Project Report

Smart Lender - Applicant Credibility Prediction for Loan Approval

1.INTRODUCTION:

1.1 PROJECT OVERVIEW:

The most valuable component of any economy is its banks. When assessing a country's progress, factors like banks, interest rates, and borrowings should be taken into account. Payment of cash obtained back from borrowers makes up a significant portion of supporting credit distribution activities in addition to raising resources through new deposits, borrowings, etc.

Bank management aims to keep the losses at low level. By using machine learning algorithms, loan approval process can be done easily. This is a categorization issue where we must classify whether or not the loan will be accepted. In a problem in predictive modelling known as classification, a class label is predicted for a specific example of input data. Using the information supplied by the borrower, an entity is expected to automate the loan qualification process. The loan amount, the borrower's name, marital status, income, credit history, level of education, the number of dependents, and a few other details are required when submitting a request form.

1.2 PURPOSE:

Project Objective: To automate the loan eligibility process real-time based on customer detail provided while filling out online application forms. These details are Gender, Marital Status, Education, number of Dependents, Income, Loan Amount, Credit History, and others. They have provided a dataset to identify the customer segments that are eligible for loan amounts so that they can specifically target these customers.

Technical aspects that we would get if we complete this project:

1. Knowledge of Machine Learning Algorithms.

2. Knowledge of Python Language with Machine Learning.

3. Understand about Classification and regression problem.

4. Know about pre-processing/clean the data using different data pre-processing techniques.

5. Applying different algorithms according to the dataset and based on visualization.

6. Real-Time Analysis of Project.

7. Building ease of User Interface (UI).

8. Navigation of ideas towards other projects(creativeness).

9. Knowledge of building ML model. 10.Build web applications using the Flask framework.

2.LITERATURE SURVEY

2.1 EXIXTING PROBLEM:

Loans are no longer considered a last resort to buy a sought-after smartphone or a dream house. Over the last decade or so, people have become less hesitant in applying for a loan, whether it’s personal, vehicle, education, business, or home – especially when they don’t have a lump sum at their disposal. Besides, Home and Education Loans provide tax advantages that reduce tax liability and increase the cash in hand from salary income.

It also helps that banks are making it easier for customers and prospective borrowers to get loans with minimal paperwork, quick eligibility checks, and competitive interest rates. They have opened an online channel to apply and submit documents for the approval process

However, the viability of this loan cycle may be harmed if the banks are unable to recover the lent sum. The majority of a bank's revenue comes from the amount of interest it charges on loans and if banks are unable to collect these sums, it has an impact on not only their profitability but also their everyday functioning.

2.2 REFERENCES:

1. Sheikh, M. A., Goel, A. K., & Kumar, T. (2020). An Approach for Prediction of Loan Approval using Machine Learning Algorithm. 2020 International Conference on Electronics and Sustainable Communication Systems (ICESC).

2. Pidikiti Supriya, Myneedi Pavani, Nagarapu Saisushma,Namburi Vimala Kumari, k Vikash,“Loan Prediction by using Machine Learning Models”, International Journal of Engineering and Techniques.Volume 5 Issue 2, Mar-Apr 2019

3. Nikhil Madane, Siddharth Nanda,”Loan Prediction using Decision tree”, Journal of the Gujrat Research History, Volume 21 Issue 14s, December 2019.

4. Amruta S. Aphale and R. Prof. Dr. Sandeep. R Shinde, “Predict Loan Approval in Banking System Machine Learning Approach for Cooperative Banks Loan Approval”, International Journal of Engineering Trends and Applications (IJETA), vol. 9, issue 8, 2020).

2.3 PROBLEM STATEMENT DEFINITION:

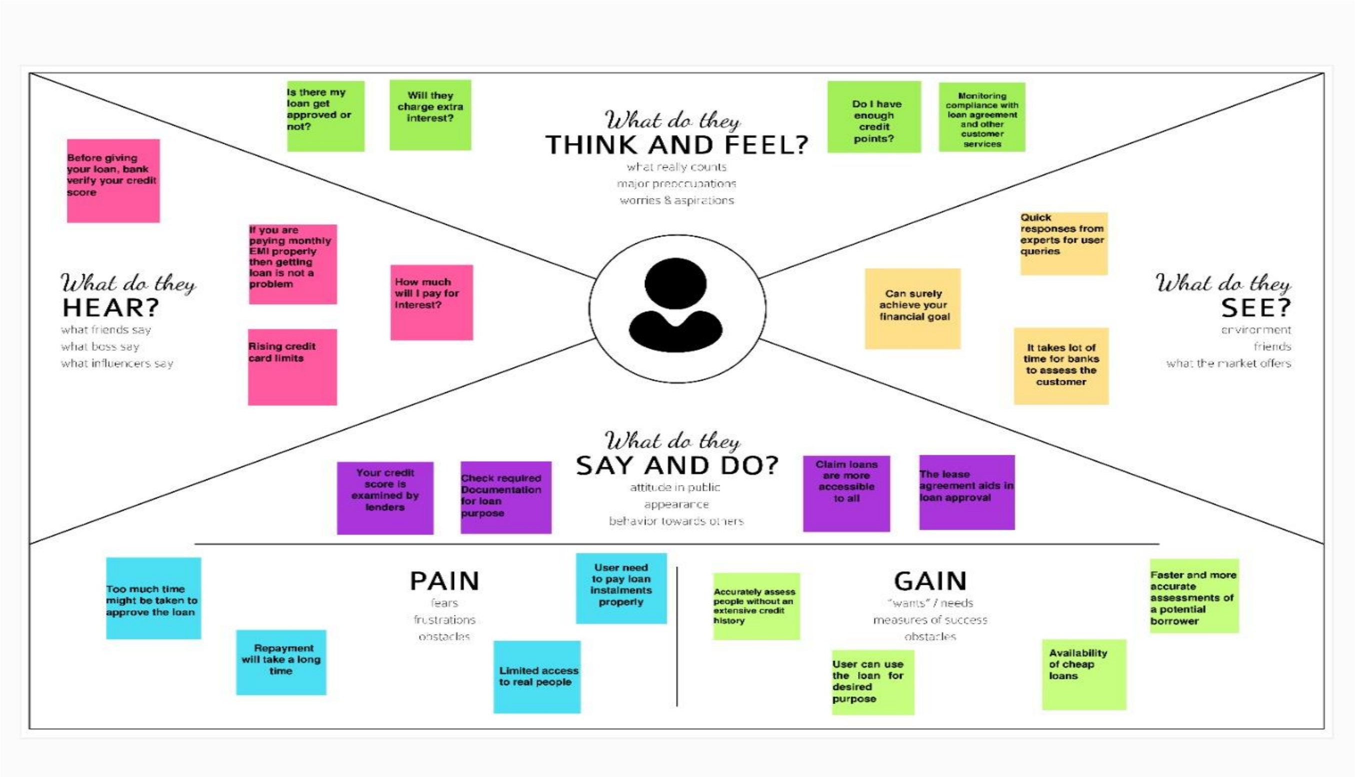
Modernized loan prediction system is based on Machine Learning approach where we can find out whether the loan will pass or not. This system requires data from the users like loan duration, monthly income, loan amount, monthly income etc. According to the parameters provided, the bank decides whether the customer gets the loan or not.

