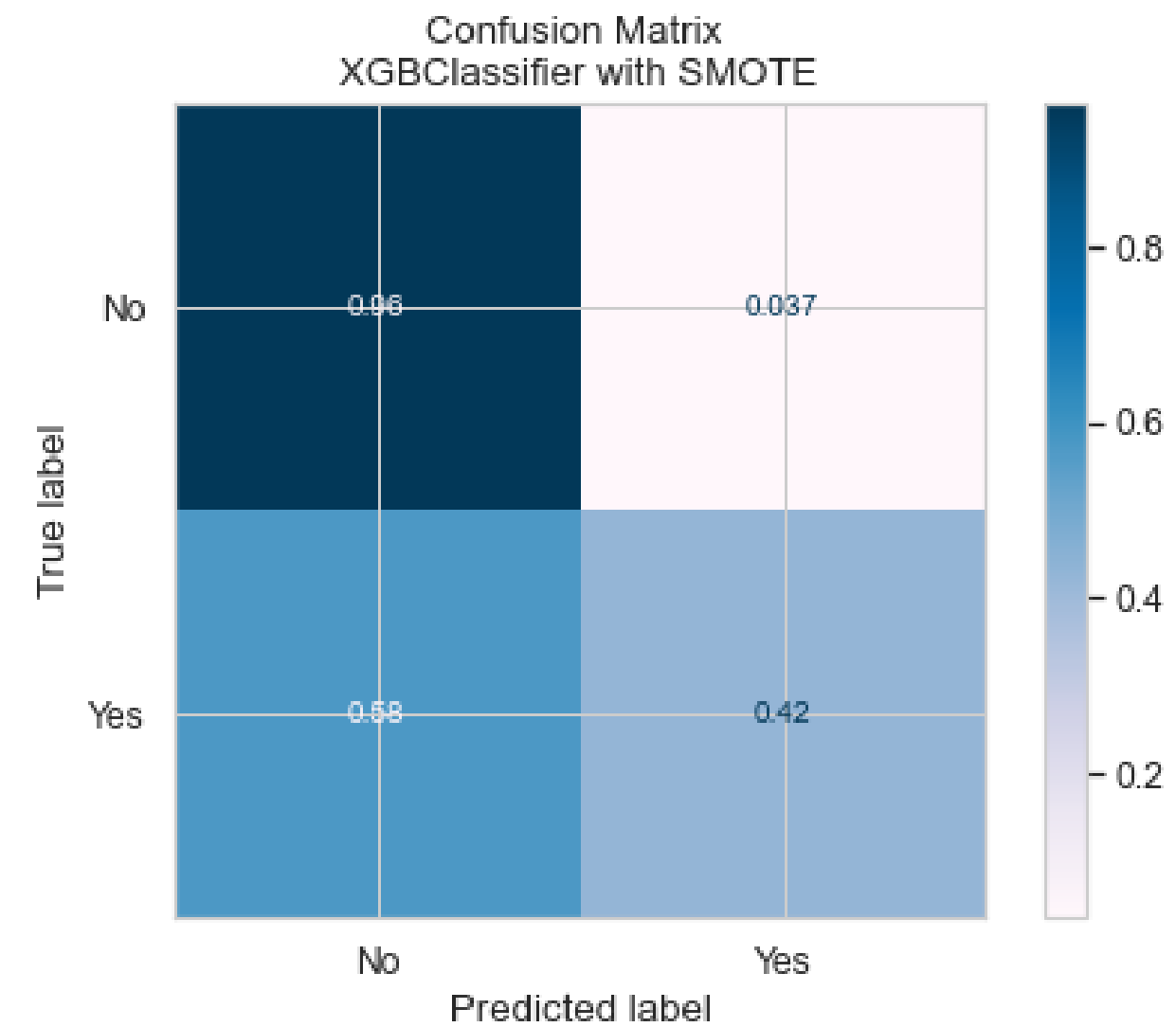
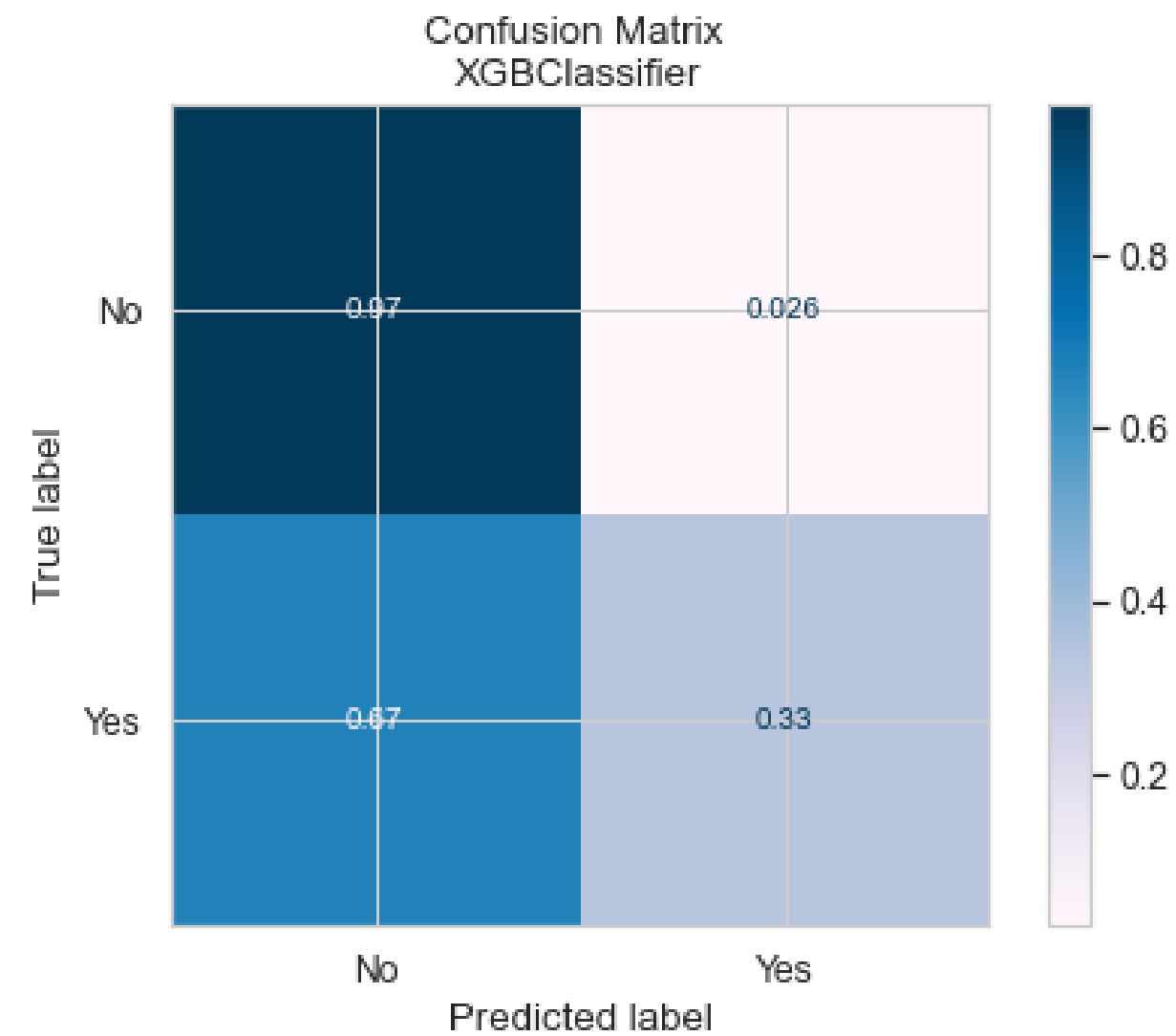
- Training on imbalanced data
- Using SMOTE technique
- ROC\_AUC for evaluation

