Predicting credit card approval machine learning

INTRODUCTION

1.1 Overview

An overview of credit card prediction is a broad summary of the process of using data and machine learning algorithms to make predictions about the behavior of credit card users. The goal of credit card prediction is to help financial institutions and credit card companies better understand and manage risk, as well as to detect and prevent fraud.

To achieve this goal, credit card prediction models are trained on large and diverse datasets that contain information such as demographic information, past transactions, credit history, and behavioral patterns. By analyzing this data, the models can make predictions about a variety of outcomes, such as the likelihood of a user missing a payment, making a large purchase, or committing fraud.

The models used for credit card prediction can include a range of techniques, including decision trees, random forests, and neural networks. These techniques allow the models to learn complex patterns and relationships in the data, and make accurate predictions based on this understanding.

In conclusion, credit card prediction is a valuable tool for improving financial decision-making and reducing risk, and can be used by financial institutions, lenders, and credit card companies to better understand and manage their portfolios.

1.2 Purpose

The purpose of credit card prediction is to help financial institutions, lenders, and credit card companies make informed decisions and better manage risk. By using data analysis and machine learning algorithms, credit card prediction models can make predictions about the behavior of credit card users and help identify potential issues before they become major problems.

Here are a few specific purposes of credit card prediction:

1. Default Risk Assessment: By analyzing the past behavior of credit card users, credit card prediction models can predict the likelihood of a user missing a payment or defaulting on their debt. This information can be used by lenders to assess the risk associated with issuing a loan or credit card.

2. Fraud Detection: Credit card prediction models can help identify patterns of behavior that are indicative of fraud. This can include identifying unusual spending patterns, detecting fake or stolen identities, or identifying anomalies in payment patterns.
3. Spending Patterns: Credit card prediction models can also be used to predict future spending patterns of credit card users. This information can be used by financial institutions and credit card companies to better understand consumer behavior and make more informed business decisions.
4. Customer Segmentation: Credit card prediction models can be used to segment customers based on their behavior and demographics. This information can be used to target marketing campaigns and offer customized products and services to customers.

Overall, the purpose of credit card prediction is to improve financial decision-making, reduce risk, and create a better understanding of consumer behavior.

2.LITERATURE SURVEY

2.1 Existing Problem

The existing system for credit card prediction typically involves the use of machine learning algorithms and data analysis. Financial institutions, lenders, and credit card companies collect data on credit card users, including demographic information, past transactions, and credit history. This data is then used to train machine learning models that can make predictions about future behavior.

Some of the most commonly used machine learning algorithms for credit card prediction include decision trees, random forests, and neural networks. These algorithms can learn complex patterns and relationships in the data, and make predictions based on this understanding.

In the existing system, credit card prediction models are typically updated regularly to incorporate new data and improve the accuracy of the predictions. The models may also be fine-tuned to better reflect the specific needs and

2.2 Proposed Solution

A proposed system for credit card prediction would likely involve the integration of advanced machine learning techniques and the use of even more diverse and comprehensive data sets.

One potential advancement could be the integration of alternative data sources, such as social media and e-commerce data, to get a more complete picture of a customer's behavior and financial situation. This could provide a more nuanced and accurate prediction of a customer's credit risk.

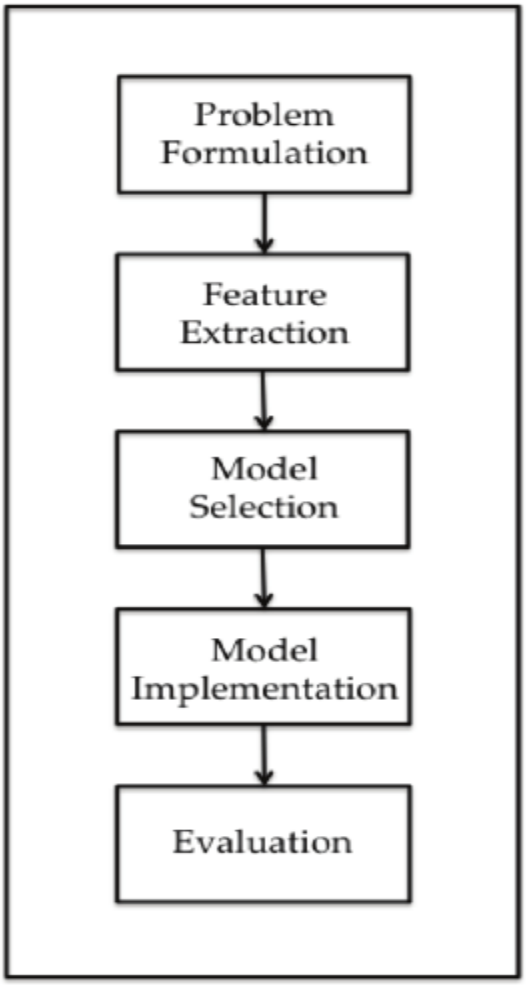
Another area of improvement could be the use of deep learning techniques, such as recurrent neural networks (RNNs) and long short-term memory (LSTM) networks, which have shown promising results in fields such as natural language processing and speech recognition. These techniques could help credit card prediction models better understand and identify complex patterns in the data.