Thus, a classification system exists. In this system, a training set is used to create the model and the classifier will be able to categorise the data items into respective classes. In order to train the data and provide the correct outcome, which is the client's potential and ability to repay the loan, a test dataset is constructed. For banks and customers alike, the prediction of a modernised loan approval system is quite helpful. This method evaluates each candidate based on their priority. The customer can submit their application directly to the bank, in which case the bank will handle the entire procedure without interference from a third party or stockholder. Finally, based on its priority system, the bank will determine if the candidate is deserving or not. The sole goal of this is to ensure that the deserving candidate receives simple and rapid results.

3.IDEATION &PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS:

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes. It is a useful tool to helps teams better understand their users. Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.



What do they THINK AND FEEL?
what really counts
major preoccupations
worries & aspirations
Is there my loan get approved or not?
Will they charge extra interest?
Do I have enough credit points?
Monitoring compliance with loan agreement and other customer services
What do they HEAR?
what friends say
what boss say
what influencers say
Before giving your loan, bank verify your credit score
If you are paying monthly EMI properly then getting loan is not a problem
How much will I pay for Interest?
Rising credit card limits
What do they SEE?
environment
friends
what the market offers
Quick responses from experts for user queries
Can surely achieve your financial goal
It takes lot of time for banks to assess the customer
What do they SAY AND DO?
attitude in public
appearance
behavior towards others
Your credit score is examined by lenders
Check required Documentation for loan purpose
Claim loans are more accessible to all
The lease agreement aids in loan approval
PAIN
fears
frustrations
obstacles
Too much time might be taken to approve the loan
Repayment will take a long time
Limited access to real people
User need to pay loan instalments properly
GAIN
"wants" / needs
measures of success
obstacles
Accurately assess people without an extensive credit history
User can use the loan for desired purpose
Availability of cheap loans
Faster and more accurate assessments of a potential borrower

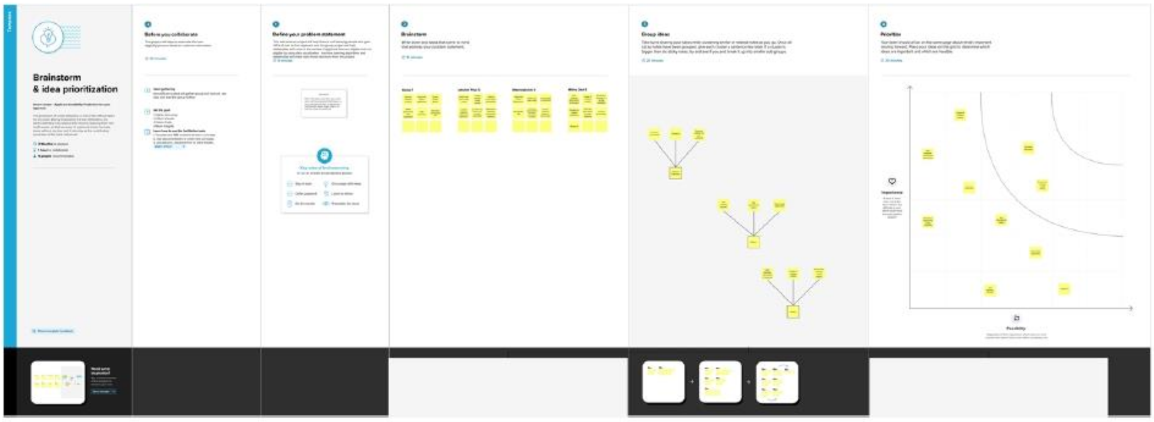
3.2 IDEATION & BRAINSTROMING:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich number of creative solutions. This template shows in our own brainstorming sessions so our team can unleash the imagination and start shaping concepts even if not sitting in the same room.

Step-1: Team Gathering, Collaboration and Select the Problem Statement.

