Team Member Details

Team name: Team Muadh

Member count: 1

- Name: Muadh Faizan
- Email: muadhfaizan@gmail.com
- Country: United Arab Emirates
- Company: Global Management Consultants
- Specialisation: Data Science

GitHub repository link: https://github.com/MuadhF/DG-Projects

Problem Description

The project chosen to be done is the Bank marketing project, which is regarding a term deposit product of a Portuguese bank. The bank wants to sell a term deposit product to its customers but want to know which of their customers will be more likely to buy it, based on the past interactions with the bank. A classification problem is at hand, where the dataset contains information of several customers who were already informed about the term deposit, such as their age, gender, and other information pertaining to their bank accounts and loans. Whether the customer had bought the product or not, is also given for each customer.

The aim of the project is to analyse the dataset and come up with a classification model which would be able to predict if a customer would buy the product or not.

Exploratory Data Analysis

EDA was performed on the dataset. Histograms, count plots, heatmaps, stacked plots, scatterplots and boxplots were all used to understand the data and find any patterns or useful insights.

Key Findings:

- Around 4,000 customers have negative bank balances.
- Majority of customers have not been contacted for a previous campaign.
- Many of the features have outliers, but only few I considered extreme which needed treatment.

- Majority of customers are either blue collar workers, technicians, or in management.
- Most customers are married. Most customers also have at least a secondary education.
- Only 1.8% of customers have credit default.
- Around 55% of customers have a housing loan, but only 16% have a personal loan.
- More customers were contacted through cellular phone than telephone.
- Summer season had the greatest number of customer contacts, in the months of May to August.
- Out of the 18% that were contacted for a previous campaign, only 3.3% were successful in buying the product.
- 11.7% of customers have bought the term deposit. This is an improvement from the previous campaign, it seems.
- The correlation heatmap showed no signs of correlation between any of the features.
- Students are the most likely to buy the product, nearly 30% of student customers had bought the term deposit. They are followed by retired and unemployed customers.
- Single customers are slightly more likely to buy than divorced or married customers, but there is not much difference in conversion rate.
- Customers with tertiary education are more likely to buy the product.
- Customers with no credit default, or no personal loan or no housing loan are generally twice more likely to purchase the product.
- Method of communication doesn't seem to have much of an impact on whether the customer buys or not.
- The 'month' can be used for insights because we would not expect a period of more than one month for the customer to make a decision. The only caveat is if the first contact is at the end of a month and then continues to the next month. Regardless, March, December, September and October have the highest conversions of close to 50%. The reason for this is unclear.
- Customers who bought the product in the previous campaign, are far more likely to buy the term deposit. Around 50% of them made the purchase in the current campaign.
- Customers who bought the product tend to have higher bank balances.
- Customers who bought the product had their last call of a larger duration, but since it is their last call, we cannot get much insight into this. It may have been a longer call because of the purchase.
- Among retirees, older customers (~ 65 years) tended to buy the product rather than younger (~ 55 to 60 years) customers.

Recommendations

The following target audience profile can be created from the findings:

- Age between 30 to 50 years
- Positive bank balance slightly on the higher side
- Have tertiary education
- Is a student or retiree
- No credit defaults
- No personal loan
- No housing loans
- Purchased product on previous campaign

Other recommendations include:

- The bank should try to improve their marketing and try to get the customer to confirm the purchase as early as possible, because as the number of contacts increase for the campaign, very few conversions took place.
- The months of March, September, October, and December had the highest conversion rates. The bank can look into this and investigate the reason, and if it is not a random occurrence, then the bank can focus most of their marketing in these months. It could, however, be related to the product itself.
- The bank should segment their customers, based on their loyalty and interactions and tailor their services to them.