Additionally, the proposed system could involve the integration of blockchain technology to enhance security and reduce the risk of fraud. This would allow for secure and transparent transactions and help prevent unauthorized access to sensitive information.

In conclusion, a proposed system for credit card prediction would likely involve the integration of advanced machine learning techniques and a wider range of data sources, as well as the use of blockchain technology to enhance security and accuracy. These advancements could lead to even more accurate predictions and help financial institutions and credit card companies better understand and manage risk.

3. THEORETICAL ANALYSIS

3.1 Block Diagram:



3.2 Hardware/Software Designing

1.Software Requirements

1.Downloading of Anaconda Navigator

2.Downloading of python packages like

a. NumPy Package

b. Pandas

c. librosa

d. Tensor Flow

e. Matplotlib

f. scikit-learn

g. Flask

h. import sklearn.model_selection

i.from sklearn.model_selection import train_test_split

j. import scipy.io.wavfile as wav

k. import os

l. import pickle

m. import operator

These are some of the software requirements required to implement the music genre classification project using KNN algorithm.

4.EXPERIMENTAL INVESTIGATION

An experimental investigation in the field of credit card prediction typically involves conducting a study to evaluate the performance of a particular machine learning algorithm or to compare the performance of different algorithms.

In such a study, the research team would first collect a dataset of credit card transactions and demographic information. This data would then be pre-processed and transformed into features suitable for use in a machine learning model.

Next, the researchers would train one or more machine learning algorithms on the dataset, using techniques such as cross-validation to prevent overfitting and to ensure that the model is generalizable to new data.

Once the model has been trained, the researchers would evaluate its performance using metrics such as accuracy, precision, recall, and F1 score. They may also compare the performance of different algorithms to determine which is the most effective for a given task.

Finally, the results of the study would be reported and analyzed, and any areas for improvement would be identified. These findings could be used to inform future research and development in the field of credit card prediction.

Overall, an experimental investigation in the field of credit card prediction is a crucial step in advancing our understanding of how to make accurate predictions about credit card usage and behavior.