Step-2: Brainstorm, Idea Listing and Grouping

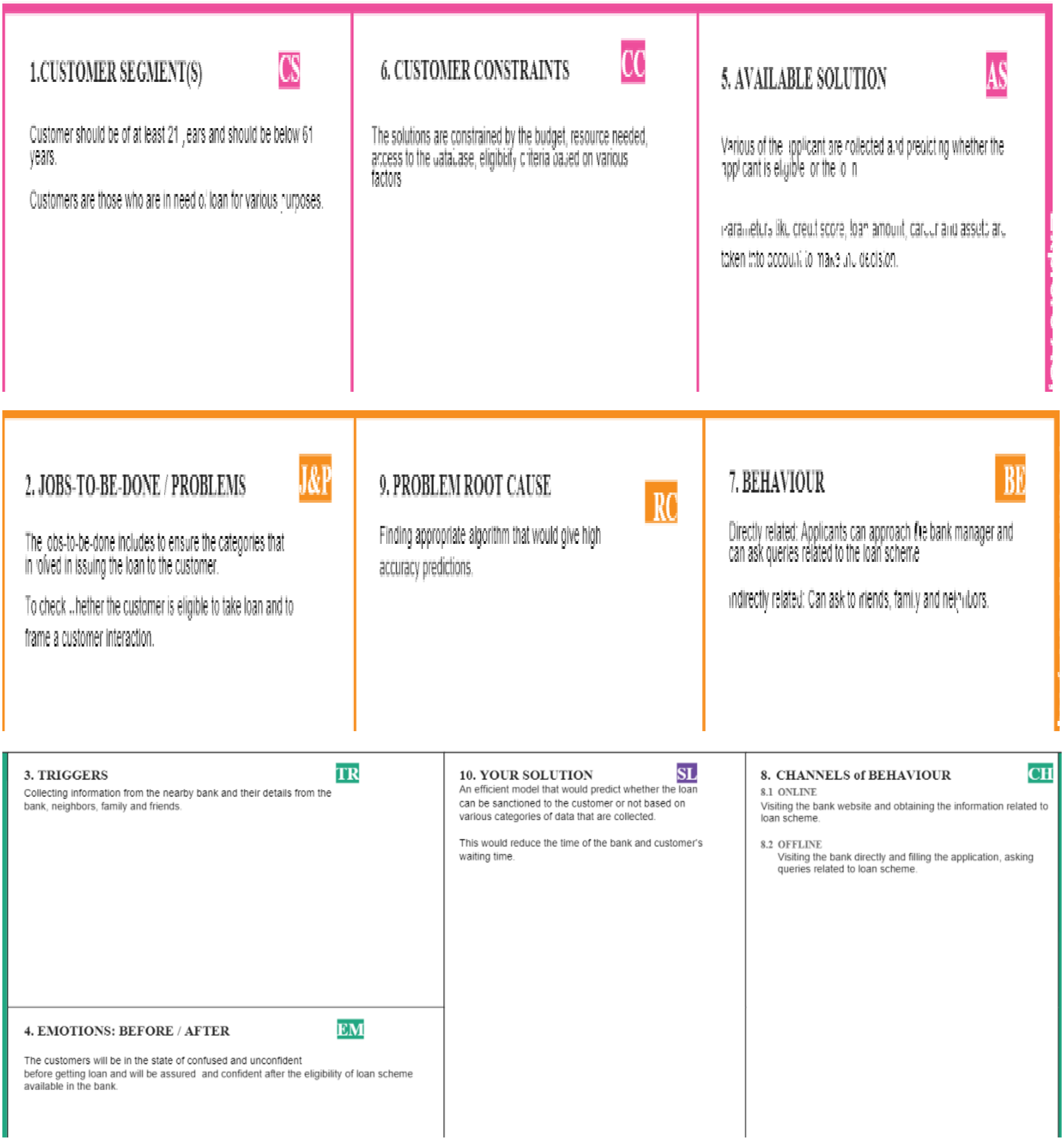
Step-3: Idea Prioritization



3.3 PROPOSED SOLUTION:

S.NO	PARAMETER	DESCRIPTION
1	Problem Statement (Problem to be solved)	The banking and finance professionals who are providing their candidate with a 100% loan will be able to determine whether or not the applicant is suitable for loan approval.
2	Idea / Solution description	In order to anticipate if the consumer is eligible for the loan, we are developing a machine learning model that takes into account a variety of data elements, including credit history, duration time, and credit mix. Both classification and regression tasks perform efficiently using the Decision Tree Algorithm. Loan predictions and their seriousness can be predicted using various analytical approaches
3	Novelty / Uniqueness	The machine learning algorithm makes an accurate estimate of the customer's credit eligibility using a variety of data inputs.
4	Social Impact / Customer Satisfaction	This will lessen all fraud committed at the time of approval, forecast loan approvals, and automate loan approvals.
5	Business Model (Revenue Model)	This model can be created for a reasonable price. It will simultaneously deliver maximum performance, high precision, and the outcome will be more efficient than the conventional procedures.
6	Scalability of the Solution	Software can be modified such that it will receive new testing data, participate in training data, and generate predictions based on that data. Module might be upgraded and made more integrated for future forecasting

3.4 PROBLEM SOLUTION FIT:



1.CUSTOMER SEGMENT(S) CS

Customer should be of at least 21 years and should be below 61 years.

Customers are those who are in need of loan for various purposes.

6. CUSTOMER CONSTRAINTS CC

The solutions are constrained by the budget, resource needed, access to the database, eligibility criteria based on various factors

5. AVAILABLE SOLUTION AS

Various of the applicant are collected and predicting whether the applicant is eligible for the loan

Parameters like credit score, loan amount, career and assets are taken into account to make the decision.

2. JOBS-TO-BE-DONE / PROBLEMS J&P

The jobs-to-be-done includes to ensure the categories that involved in issuing the loan to the customer.

To check whether the customer is eligible to take loan and to frame a customer interaction.

9. PROBLEM ROOT CAUSE RC

Finding appropriate algorithm that would give high accuracy predictions.

7. BEHAVIOUR BE

Directly related: Applicants can approach the bank manager and can ask queries related to the loan scheme

Indirectly related: Can ask to friends, family and neighbors.

3. TRIGGERS TR

Collecting information from the nearby bank and their details from the bank, neighbors, family and friends.

4. EMOTIONS: BEFORE / AFTER EM

The customers will be in the state of confused and unconfident before getting loan and will be assured and confident after the eligibility of loan scheme available in the bank.

10. YOUR SOLUTION SL

An efficient model that would predict whether the loan can be sanctioned to the customer or not based on various categories of data that are collected.

This would reduce the time of the bank and customer's waiting time.

8. CHANNELS of BEHAVIOUR CH

8.1 ONLINE

Visiting the bank website and obtaining the information related to loan scheme.

8.2 OFFLINE

Visiting the bank directly and filling the application, asking queries related to loan scheme.

4.1 REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Enter Mail Id and other personal details required for registration
FR-2	User Confirmation	Confirmation via EmailConfirmation via OTP
FR-3	User Application	Verification of Application Updation of their bank details to check their credentiality
FR-4	User credit score check	Confirms through our proprietary software which evaluates Categorizes users according to credit history
FR-5	User Loan details	Validated by bank or financial institution Credit score and Income Auditing
FR-6	Result	If Approved - Displays the information what to be done next If Declined – Displays not eligible for the loan

4.2 NON-FUNCTIONAL REQUIREMENT:

Following are the non-functional requirements of the proposed solution.

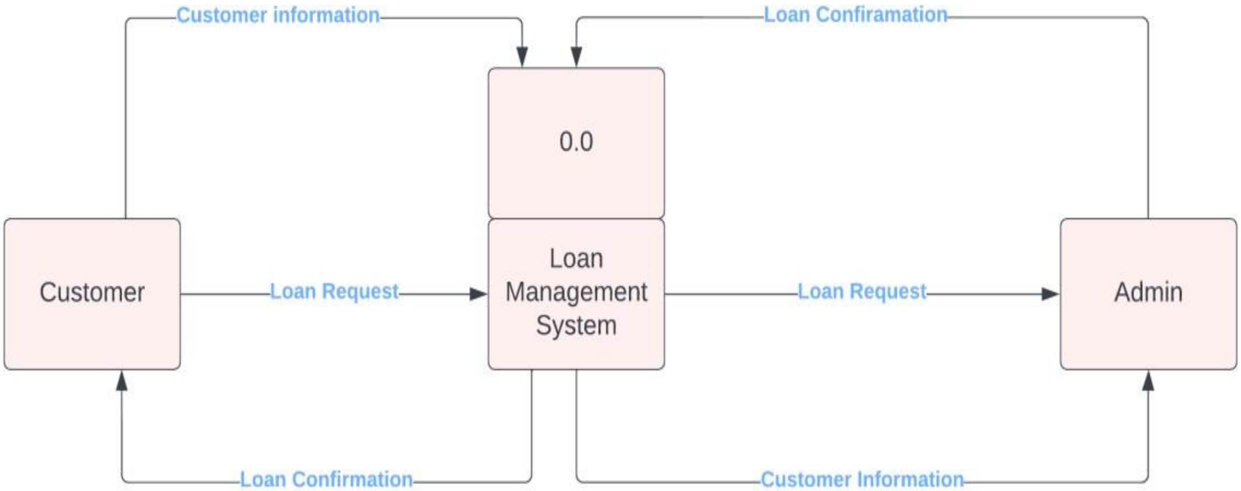
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The application's interface will be organised and tidy, and it will be simple to use. The programme is accessible to users in nearly all web browsers.
NFR-2	**Security**	Customers are asked to create an account using their Email or using One Time Password through their registered mobile number making it more secure and it enhances security features to updatethe documents of users
NFR-3	**Reliability**	Bugs will be detected and fixed as soon as possible making the application even more reliable and trust-worthy
NFR-4	**Performance**	As soon as bugs are found, they will be corrected, making the application even more reliable and trustworthy.
NFR-5	**Availability**	Since it is platform independent, users can accessusing any operating system. Application is accessible round-the-clock due to IBM Cloud hosting
NFR-6	**Scalability**	As the user base expands, cross-platform mobile applications might be created in the future.

