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**GitHub Repo Link:** https://github.com/AGGELOS-KONIORIS/Week_10_deliverables

**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 analysis:** Firstly, we run the code from the previous assignment for handling the missing values. Then, we start out analysis by presenting the distributions of our data. For this step we create some boxplots and some bar plots to show the number of outliers and whether the data is normal distributed or not. The results showed that we have unbalanced data, following no normal distribution and 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 with 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 do. Finally, we procced with the following assumptions in order 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 barplot for categorical variables) to clarify this relationship.

**1) Number of consumers based on age**

In the first graph we can see that from the ages 20 to 60 there is significant difference between the ones who submitted and the others who do not. We also observe that at the age of 30 we observe the pick of 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 do not. The proportion of each category of education one seems not to have any differences.

**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 we have small differences between these two cases. Thus, these months may result in a consumer who may subscribe in a term deposit in 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 do not.

**5) Total Number of Consumers' Price Index**

This graph shows that in the case of those who subscribe we have no differences. However, in those who do 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**

In this graph, we can observe lots of interesting things. The most important is that in most cases of those who subscribe the duration of the last contract is very cloze to zero implying that we have no last contract. This outcome is also confirmed by the fact that those who do not subscribe, had long duration in their last contract and decide not to subscribe after that, implying a clear dissatisfaction. As we have 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 see a clear difference in the categories, since nonexistent have over of 30000 consumers who do not have previous marketing campaign. In addition, as we expected, those who have a previous campaign and it was successful they finally decide to subscribe in a term deposit.

## EDA recommendation:

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