

Group Name: The Greeks

Name: Michalis Galanakis

Email: mihalisgalanakis@hotmail.com

Country: Greece

College/Company: Athens University of Economics and Business

Specialization: Data Science

GitHub Repo Link: <https://github.com/mihalis2412/Bank-Marketing-Campaign>

Problem Description: ABC Bank wants to sell its term deposit product to customers. Before launching the product, they want to develop a model which will help them understand whether a particular customer plans to buy their product or not (based on customer's past interaction with the bank or other Financial Institution).

EDA: Firstly, we run the code from the previous assignment in order to handle the missing values. Then, we start our analysis by presenting the distributions of our data. To do this, we create some boxplots and bar plots to present the number of outliers and whether the data is normal distributed. The results showed that we have unbalanced data, following non normal distribution with lots of outliers. Next, we provide a summary of the numerical variables and the number of consumers that subscribed or not a term deposit, including both a table and a bar plot. As we can see there are 36548 consumers that did not subscribe a term deposit and 4640 who did. Finally, we proceed with the following assumptions to examine the relationship between the output variable and some of the rest of the features. For that reason, each of the assumptions provide a graph (scatterplot for numerical variables and bar plot for the categorical ones) to clarify this relationship.

1) Number of consumers based on age

In the first graph we can observe that from the ages 20 to 60 there is significant difference between the ones who submitted and the others who did not. Note that at the age of 30, we observe the pick for both of these categories.

2) Number of consumers based on education

In this graph we can see that those with university degree have the highest number of consumers for both of those who subscribed and for those who did not. The proportion of each category of education does not seem to have significant difference.

3) Number of consumers based on last contact month of year (Seasonality)

In this graph we observe that in May we have by far the most last contracts in both cases. This result means that we have seasonality. However, in months such as December, March, October and November there are small differences between

these two cases. Thus, these months may result in a consumer who might subscribe in a term deposit when we deploy our Machine Learning model.

4) Number of consumers based on type of job

In this graph we have admin and blue-collar with the highest number of consumers. However, in all categories of job we have the same proportion for both of those who subscribed and for those who did not.

5) Total Number of Consumers' Price Index

This graph shows that in the case of those who subscribed we have no differences. However, in those who did not, it seems that in 93.5 and 94.0 price we have the highest number of consumers.

6) Number of Consumers' last contact duration

From this graph, we can infer plenty of interesting observations. The most important one, is that in most cases of those who subscribed, the duration of the last contract is approximately zero, hence there was no last contract. This outcome is also confirmed by the fact that those who did not subscribe, had long duration in their last contract and decided not to subscribe after that, implying a clear dissatisfaction. As there are lots of 0 inputs in this variable, we may exclude it in our final model.

7) Number of Consumers based on the Outcome of Previous Marketing Campaign

In our final graph, we can detect a clear difference in the categories, since non-existent have over of 30000 consumers who did not have previous marketing campaign. In addition, as we expected, those who had a previous campaign, and it was successful they finally decided to subscribe in a term deposit.

EDA recommendation:

The whole analysis showed that duration, month, outcome and age may have important role for the ABC bank to sell their term deposit to the customers.