5.PROJECT DESIGN

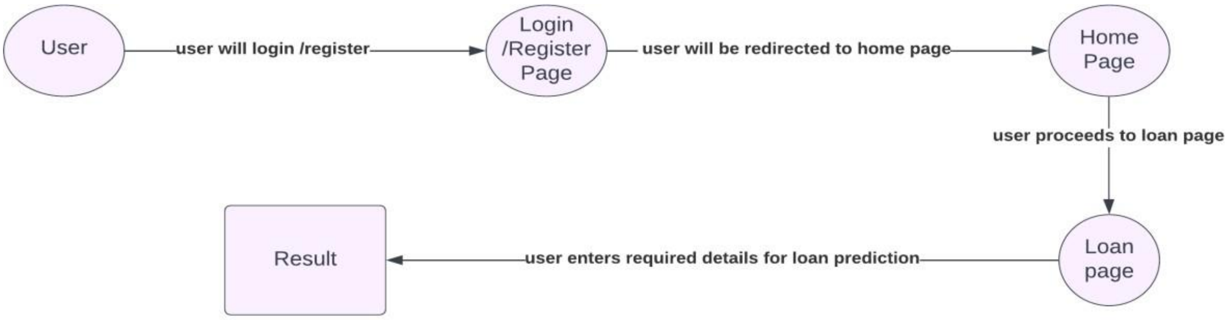
5.1 DATA FLOW DIAGRAMS:

Data Flow Diagrams:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes theinformation, and where data is stored.



DATA FLOW DIAGRAM LEVEL 0


User
user will login /register
Login /Register Page
user will be redirected to home page
Home Page
user proceeds to loan page
Loan page
user enters required details for loan prediction
Result

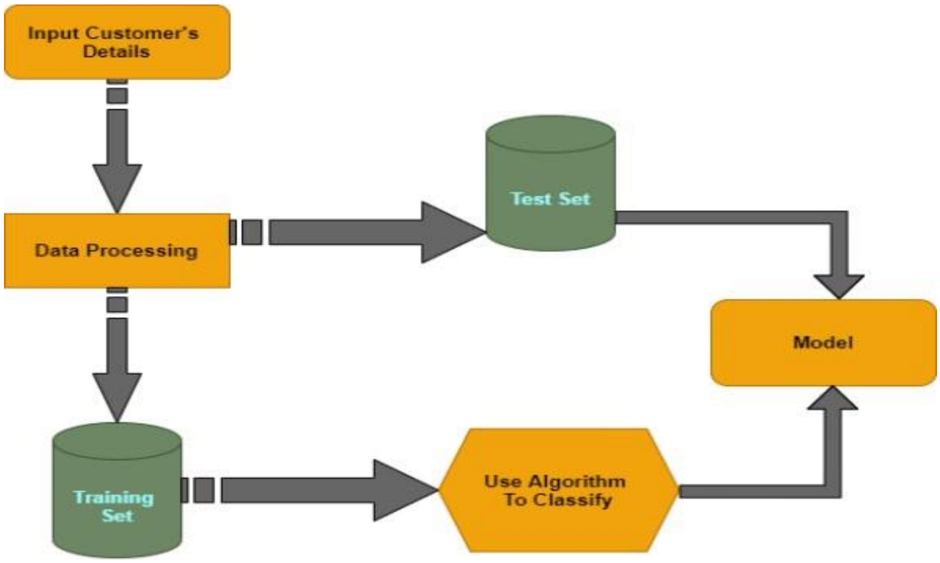
DATA FLOW DIAGRAM LEVEL 1

5.2 SOLUTION AND TECHNICAL ARCHITECTURE:

Solution architecture is a complex process – with many sub-processes – that bridgesthe gap between business problems and technology solutions. Its goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behaviour, and other aspects of thesoftware to project stakeholders.
- Define features, development phases, and solution requirements.
- Provide specifications according to which the solution is defined, managed,and delivered.

Example - Solution Architecture Diagram:



5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail	I can receive confirmation email & check confirm.	Medium	Sprint-1
	Login	USN-5	As a user, I can log intothe application by entering email & password	Able to login	High	Sprint-1
	Dashboard	USN-6	As a user, I should be able to access the dashboard with everything I am allowed to use.	Access the dashboard.	Medium	Sprint-1
Customer (Web user)	Registration	USN-7	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account/dashboard	High	Spring-1
		USN-8	As a user, I will receive confirmation email once I have registered for the application.	I can receive confirmation email& click confirm	High	Spring-1
		USN-9	AS a user, I can register for the application through Facebook.	I can access my account the dashboard with Facebook Login.	Low	Spring-1
		USN-10	As a user, I can register for the application through Gmail.	I can receive confirmation email& click confirm	Medium	Spring-1
	Login	USN-11	As a user, I can log intothe application by entering email & password.	Able to login	High	Sprint-1
	Dashboard	USN-12	As a user, I should be able to access the dashboard with everything I am allowed to use.	Access the Dashboard.	Medium	Sprint-1
Customer Care Executive		USN-13	As a Customer Care Executive, I should be able to solve queries by interacting with users.	Access my account	Medium	Sprint 3

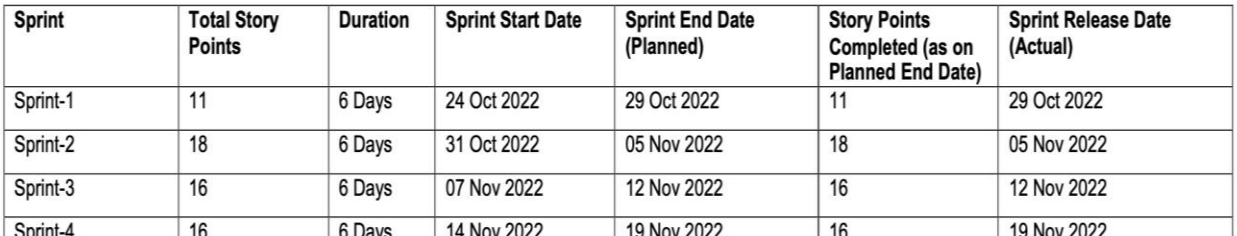
Administrator	Register	USN-14	As an Admin I should be able to register myself with unique Email, Password	Able to Register	Medium	Sprint-4
	Login	USN-14	As an Admin I should be able to login myself with unique Email, Password	Able to Login	Medium	Sprint-4
	Dashboard	USN-15	As an Admin, I should be able to access the dashboard.	Access the dashboard	Medium	Sprint 4

