

Analysis Overview

The goal of the analysis was to predict whether a client would subscribe to a term deposit using the provided datasets. The focus was on creating a predictive model and extracting actionable insights for improving subscription rates.

Methods used during EDA

Key features were identified, and categorical variables such as job, marital, education, and contact were hot-encoded. However, the data was examined for class imbalanced, then scaled and normalized.

Key Insights and Findings

Important features

There are certain features in the new preprocessed dataset that influenced the prediction outcome of the model, and these are duration, contact, and campaign. The length of the last call is highly predictive, as longer call durations with the bank often imply a higher likelihood of subscription. Also, attributes such as job and education provide additional insights into client behavior.

In all, duration was the most influential feature in the model, emphasizing the importance of meaningful interactions during calls. The customer service of this bank did a good job.

Common characteristics of clients likely to subscribe:

- Those who contacted less frequently, but had longer calls.
- Clients who had been previously contacted with positive outcomes.
- Clients who in a certain profession such as management, were likely subscribers.

Model Building and Evaluation:

Model Building:

Random Forest Classifier was the main machine learning algorithm used in building the model.

Model Evaluation:

Metrics like Accuracy, precision, Recall, and F1 Score were used to evaluate the overall performance of the model.

Final Random Forest Model Performance:

Accuracy: 94%

Precision: 97%

Recall: 97%

F1 Score: 97%

Recommendations for Marketing team of the bank

1. They should target high-probability groups by focusing on clients with a history of positive interactions, and also prioritize campaigns for retirees and clients in higher-income jobs.
2. The customer service department should also focus on extending call durations where feasible, and focus on personalized follow-ups for previously successful contacts.
3. As a data analyst at the bank, I will continue collecting and analyzing client interaction data for better predictions.