

# CUSTOMER SEGMENTATION AND DEPOSIT DETECTION SYSTEM CASE STUDY





# NEXUS BANK CASE STUDY



# ABOUT US

**Nexus Bank** is a financial institution dedicated to delivering unparalleled banking services to our clients. Our mission is to establish enduring relationships with our customers by providing tailored financial solutions that align with their individual needs and goals.

At **Nexus Bank**, we believe that every individual deserves access to world-class financial products and services, regardless of their age, profession, or income level. That's why we offer a wide spectrum of banking solutions to accommodate your lifestyle, including term deposits, personal loans, and mortgage financing.

Our team of seasoned banking professionals is committed to providing you with the utmost level of service, transparency, and honesty.

*We pride ourselves on being more than just a bank – we are your lifelong financial partner.*





## PROBLEM OVERVIEW

**Nexux bank** has conducted campaigns with the goal of acquiring deposits. In the last board meeting, the directors where unsatisfied with their current situation and need to optimize the operations at **Nexus bank**.

**The Director of Nexux** contacted you a Data Scientist because they are interested in leveraging the power of their data to gain insights into the bank and improve their efficiency. They want to identify patterns and trends in customer behavior to decipher if customer demographics such as age, educational level e.t.c influences customers attitude toward defaulting. The board specifically wants to anticipate future customer behavior and know the likelihood of subscription to term deposits from customers.

**Nexux** wants to understand how effective their campaigns are and thus develop marketing campaigns to reach specific customer segments. By analyzing customer behaviors, loan trends, and marketing campaign effectiveness, Nexus wants to optimize its operations, mitigate risks/ loan defaults, and improve customer subscription to term deposits.



**NOTE:** ***Term Deposits** are a type of investment or savings product where individuals deposit a specific amount of money for a fixed period of time, known as the term or maturity period.*





# DATA DICTIONARY

- **Age:** This refers to the age of the customer who holds the bank account.
- **Job:** This feature indicates the type of job that the customer has.
- **Marital:** This feature indicates the marital status of the customer, which could be "married," "divorced," or "single".
- **Education:** This refers to the education level of the customer, which could be "primary," "secondary," or "tertiary."
- **Default:** This feature indicates whether the customer has previously defaulted on a loan or credit card payment, which could be "yes" or "no."
- **Balance:** This feature represents the current balance in the customer's account.
- **Housing:** This feature indicates whether the customer has a housing loan or not, which could be "yes" or "no."
- **Loan:** This feature indicates whether the customer has a personal loan or not, which could be "yes" or "no."
- **Contact:** This feature indicates the method of contact used to reach out to the customer, which could be "cellular," "telephone," or "unknown."
- **Day:** This feature represents the day of the month when the customer was last contacted.
- **Month:** This feature represents the month of the year when the customer was last contacted.
- **Duration:** This feature represents the duration of the last contact with the customer, in seconds.
- **Campaign:** This feature represents the number of contacts made to the customer during this campaign.
- **Pdays:** This feature represents the number of days that passed by after the customer was last contacted from a previous campaign.
- **Previous:** This feature represents the number of contacts made to the customer before this campaign.
- **Poutcome:** This feature indicates the outcome of the previous marketing campaign, which could be "success," "failure," or "unknown."
- **Deposit:** This feature indicates whether the customer has subscribed to a term deposit, which could be "yes" or "no."



# CAPSTONE PROJECT ANALYSIS

1. **Problem definition:** clearly articulate the problem that is to be solved with your data mining. How will the bank benefit from your solution?
2. **Perform exploratory data analysis in python:**
  - a) Visualize relationships between the label and some key features
  - b) Explore correlations
  - c) Conduct univariate and multivariate analysis as much as is feasible
3. **Perform feature engineering:**
  - a) Encoding categorical variables
  - b) Create new features from existing features where necessary, depending on insights from your EDA
4. **Model selection, training, and validation:**
  - a) Train and test at least 2 supervised learning model
  - b) Train unsupervised learning model to group customer demographics and behavioral patterns
5. **Model evaluation:**
  - a) Analyse the results of your trained model
  - b) What metrics are most important for the problem? For instance, should the business be more concerned with better results on false negatives or true positives?
6. **Submission;**
  - a) Publish your Jupyter notebook to your Github profile
  - b) In the readme file, include a description of the project and summarize the steps you took and challenges you faced.
  - c) share the link with your instructor.





**Perform your ML task and  
Upload your code into your  
Github Repo.**

**Share link with @10Alytics  
and be prepared for a  
10mins presentation**