

Week 7 Deliverables

Group Name: Carpe-Diem group

Specialization: Data Science

**Project Name: Bank Marketing (Campaign) --
Group Project**



Team Members:

1.Name: Mohini Kalbandhe

- **Email:** amohini099@gmail.com
- **Country:** Canada
- **Company:** Happy Orchard
- **Specialization:** Data science

2.Name: Kashish Joshipura

- **Email:** kashishjoshipura@gmail.com
- **Country:** Canada
- **Collage:** The University of British Columbia (UBC)
- **Specialization:** Data Science

3. Name:

- **Email:**
- **Country:**
- **Company:**
- **Specialization:**

4. Name:

- **Email:**
- **Country:**
- **Company:**
- **Specialization:**

Bank Marketing (Campaign)

Problem Statement:

ABC Bank wants to sell its term deposit product to customers and before launching the product they want to develop a model which help them in understanding whether a particular customer will buy their product or not (based on customer's past interaction with bank or other Financial Institution).

Problem description:

One of the most common marketing strategy In Banking sector is direct marketing campaigns through phone calls ,it is a form of advertising that allows organizations to communicate directly with customers to offer their services based on the client's existing bank profile .Here we will consider term deposit as a banking service .

Business Goal :

To build a list of target customers who are likely to subscribe a term deposit. The more targeted our campaigns, the more successful they are likely to be.

Project Objective:

By converting this problem into a machine learning classification problem we will build a model to predict whether a client will subscribe a term deposit or not so that the banks can arrange a better management of available resources by focusing on the potential customers “predicted” by the classifier .

Technique to be used: Classification

Business Scope:

- Forecasting the profit which the term deposit product brings.
- Analyzing customers interactions with ABC bank and other financial institutions.
- Use the outcome value (y/n) to track the number of customers who would subscribe to the term deposit product in order to predict its performance in the market.
- Analyze which customers would be more likely to buy the product. (eg. Married, divorced etc.)
- Help the ABC convey how the product ties with the customer's benefits.

Data Set 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 access if the product (bank term deposit) would be ('yes') or not ('no') subscribed.

Attribute Information:

Bank client data:

- Age (numeric)

- **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 housing loan? (categorical: 'no', 'yes', 'unknown')
- **Loan**: has personal loan? (categorical: 'no', 'yes', 'unknown')

Related with the last contact of the current campaign:

- **Contact**: contact communication type (categorical: 'cellular','telephone')
- **Month**: last contact month of year (categorical: 'jan', 'feb', 'mar', ..., 'nov', 'dec')
- **Dayofweek**: last contact day of the week (categorical: 'mon','tue','wed','thu','fri')

- **Duration:** last contact duration, in seconds (numeric).
Important note: this attribute highly affects the output target (e.g., if duration=0 then y='no'). Yet, the duration is not known before a call is performed. Also, after the end of the call y is obviously known. Thus, this input should only be included for benchmark purposes and should be discarded if the intention is to have a realistic predictive model.

Other attributes:

- **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 (numeric)
- **Poutcome:** outcome of the previous marketing campaign (categorical: 'failure','nonexistent','success')

Social and economic context attributes

- **Emp.var.rate:** employment variation rate - quarterly indicator, it defines as a measure of the extent to which available labor resources (people available to work) are being used. (numeric)
- **Cons.price.idx:** consumer price index - monthly indicator (numeric), it expresses the change in the current prices of

the market basket in terms of the prices during the same month in the previous year.