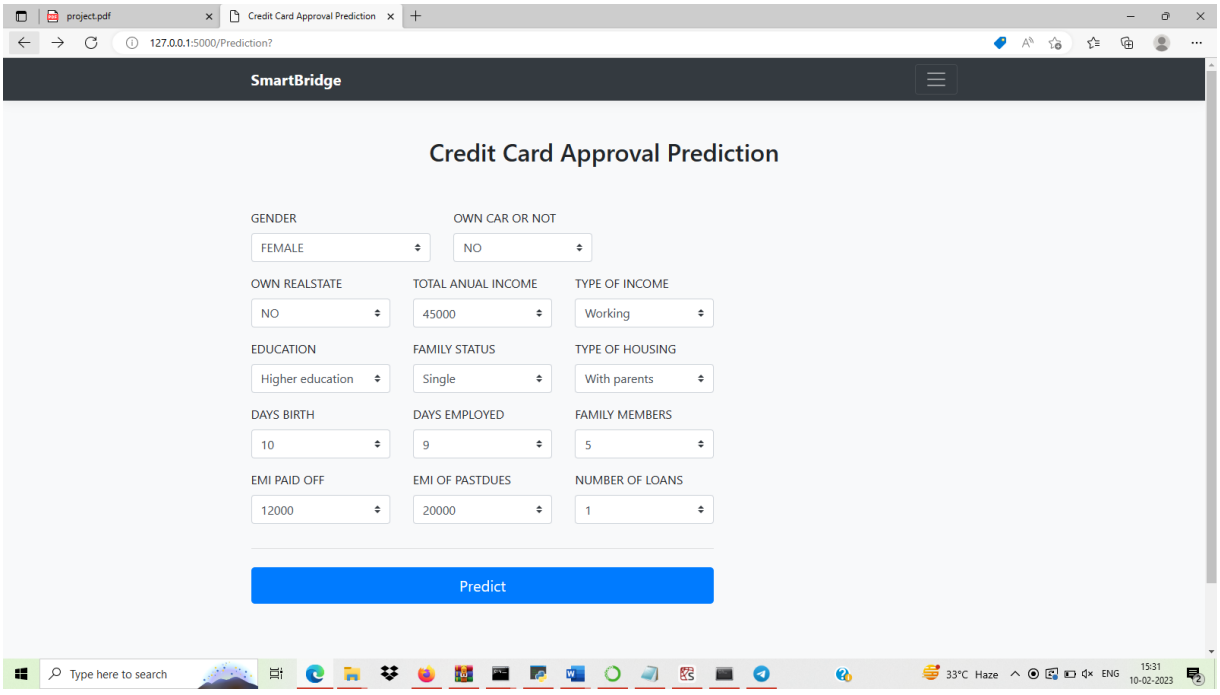
5.RESULT

The results of an experimental investigation in the field of credit card prediction would depend on the specific study design and the algorithms and techniques used. However, some possible outcomes include:

1. Improved accuracy: The results of a credit card prediction study could demonstrate that a particular machine learning algorithm or technique is able to achieve higher accuracy than previous methods, providing more reliable and accurate predictions about credit card usage and behavior.
2. Comparison of algorithms: The study may compare the performance of different machine learning algorithms, such as decision trees, random forests, and neural networks, and determine which is the most effective for a given task.
3. Identification of important features: The results of a study may highlight which features or variables are the most important in determining credit card behavior, helping financial institutions and credit card companies to better understand their customers.
4. Improved understanding of customer behavior: By making accurate predictions about credit card usage and behavior, a credit card prediction system can provide valuable insights into the behavior and spending patterns of customers.
5. Better risk management: Accurate predictions about credit card usage and behavior can help financial institutions and credit card companies to better manage risk, making informed decisions about credit card applications and transactions.

Overall, the results of a credit card prediction study could have significant implications for the financial industry and could help to improve the accuracy and reliability of credit card predictions.

Fig:1 output


project.pdf
Credit Card Approval Prediction
127.0.0.1:5000/Prediction?
SmartBridge
Credit Card Approval Prediction
GENDER
FEMALE
OWN CAR OR NOT
NO
OWN REALSTATE
NO
TOTAL ANUAL INCOME
45000
TYPE OF INCOME
Working
EDUCATION
Higher education
FAMILY STATUS
Single
TYPE OF HOUSING
With parents
DAYS BIRTH
10
DAYS EMPLOYED
9
FAMILY MEMBERS
5
EMI PAID OFF
12000
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NUMBER OF LOANS
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Predict
Type here to search
33°C Haze
ENG
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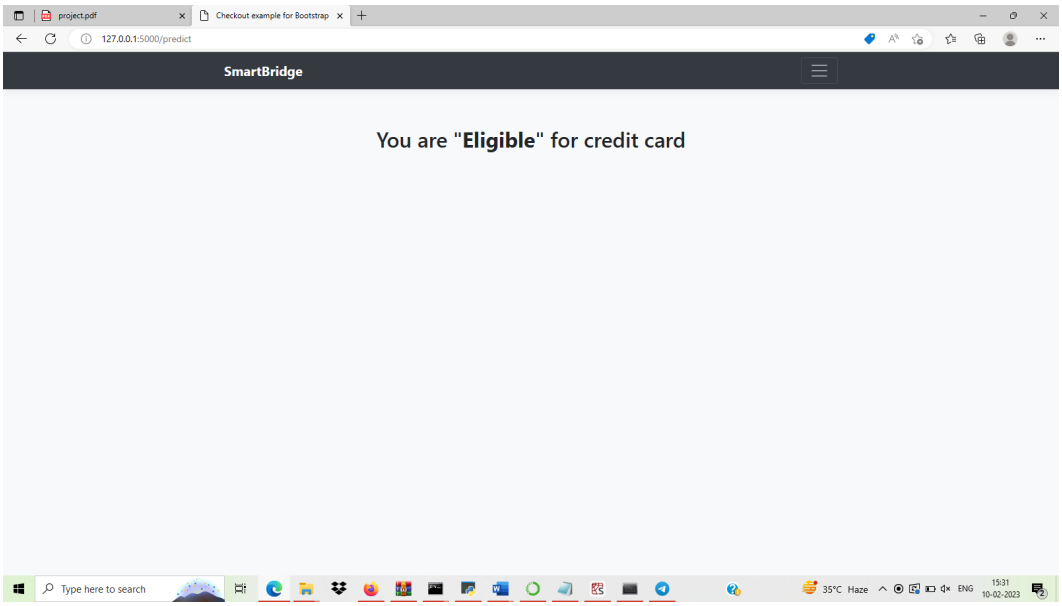
10-02-2023

