This code aims to perform a detailed analysis and classification task on the marketing of a Portuguese banking institution to predict whether a client will become a customer. First, I imported all the libraries necessary for visualization and data manipulation, including pandas, NumPy, matplotlib, seaborn, and various modules from sklearn. The dataset is loaded from a CSV using pd.read\_csv, then displayed the first few rows with df.info() to get the headers of the columns and also understand the data structure, while df.duplicated().sum() and df.isnull().sum() check for duplicates and missing values respectively. for the EDA , I used pair plot to visualize the relationship between variables using sns.pairplot and histograms to understand their distribution. The categorical variables are encoded using one-hot encoding using pd.get\_dummies, and the target variable 'y' is mapped to binary values. The dataset is then split into training and testing sets. Correlation matrices are computed for numerical features in both the original and encoded datasets. Tried three machine learning models: Logistic Regression, Random Forest, and Decision Tree to train and evaluate for accuracy and classification performance which came out 90% for Logistic Regression, and 88% for both Random Forest and Decision Tree. I then used Grid Search to optimize the hyperparameters of the Decision Tree model which came out with a 2% increase resulting in the final accuracy of 90%.