6.PROJECT PLANNING AND SCHEDULING

6.1 SPRINT PLANNING AND ESTIMATION

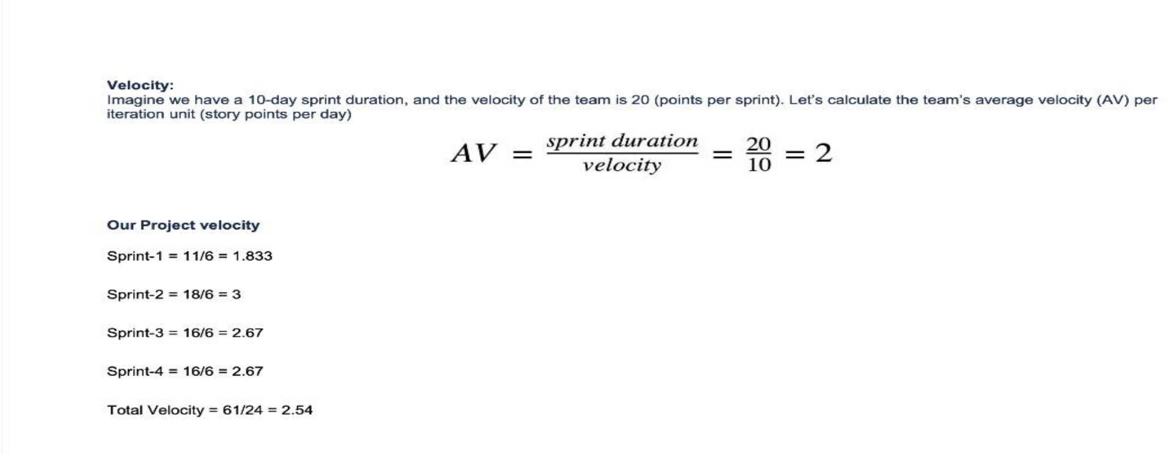
Sprint	Functional requirement (Epic)	Task	Points	Priority	Team Members
Sprint -1	Dataset	Downloading the dataset	1	High	Meenalakshmi S
Sprint -1		Visualizing the dataset	2	Low	Komal T Lekshmipriya S Meenalakshmi S Mithra Devi R
Sprint -1		Pre-processing the dataset	3	Medium	Komal T Lekshmipriya S Meenalakshmi S Mithra Devi R
Sprint -1	Machine learning Model	KNN model building	5	High	Meenalakshmi S Mithra Devi R
Sprint -2		Decision Tree model building	5	High	Komal T Lekshmipriya S
Sprint -2		Xgboost Model Building	5	High	Meenalakshmi S Mithra Devi R
Sprint-		Random Forest model	3	Low	Komal T Lekshmipriya S
Sprint -2		Evaluation and saving of the models	5	High	Lekshmipriya S
Sprint -3	Customer User Interface	Model Integration with Flask	5	High	Meenalakshmi S Mithra Devi R
Sprint -3		Building Html pages Build python code	3	Medium	Komal T Mithra Devi R Meenalakshmi S
Sprint -3		Select the type of loan	3	Low	Meenalakshmi S Lekshmipriya S
Sprint -3		Fill the Application and check the eligibility of the loan approval	5	High	Mithra Devi R Lekshmipriya S
Sprint -4	Deployed the website	Register on IBM Cloud	3	Low	Komal T
Sprint -4		Train the ML model on IBM Cloud	5	Medium	Komal T Lekshmipriya S

6.2SPRINT DELIVERY SCHEDULE



Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	11	6 Days	24 Oct 2022	29 Oct 2022	11	29 Oct 2022
Sprint-2	18	6 Days	31 Oct 2022	05 Nov 2022	18	05 Nov 2022
Sprint-3	16	6 Days	07 Nov 2022	12 Nov 2022	16	12 Nov 2022
Sprint-4	16	6 Days	14 Nov 2022	19 Nov 2022	16	19 Nov 2022