Fig 2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Checkout example for Bootstrap
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SmartBridge
You are "Eligible" for credit card
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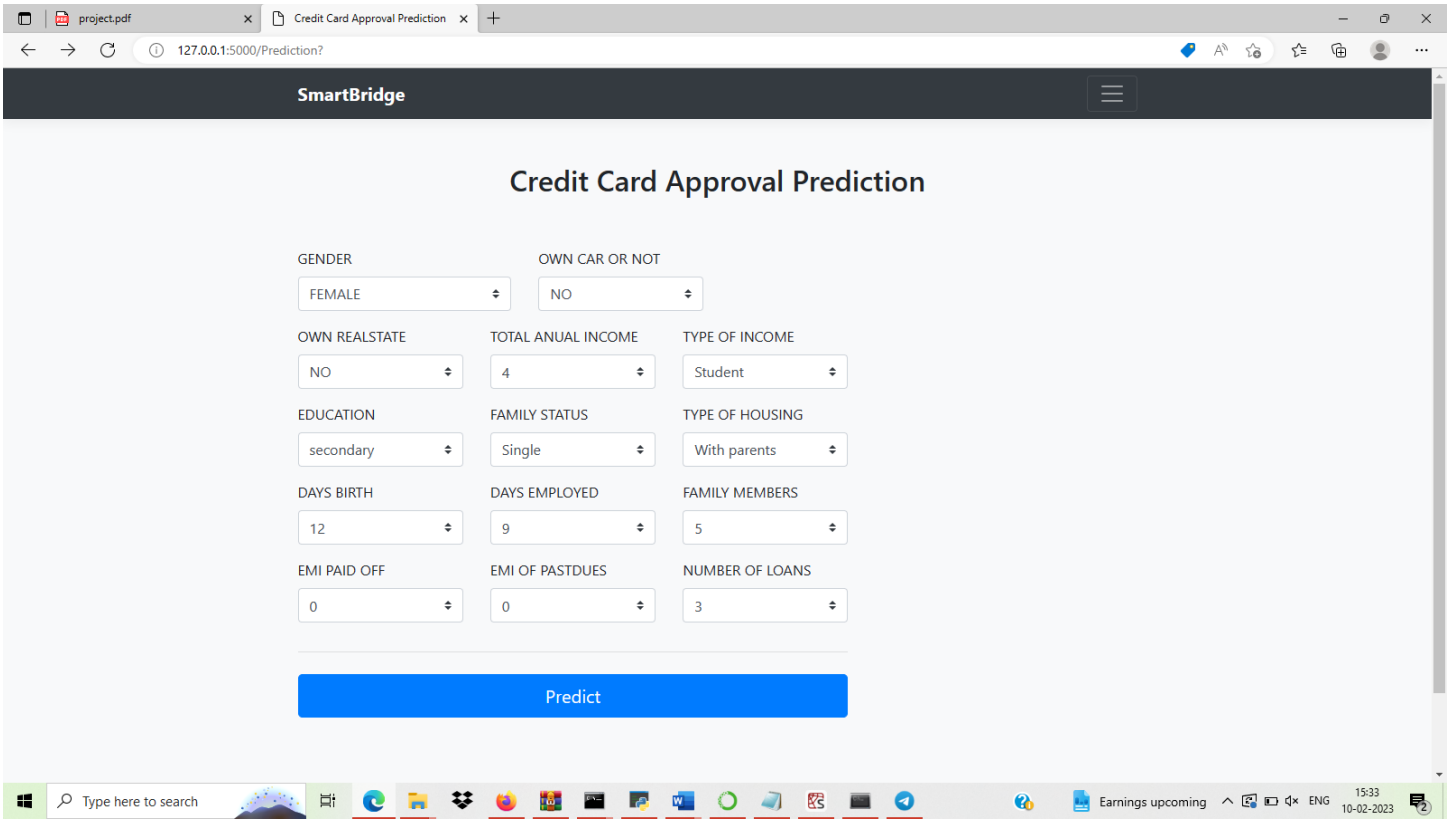
Fig 3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GENDER
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TOTAL ANUAL INCOME
4
TYPE OF INCOME
Student
EDUCATION
secondary
FAMILY STATUS
Single
TYPE OF HOUSING
With parents
DAYS BIRTH
12
DAYS EMPLOYED
9
FAMILY MEMBERS
5
EMI PAID OFF
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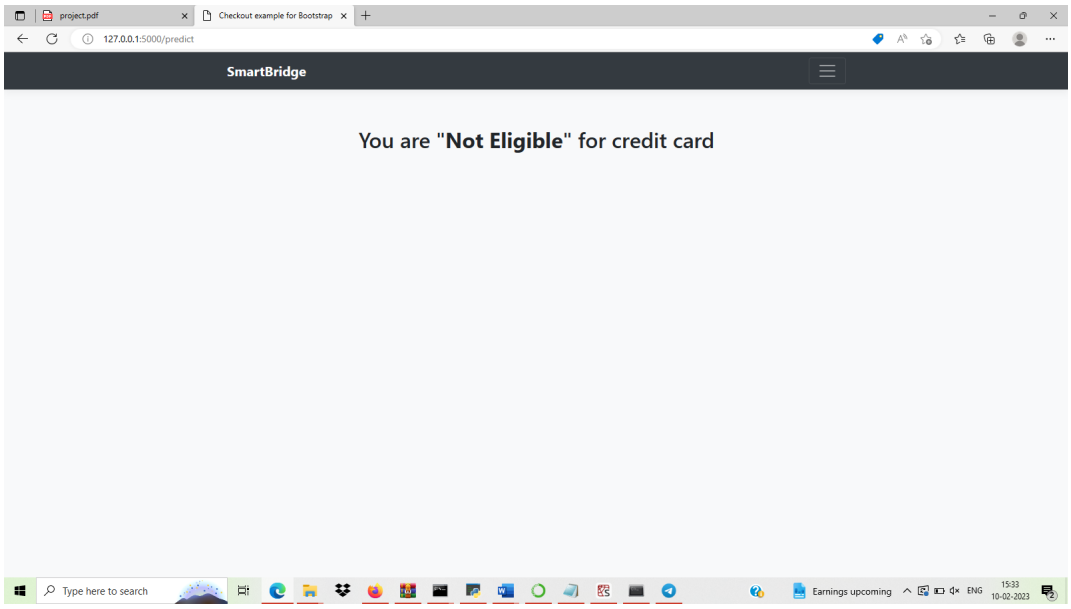
Fig 4:



