

Predicting Term Deposit Subscription by a client

Abstract:

Marketing campaigns are characterized by focusing on the customer needs and their overall satisfaction. Nevertheless, there are different variables that determine whether a marketing campaign will be successful or not. There are certain variables that we need to take into consideration when making a marketing campaign.

A Term deposit is a deposit that a bank or a financial institution offers with a fixed rate (often better than just opening a deposit account) in which your money will be returned back at a specific maturity time.

Problem Statement:

Predict if a customer subscribes to a term deposit or not, when contacted by a marketing agent, by understanding the different features and performing predictive analytics

Dataset Information:

The data is related with direct marketing campaigns of a Portuguese banking institution. The marketing campaigns were based on phone calls. Often, more than one contact to the same client was required, in order to assess if the product (bank term deposit) would be ('yes') or not ('no') subscribed.

The dataset consists of several predictor variables and one target variable, Outcome. Predictor variables includes the age, job, marital status, and so on

Variable Description:

Column	Description
age	Age of the client

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job	Type of job (categorical: 'admin.', 'blue-collar', 'entrepreneur', 'housemaid', 'management', 'retired', 'self-employed', 'services', 'student', 'technician', 'unemployed', 'unknown')
marital	Marital status (categorical: 'divorced', 'married', 'single', 'unknown'; note: 'divorced' means divorced or widowed)
education	(categorical: 'basic.4y', 'basic.6y', 'basic.9y', 'high.school', 'illiterate', 'professional.course', 'university.degree', 'unknown')
default	has credit in default? (categorical: 'no', 'yes', 'unknown')
housing	has a housing loan? (categorical: 'no', 'yes', 'unknown')
loan	has a personal loan? (categorical: 'no', 'yes', 'unknown')
contact	contact communication type (categorical: 'cellular', 'telephone')
month	last contact month of year (categorical: 'jan', 'feb', 'mar', ..., 'nov', 'dec')
day_of_week	last contact day of the week (categorical: 'mon', 'tue', 'wed', 'thu', 'fri')
duration	last contact duration, in seconds
campaign	number of contacts performed during this campaign and for this client (numeric, includes last contact)
pdays	number of days that passed by after the client was last contacted from a previous campaign (numeric; 999 means client was not previously contacted)
previous	number of contacts performed before this campaign and for this client
poutcome	outcome of the previous marketing campaign (categorical: 'failure', 'nonexistent', 'success')
emp.var.rate	employment variation rate - quarterly indicator (numeric)
cons.price.idx	consumer price index - monthly indicator
cons.conf.idx	consumer confidence index - monthly indicator

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euribor3m	euribor 3 month rate - daily indicator
nr.employed	number of employees - quarterly indicator
y	has the client subscribed a term deposit? (binary: 'yes','no')

Expectations and Evaluation:

Candidates are expected to perform data preprocessing tasks, split the data into train and test, build a model upon training data (70%) and evaluate the model on the test data (30%). Use the random_state=10 while splitting the data.

Candidates are expected to apply multiple algorithms to build the model, evaluate the model using various performance metrics and justify which is the best algorithm suitable for the data.

Learning Outcome:

The students will get a better understanding of how the variables are linked to each other and should be able to predict whether a client of a bank will subscribe to a term deposit or not such that banks can plan the different campaigns for different customers according to the patterns.