CREDIT CARD DEFAULT CLASSIFICATION

High Level Design

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NOVEMBER 2, 2023

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1.INTRODUCTION

1.1 Why this High Level Design Document?

High-level design (HLD) explains the architecture that would be used to develop a system. The architecture diagram provides an overview of an entire system, identifying the main components that would be developed for the product and their interfaces.

1.2 Scope of High Level Design Document

The High-Level Design documentation presents the structure of the system as the application/database architecture, application flow, and technology architecture. High-Level Design documentation may use some non-technical terms, unlike low-level design which should be strictly technical jargon.

2. PROJECT DESCRIPTION

2.1 PROBLEM STATEMENT

Financial threats are displaying a trend about the credit risk of commercial banks as the incredible improvement in the financial industry has arisen. In this way, one of the biggest threats faces by commercial banks is the risk prediction of credit clients.

2.2 PROPOSED SOLUTION

Machine learning is a field in computer science aiming to imitate the human learning process. Machine Learning is a branch of Artificial Intelligence where computer learns from the data (past experiences) and makes future prediction. It finds the pattern in data, based on pattern it predicts for unseen data. Here we will develop machine learning models to predict the probability of credit default based on credit card owner's characteristics and payment history.

2.3 DATA INFORMATION

The dataset was taken from Kaggle (

URL: https://www.kaggle.com/uciml/default-of-credit-card-clients-dataset),
This dataset contains information on default payments, demographic factors, credit data, history of payment, and bill statements of credit card clients in Taiwan from April 2005 to September 2005.

Attribute Information:

ID: ID of each client

LIMIT_BAL: Amount of given credit in NT dollars (includes individual and family/supplementary = credit)

SEX: Gender (1=male, 2=female)

EDUCATION: (1=graduate school, 2=university, 3=high school, 4=others, 5=unknown, 6=unknown)

MARRIAGE: Marital status (1=married, 2=single, 3=others)

AGE: Age in years

PAY_0: Repayment status in September, 2005 (-1=pay duly, 1=payment delay for one month, 2=payment delay for two months, … 8=payment delay for eight months, 9=payment delay for nine months and above)

PAY_2: Repayment status in August, 2005 (scale same as above)

PAY_3: Repayment status in July, 2005 (scale same as above)

PAY_4: Repayment status in June, 2005 (scale same as above)

PAY_5: Repayment status in May, 2005 (scale same as above)

PAY_6: Repayment status in April, 2005 (scale same as above)

BILL_AMT1: Amount of bill statement in September, 2005 (NT dollar)

BILL_AMT2: Amount of bill statement in August, 2005 (NT dollar)

BILL_AMT3: Amount of bill statement in July, 2005 (NT dollar)

BILL_AMT4: Amount of bill statement in June, 2005 (NT dollar)

BILL_AMT5: Amount of bill statement in May, 2005 (NT dollar)

BILL_AMT6: Amount of bill statement in April, 2005 (NT dollar)

PAY_AMT1: Amount of previous payment in September, 2005 (NT dollar)

PAY_AMT2: Amount of previous payment in August, 2005 (NT dollar)

PAY_AMT3: Amount of previous payment in July, 2005 (NT dollar)

PAY_AMT4: Amount of previous payment in June, 2005 (NT dollar)

PAY_AMT5: Amount of previous payment in May, 2005 (NT dollar)

PAY_AMT6: Amount of previous payment in April, 2005 (NT dollar)