- **Cons.conf.idx**: consumer confidence index - monthly indicator , CCI is a survey administered by The Conference Board, that measures how optimistic or pessimistic consumers are regarding their expected financial situation (numeric)
- **Euribor3m**: euribor 3 month rate - daily indicator (numeric), it is the interest rate at which a selection of European banks lend one another funds denominated in euros whereby the loans have a maturity of 3 months
Nr.employed: number of employees - quarterly indicator (numeric)

Output variable (desired target):

- **y** - has the client subscribed a term deposit? (binary: 'yes', 'no')

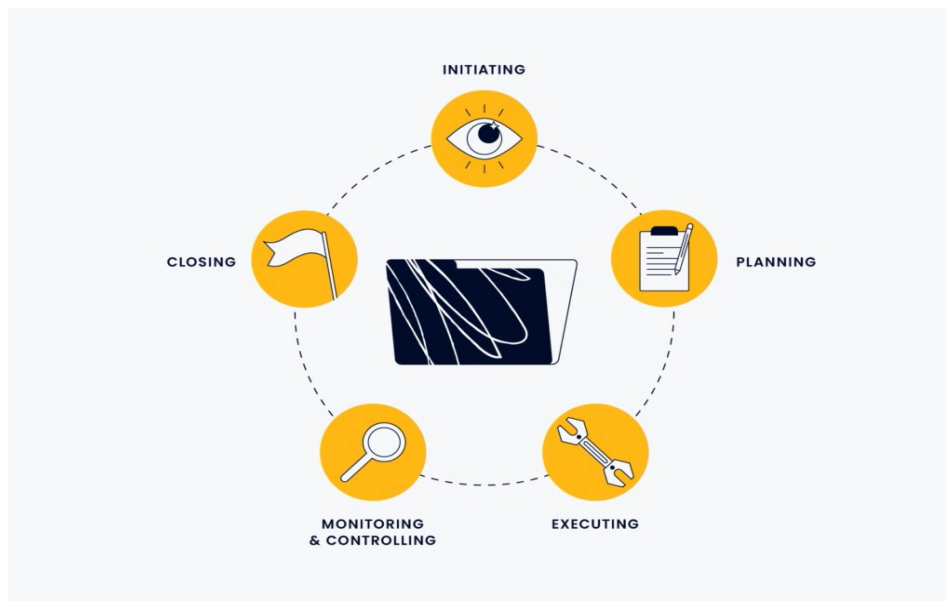
Business understanding:

- Portuguese Bank wants to improve marketing campaign to recommend which customer is to target by analyzing their past marketing data.
- The Motivation is by devising such prediction algorithm the bank can be a better target for its customer and better channelize its customer.

- Bank of Portugal offered its customer fixed term products such as CD's. Data was collected about each client, type of contact and outcome.
- How does Predicting term deposit tie in with its mission and vision?
- How do the visual design and marketing copy of data help convey the Marketing success of this campaign?
- The Goal can be achieved by using ML algorithm will use customer records to predict future action to reduce company's time and recourses.

Project lifecycle along with deadline:

Project lifecycle is a highfalutin way of describing the life of a project. Following are the high-level process of delivering a project and the steps to take a project and conduct a team from brief through to delivery.



1. Project Initiation:

Tasks	Deadlines
<ul style="list-style-type: none">○ Have a research and understanding on Bank business.○ Problem statement, project goal and data variables understanding.○ To provide business insights and solutions to issues in the data.	Week 7 and 8: 19 th July 2022 26 th July 2022

2. Project Planning:

<ul style="list-style-type: none">○ Prepare data acquisition and data cleaning solution.○ Create a python file with exploratory data analysis and power point presentation of the same.○ Find the best solution and algorithm for data.	Week 9, 10 and 11. 2 nd August 2022 9 th August 2022 16 th August 2022
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3. Project Execution:

<ul style="list-style-type: none">○ Try to apply different possible algorithms○ Test the algorithm in different categories○ Compare algorithms based on their performances.○ Choose the best possible algorithm for model.	Week 12: 23 rd August 2022
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4. Project Closure:

<ul style="list-style-type: none">○ With best possible algorithm create a final project model.○ Create a power point presentation for final project.	Week 13: 30 th August 2022
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Github Repo link:

“<https://github.com/amohini099/Banco-de-portugal-marketing>”