

Machine Learning / Data Science
Coding Problem 1
for Selection towards Developer Position – 2017



Guidelines:

- Send your answer within **5 days** from the receipt of this mail.
- You can send us the ZIP file with the source code.
- Showcase your best coding practices, and document your code well. The code should be efficient and optimized, object-oriented, modular etc.
- Write your answers in **Python programming** language **ONLY**.
- **Code Plagiarism will lead to immediate disqualification**

Problem Statement : Marketing Analytics

The problem mentioned below uses the data attached to the mail you have received, along with this document.

Problem:

The data provided contains details of direct marketing campaigns of a banking institution. The marketing campaigns were based on phone calls. Often, multiple contacts were required to be made to the same client to successfully sell the product(bank term deposit). You are required to build a **binary classification Machine Learning model** that will predict(yes/no) if a client will subscribe to the product, given his/her demographic and marketing campaign related information.

Solution Requirements

As part of this assignment, you are expected to showcase the following stages of model building:

1. Data Exploration.
2. Feature Engineering (Creation of new Features from existing Features).
3. Feature Selection.
4. Model Training (Parameter tuning, ensembling etc).
5. Model Selection based on appropriately calculated metrics.
6. Create a brief one page report on your approach and final performance of your model.

Data set description

Filename: **marketing-data.csv**

Field Descriptions:

Field Name	Description
age (numeric)	age of the client
job	Type of job
marital	marital status
default	Has credit in default?
education	Highest Education Qualification
balance	Average yearly balance, in euros
housing	Has client have any house loan?
loan:	Has client have personal loan?

Fields related to the contact of the current campaign

contact	contact communication type
day	last contact day of the month
month	last contact month of year
duration	last contact duration, in seconds

other attributes

campaign	number of contacts performed during this campaign and for this client
pdays	number of days that passed by after the client was last contacted from a previous campaign
previous	number of contacts performed before this campaign and for this client
poutcome	outcome of the previous marketing campaign

Label Variable

is_success	has the client subscribed a term deposit?
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