6.3 REPORTS FROM JIRA



Velocity:
Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

Our Project velocity

Sprint-1 = 11/6 = 1.833

Sprint-2 = 18/6 = 3

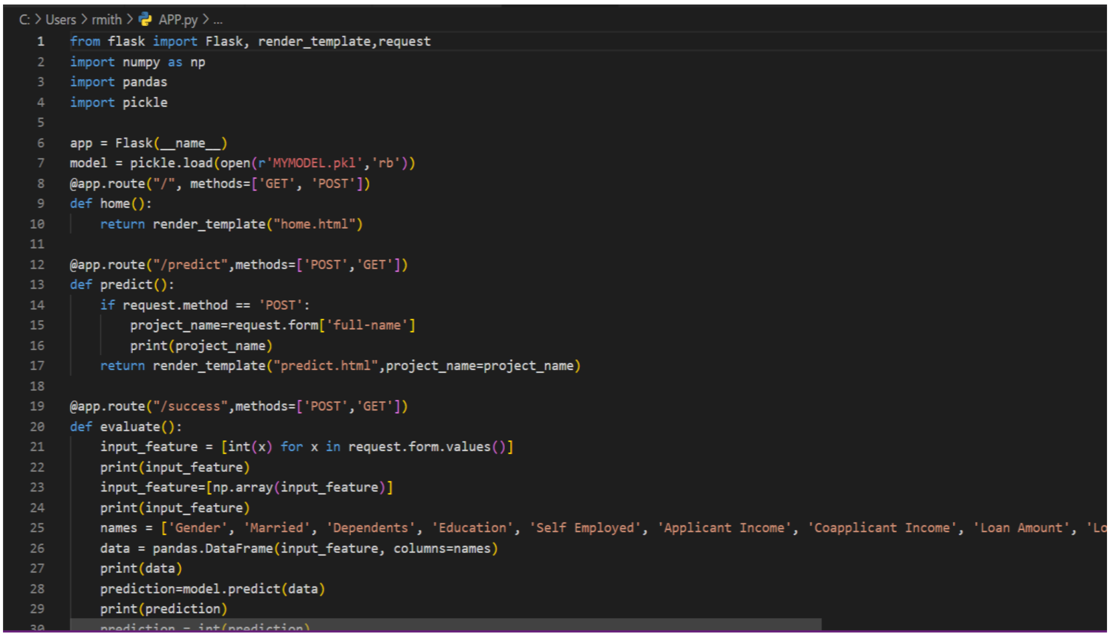
Sprint-3 = 16/6 = 2.67

Sprint-4 = 16/6 = 2.67

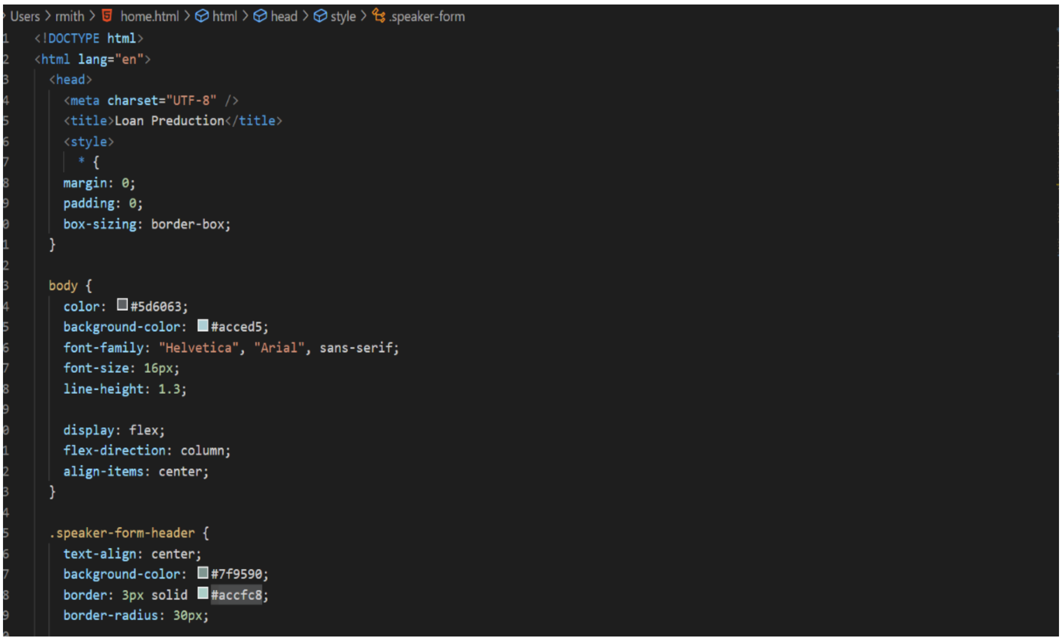
Total Velocity = 61/24 = 2.54

7.CODING &SOLUTION

7.1 FEATURE 1:FORM FILLING

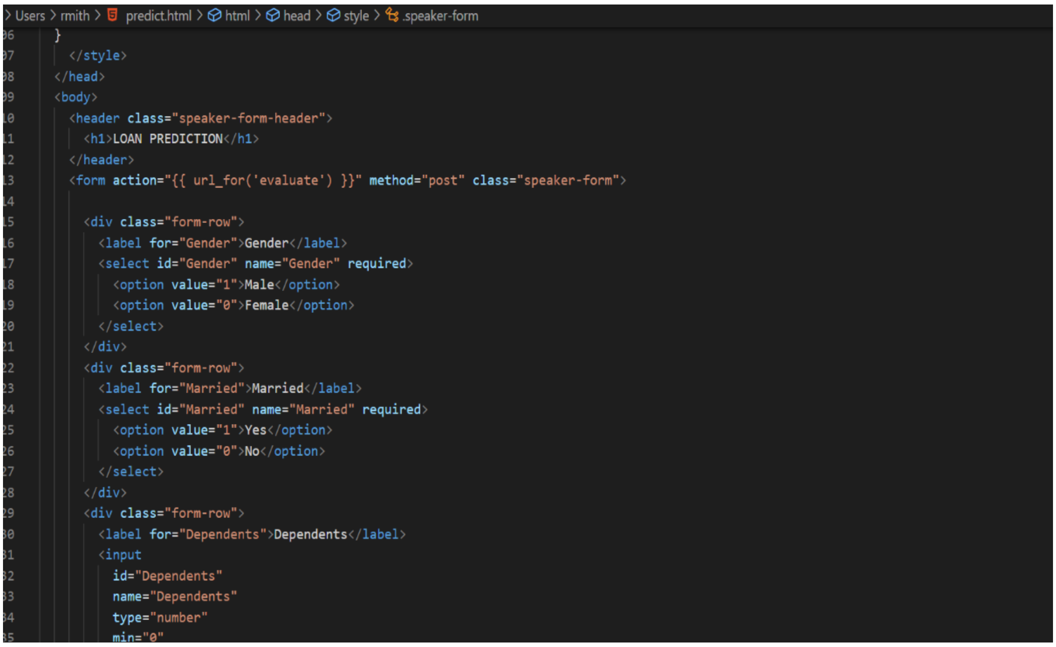


```python
from flask import Flask, render_template,request
import numpy as np
import pandas
import pickle

app = Flask(__name__)
model = pickle.load(open(r'MYMODEL.pkl','rb'))
@app.route("/", methods=['GET', 'POST'])
def home():
    return render_template("home.html")

@app.route("/predict",methods=['POST','GET'])
def predict():
    if request.method == 'POST':
        project_name=request.form['full-name']
        print(project_name)
    return render_template("predict.html",project_name=project_name)

@app.route("/success",methods=['POST','GET'])
def evaluate():
    input_feature = [int(x) for x in request.form.values()]
    print(input_feature)
    input_feature=[np.array(input_feature)]
    print(input_feature)
    names = ['Gender', 'Married', 'Dependents', 'Education', 'Self Employed', 'Applicant Income', 'Coapplicant Income', 'Loan Amount', 'Lo
    data = pandas.DataFrame(input_feature, columns=names)
    print(data)
    prediction=model.predict(data)
    print(prediction)
    prediction = int(prediction)
```



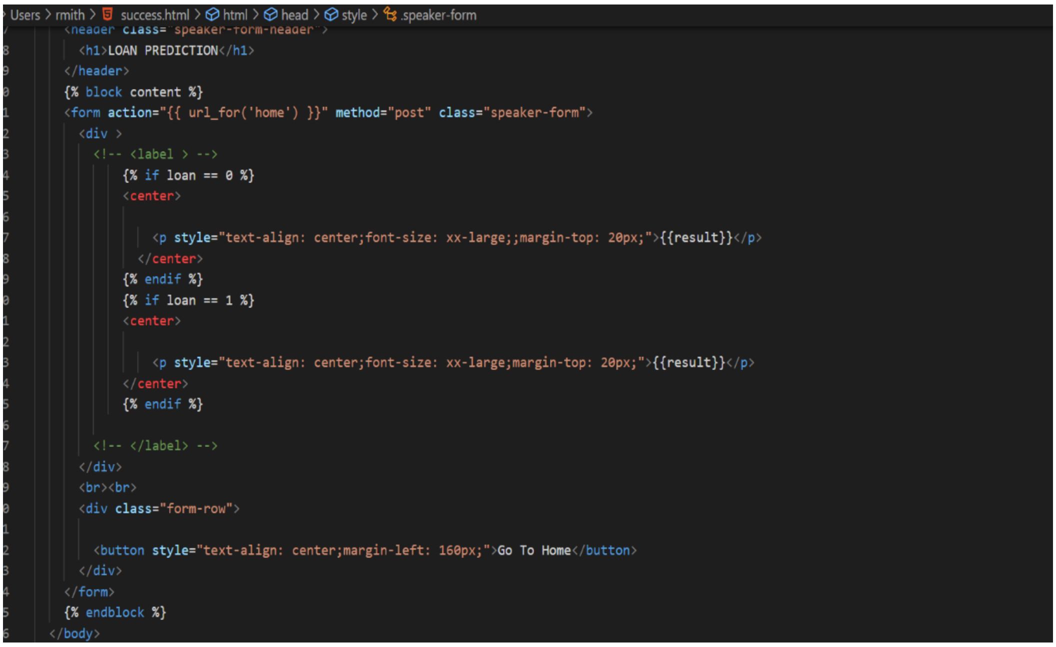
Users > rmith > home.html > html > head > style > .speaker-form

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <title>Loan Preduction</title>
    <style>
      * {
    margin: 0;
    padding: 0;
    box-sizing: border-box;
  }

  body {
    color: #5d6063;
    background-color: #acced5;
    font-family: "Helvetica", "Arial", sans-serif;
    font-size: 16px;
    line-height: 1.3;