7.ADVANTAGES AND DISADVANTAGES

ADVANTAGES

There are several advantages of using a credit card prediction system:

1. Improved decision-making: By providing accurate predictions about credit card usage and behavior, a credit card prediction system can help financial institutions and credit card companies to make more informed decisions about credit card applications, transactions, and risk management.
2. Better risk management: Accurate predictions about credit card behavior can help financial institutions and credit card companies to identify and manage potential risks associated with credit card use, such as fraud and default.
3. Increased efficiency: By automating the process of predicting credit card behavior, a credit card prediction system can reduce the amount of time and resources required to make informed decisions, leading to increased efficiency and cost savings.

DISADVANTAGES

While a credit card prediction system offers many benefits, there are also some potential disadvantages to consider:

1. Privacy concerns: The collection and analysis of credit card data can raise privacy concerns, particularly if the data is used for purposes beyond the original intent of the customer. Financial institutions and credit card companies must take care to ensure that they are using customer data in a responsible and ethical manner.
2. Model limitations: Credit card prediction systems rely on machine learning algorithms that can have limitations, such as overfitting, bias, and a lack of interpretability. As a result, the predictions produced by a credit card prediction system may not always be accurate, and there is a risk of making incorrect decisions based on the output of the system.
3. Need for large datasets: To be effective, credit card prediction systems require large datasets of credit card transactions and demographic information. Financial institutions and credit card companies may need to invest significant time and resources into collecting and processing this data.