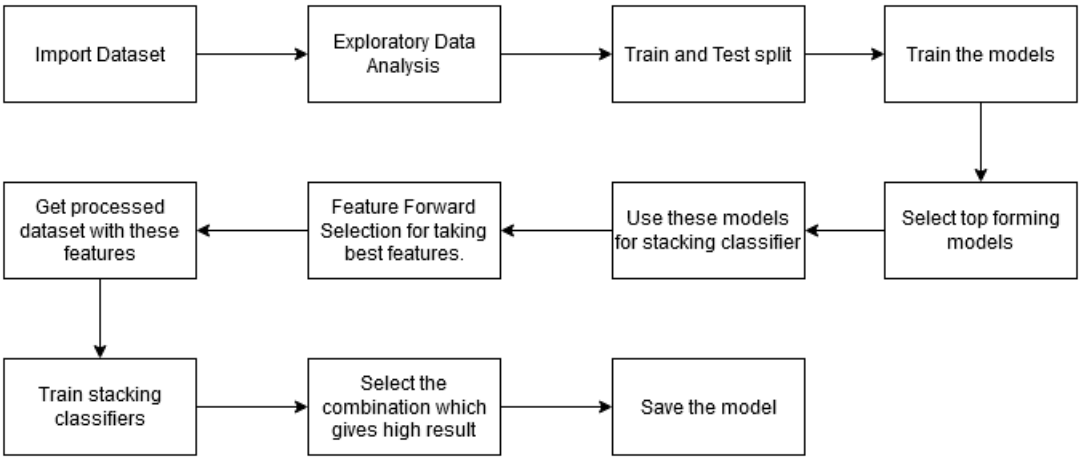
default.payment.next.month: Default payment (1=yes, 0=no)

2.4 TOOLS USED

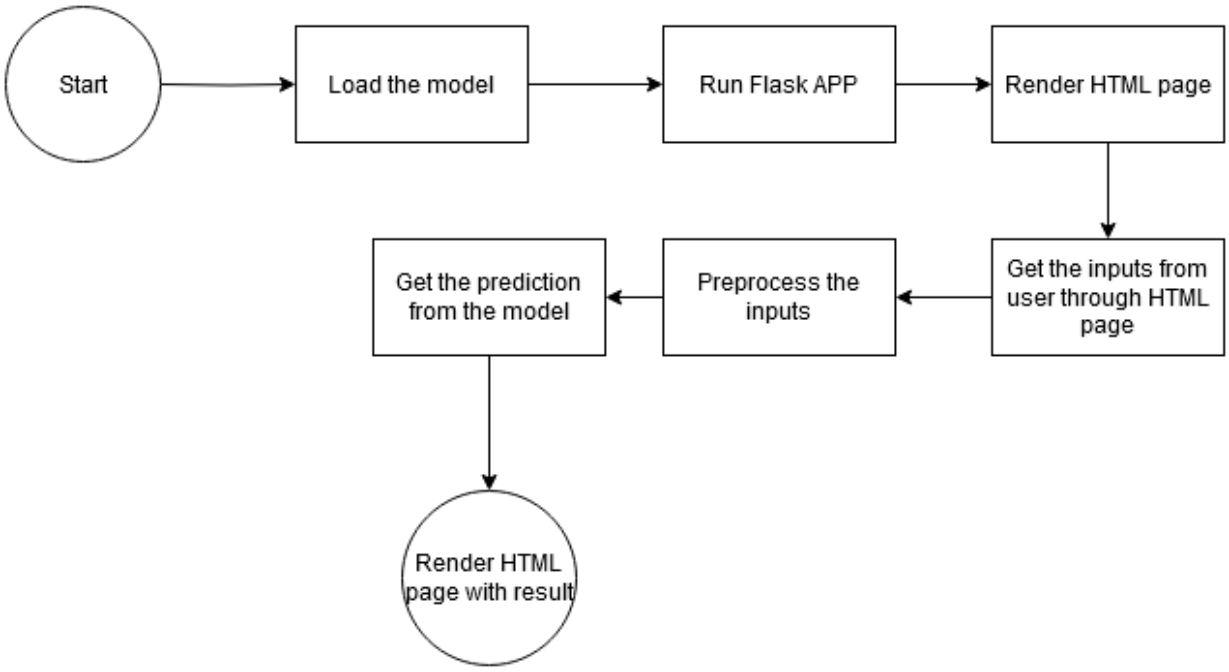
Python programming language and frameworks such as Numpy, Pandas, Scikit-learn, Matplotlib, and Seaborn are used to build the whole model. Flask is used to deploy trained model.

3.DESIGN DETAILS

Process flow



Deployment process



4.CONCLUSION

The model is deployed using Flask and designed UI which helps to user to interact with the model by providing necessary details. The above designing process will help banks and loan lenders predict whether customers will default the credit card payment or not, so the bank or respective departments can take necessary action, basedon the model's predictions.