    display: flex;
    flex-direction: column;
    align-items: center;
  }

  .speaker-form-header {
    text-align: center;
    background-color: #7f9590;
    border: 3px solid #accfc8;
    border-radius: 30px;
```



Users > rmith > predict.html > html > head > style > .speaker-form

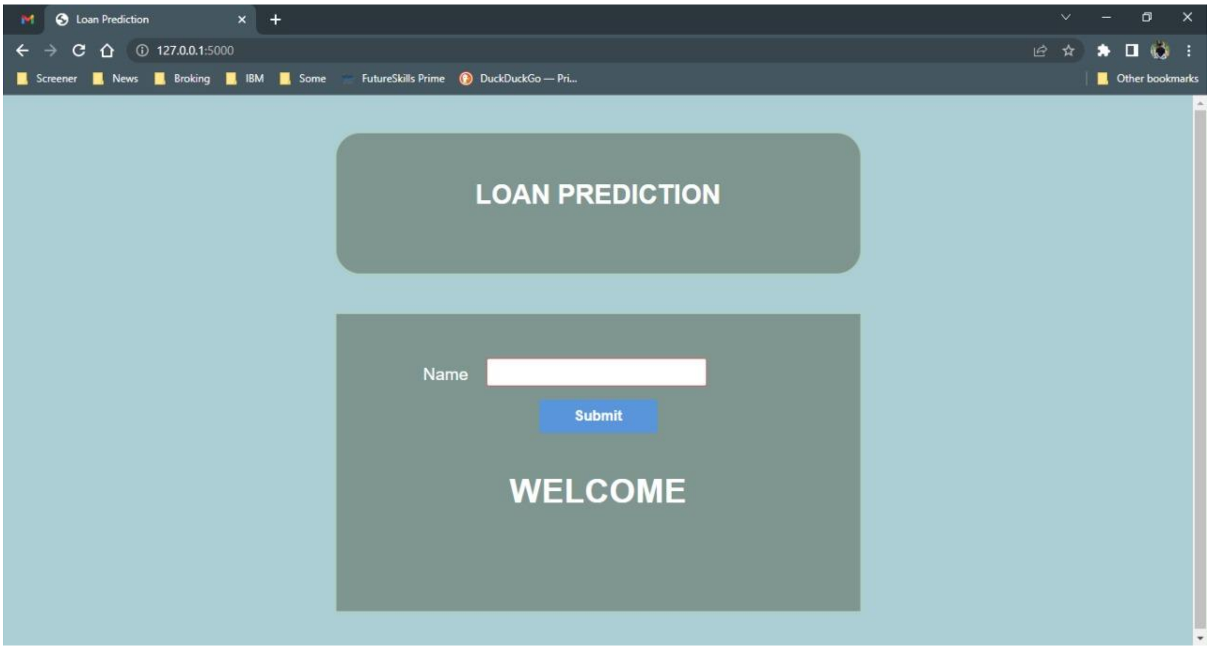
```
  }
    </style>
  </head>
  <body>
    <header class="speaker-form-header">
      <h1>LOAN PREDICTION</h1>
    </header>
    <form action="{{ url_for('evaluate') }}" method="post" class="speaker-form">

      <div class="form-row">
        <label for="Gender">Gender</label>
        <select id="Gender" name="Gender" required>
          <option value="1">Male</option>
          <option value="0">Female</option>
        </select>
      </div>
      <div class="form-row">
        <label for="Married">Married</label>
        <select id="Married" name="Married" required>
          <option value="1">Yes</option>
          <option value="0">No</option>
        </select>
      </div>
      <div class="form-row">
        <label for="Dependents">Dependents</label>
        <input
          id="Dependents"
          name="Dependents"
          type="number"
          min="0"
```

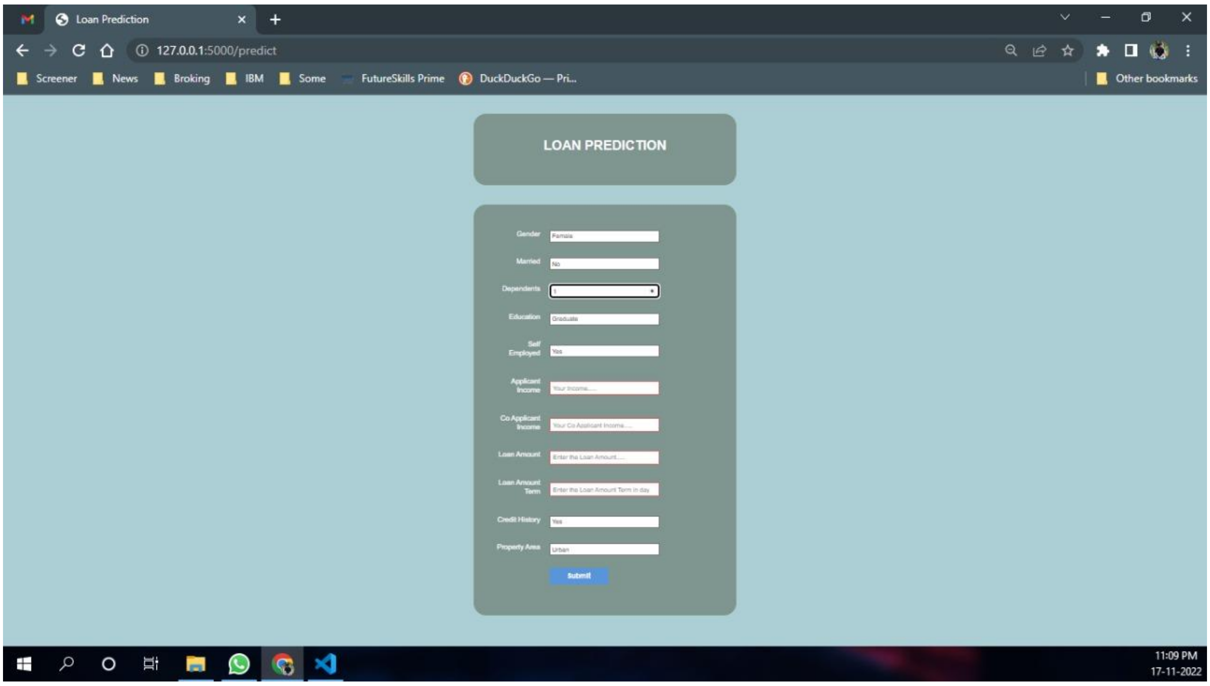


Users > rmith > success.html > html > head > style > .speaker-form

```
    <header class="speaker-form-header">
      <h1>LOAN PREDICTION</h1>
    </header>
    {% block content %}
    <form action="{{ url_for('home') }}" method="post" class="speaker-form">
      <div >
        <!-- <label > -->
            {% if loan == 0 %}
            <center>

                <p style="text-align: center;font-size: xx-large;;margin-top: 20px;">{{result}}</p>
              </center>
            {% endif %}
            {% if loan == 1 %}
            <center>

                <p style="text-align: center;font-size: xx-large;margin-top: 20px;">{{result}}</p>
            </center>
            {% endif %}