8.APPLICATIONS

Credit card fraud detection: Credit card prediction systems can be used to identify and detect instances of fraud by analyzing patterns of credit card use and behavior.

1. Customer credit scoring: Credit card prediction systems can be used to analyze credit card transactions and demographic data to predict the creditworthiness of customers and determine the likelihood of default.
2. Customer segmentation: Credit card prediction systems can be used to segment customers based on their credit card usage and behavior, providing valuable insights for targeted

marketing campaigns and product development.
3. Personalized offers: Credit card prediction systems can be used to make personalized offers to customers based on their predicted spending habits, improving customer engagement and loyalty.

9.CONCLUSION

In conclusion, credit card prediction systems are an important tool for financial institutions and credit card companies to better understand and manage customer behavior and risk. By analyzing credit card transactions and demographic data, these systems can provide valuable insights into customer spending habits, creditworthiness, and the likelihood of fraud.

However, it is important to consider the potential disadvantages of credit card prediction systems, such as privacy concerns, model limitations, and the need for large datasets, to ensure that they are used in a responsible and ethical manner. With the right approach, credit card prediction systems have the potential to provide significant benefits and support informed decision-making in the financial industry.

10. FUTURE SCOPE

The future of credit card prediction systems is bright, and there are several areas in which they are likely to evolve and improve in the coming years:

1. Improved accuracy: Advances in machine learning and artificial intelligence are likely to lead to more accurate predictions and better performance from credit card prediction systems.
2. Increased automation: Credit card prediction systems are likely to become increasingly automated, reducing the need for manual intervention and improving efficiency.
3. Integration with other systems: Credit card prediction systems are likely to be integrated with other financial systems, such as banking and payment systems, to provide a more comprehensive view of customer behavior and credit risk.
4. Better privacy protection: As privacy concerns continue to be a top priority for consumers, credit card prediction systems are likely to adopt stronger privacy protections, such as encrypted data storage and advanced data anonymization techniques.

11.BIBLIOGRAPHY

1.https://github.com/smartinternz02/SI-GuidedProject-431204-1674104049.git

2https://www.kaggle.com/code/namphuengauawatcharo/credit-card-approval-prediction/data

APPENDIX:

Source code: # importing the necessary dependencies

```
from flask import Flask,request,render_template
import numpy as np
import pandas as pd
import pickle
import os
# initializing a flask app
#filepath="I:\SmartBridge Projects\Co2 emission\co2.pickle"
#model=pickle.load(open(co2.pickle,'rb'))

#with open('C://Users/HP/Desktop/Prndrive/Loan Aproval Prediction - Docx Left/Flask/c_card_aproval_pred.pickle' 'rb') as handle:
model = pickle.load(open("c_card_aproval_pred.pickle","rb"))
app= Flask(__name__)
@app.route('/')# route to display the home page
def home():
        return render_template('index.html') #rendering the home page
@app.route('/Prediction',methods=['POST','GET'])
def prediction(): # route which will take you to the prediction page
```

```
        return render_template('index1.html')
@app.route('/Home',methods=['POST','GET'])
def my_home():
        return render_template('index.html')


@app.route('/predict',methods=["POST","GET"])# route to show the predictions in a web UI
def predict():
        #  reading the inputs given by the user
        input_feature=[float(x) for x in request.form.values() ]
        features_values=[np.array(input_feature)]

feature_name=['CODE_GENDER','FLAG_OWN_CAR','FLAG_OWN_REALTY','AMT_INCOME_TOTAL','NAME_INCOME_TYPE','NAME_EDUCATION_TYPE','NAME_FAMILY_STATUS','NAME_HOUSING_TYPE','DAYS_BIRTH','DAYS_EMPLOYED','CNT_FAM_MEMBERS','paid_off','#_of_pastdues','no_loan']
        x=pd.DataFrame(features_values,columns=feature_name)


        # predictions using the loaded model file
        pred=model.predict(x)
        print(pred)
        if pred==0:
        prediction = "Eligible"
        else:
        prediction = "Not Eligible"



        #prediction="Prediction is:"+str(predic)


        # showing the prediction results in a UI
```

```
        return render_template("result.html",prediction=prediction)
if __name__=="__main__":

        # app.run(host='0.0.0.0', port=8000,debug=True)     # running the app
  #  port=int(os.environ.get('PORT',5000))
        app.run(debug=True)
```