Introduction

In the banking sector, the evolution of specialized bank marketing has been driven by the expansion and intensification of the financial sector, introducing competition and transparency. Banks recognize the necessity of professional and efficient marketing strategies to engage with increasingly informed and critical customers, particularly in conveying the complexity and abstract nature of financial services. The precision of reaching specific locations, demographics, and societies has remained a complex task. Machine learning has revolutionized this landscape by using data and analytics to inform banks about which customers are more likely to subscribe to a financial product. In this project on bank marketing with machine learning, we delve into how a particular Portuguese bank can use predictive analytics to strategically prioritize customers for subscribing to a bank term deposit, thereby showcasing the transformative potential of machine learning in refining marketing strategies and optimizing customer targeting for financial institutions.

Data

Our project delves into the realm of direct marketing campaigns conducted by a prominent Portuguese banking institution. These campaigns revolved around phone calls and were designed to gauge the likelihood of clients subscribing to a bank term deposit. The extensive dataset at our disposal offers a comprehensive view of these marketing endeavors, providing valuable insights into the factors influencing clients' subscription decisions.

The dataset we are using is the following:

bank-full.csv with all examples and 17 inputs, ordered by date (older version of this dataset with less inputs).

The primary objective of our analysis is classification, with a focus on predicting whether a client will subscribe ('yes') or not ('no') to a term deposit. This predictive task is central to understanding the dynamics of client behavior in response to the bank's direct marketing initiatives. The variable 'y' serves as the target for our classification models, encapsulating the binary outcome of the subscription decision. Through rigorous exploration of these datasets, we aim to uncover patterns and trends that can inform and enhance the effectiveness of future marketing campaigns.

Analysis

In this study, one of the algorithm employed is Logistic Regression, known for its capability to unveil connections between binary dependent variables and one or more continuous explanatory variables. Utilizing a maximum probability approximation method [3], Logistic Regression calculates the probability of the sample arising from a population with initial values of predicted parameters. Subsequently, the estimated parameters undergo iterative adjustments until the highest probability value is reached [7]. Essentially, the maximum probability approach aims to pinpoint parameter estimations that render the observed data "most probable" [9]. Given the dataset's composition, featuring continuous independent variables and a binary dependent variable, Logistic Regression emerges as a fitting classifier for predicting customer subscription in the bank's telemarketing campaign for term deposits.

References

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Predicting Customer Response to Bank Direct Telemarketing Campaign

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