## Algorithms

- BayesSearchCV
- XGBoostClassifier
- GradientBoostingClassifier



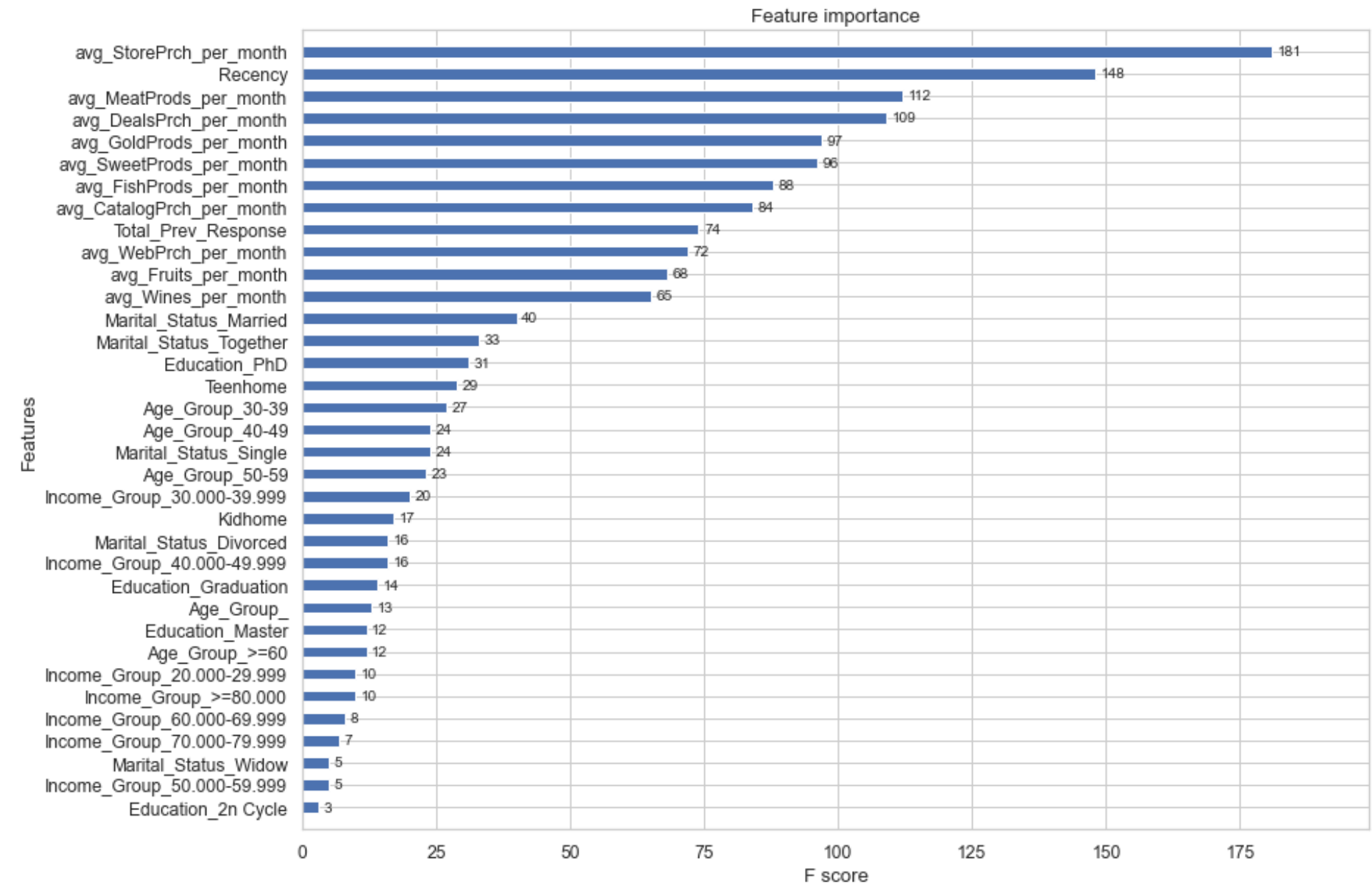
# XGBoost



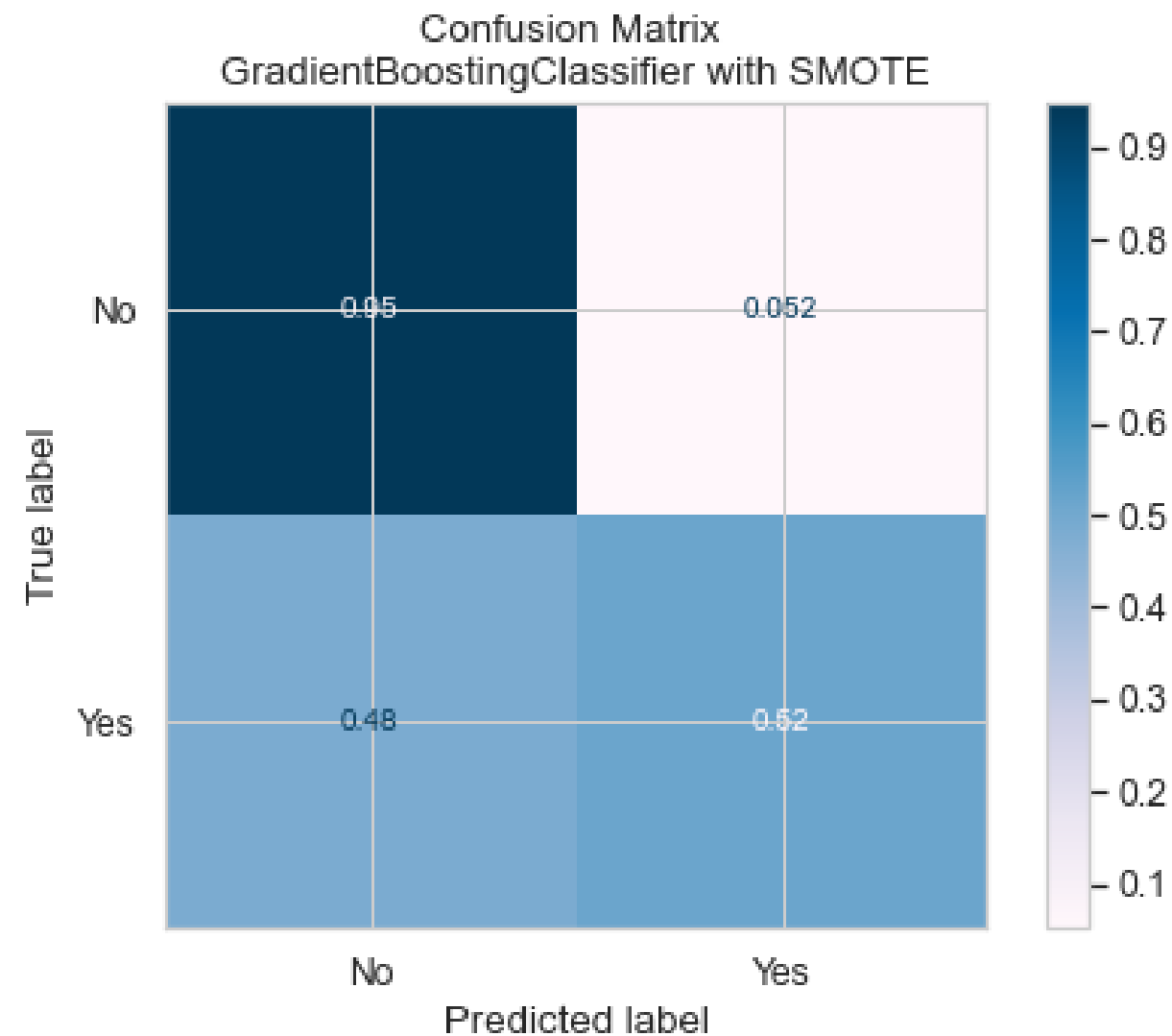
# XGBoost - Feature Importance

The most important features are the ones related to the consumption habits:

- monthly rate purchases
- monthly rate amounts
- recency
- previous response



# GradientBoosting



## Strategy

- run the model over the customer database, computing the **response probability**;
- define a probability **threshold**;
- expose the marketing campaign to the **selected customers**;
- **increase** the campaign **response**;
- **optimize** the **profit**.

# Recommendations

## Mobile App

- easy way to connect to the customers
- campaigns through push up notifications
- promotion and discounts to boost purchases

## Loyalty Program

- encourage frequent purchases to achieve goals and receive bonuses
- the more they buy, the higher the discount
- free tickets for those who bought a certain amount per month



# Questions?

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Thank you!