        <!-- </label> -->
      </div>
      <br><br>
      <div class="form-row">

        <button style="text-align: center;margin-left: 160px;">Go To Home</button>
      </div>
    </form>
    {% endblock %}
  </body>
```

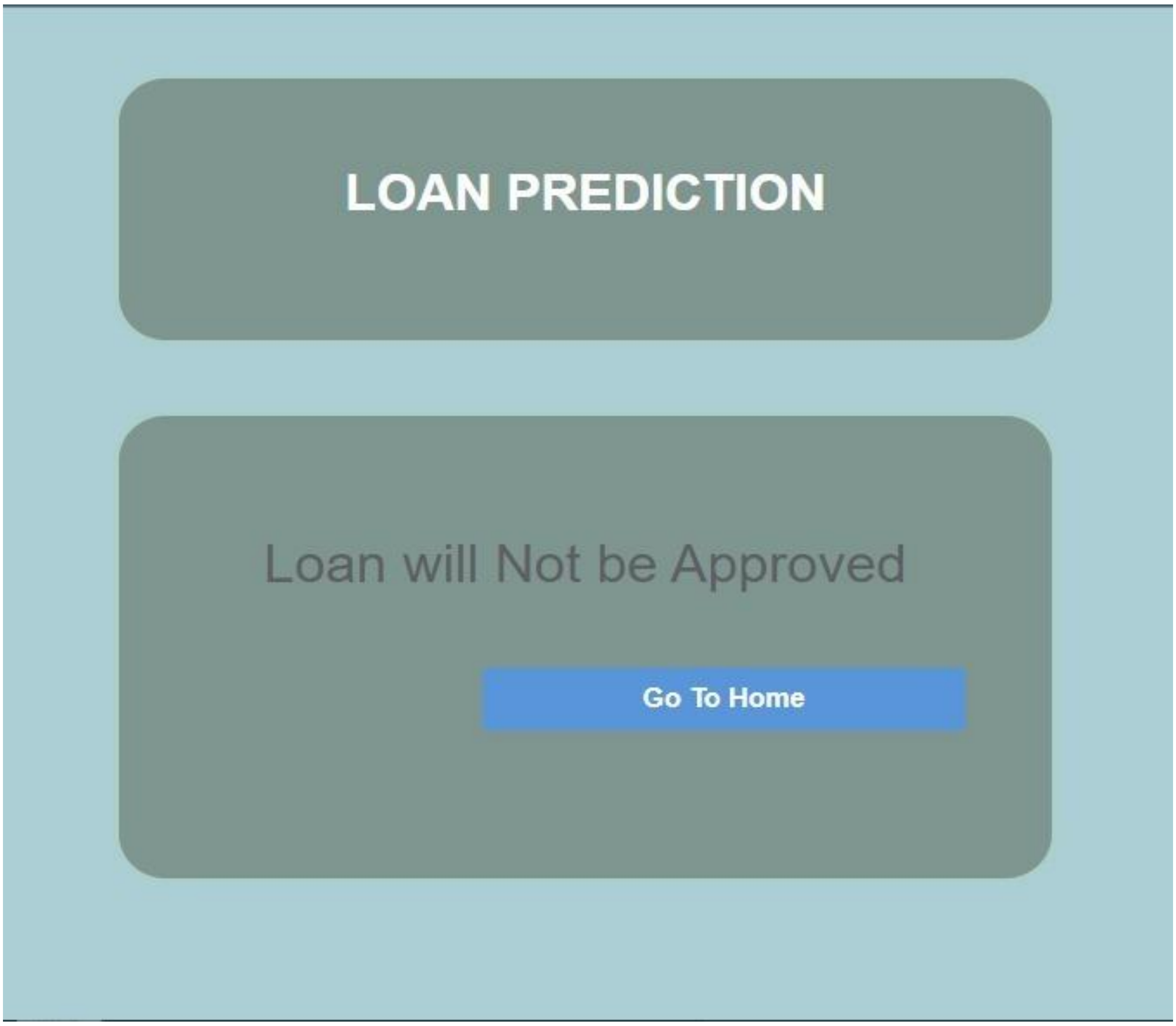
1.1 7.2 FEATURE 2: THE MACHINE LEARNING MODEL PREDICTS THE APPLICANT'SELIGIBILITY





LOAN PREDICTION

Gender	Female
Married	No
Dependents	1
Education	Graduate
Self Employed	Yes
Applicant Income	Your Income......
Co Applicant Income	Your Co Applicant Income......
Loan Amount	Enter the Loan Amount......
Loan Amount Term	Enter the Loan Amount Term in day
Credit History	Yes
Property Area	Urban


LOAN PREDICTION

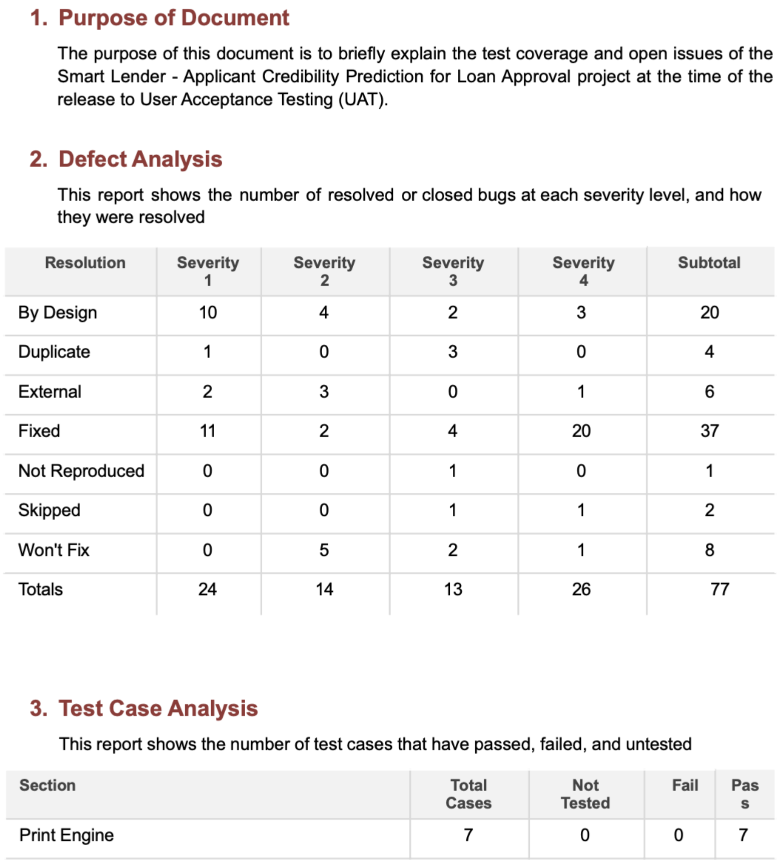
Loan will Not be Approved

8.TESTING

8.1 TEST CASES

Loan_ID	Gender	Married	Dependents	Education	Self-employed	Applicant Income	Co-applicant Income	Loan Amount	Loan Amount Term	Credit History	Property Area	Loan Status
LP001002	Male	No	0	Graduate	No	5849	0		360	1	Urban	Y
LP001003	Male	Yes	1	Graduate	No	4583	1508	128	360	1	Rural	N
LP001005	Male	Yes	0	Graduate	Yes	3000	0	66	360	1	Urban	Y
LP001006	Male	Yes	0	Not Graduate	No	2583	2358	120	360	1	Urban	Y
LP001008	Male	No	0	Graduate	No	6000	0	141	360	1	Urban	Y
LP001011	Male	Yes	2	Graduate	Yes	5417	4196	267	360	1	Urban	Y
LP001013	Male	Yes	0	Not Graduate	No	2333	1516	95	360	1	Urban	Y
LP001014	Male	Yes	3	Graduate	No	3036	2504	158	360	0	Semiurban	N
LP001018	Male	Yes	2	Graduate	No	4006	1526	168	360	1	Urban	Y
LP001020	Male	Yes	1	Graduate	No	12841	10968	349	360	1	Semiurban	N

8.2 USER ACCECPTANCE TESTING



1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the Smart Lender - Applicant Credibility Prediction for Loan Approval project at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis

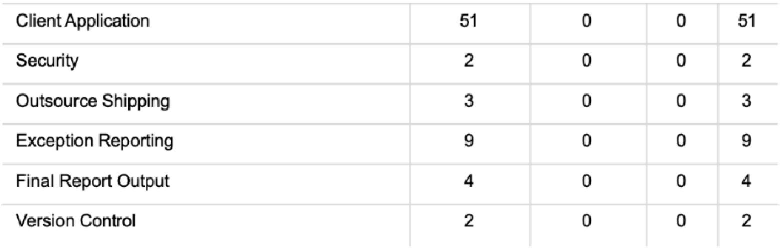
This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	10	4	2	3	20
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	11	2	4	20	37
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	2	1	8
Totals	24	14	13	26	77

3. Test Case Analysis

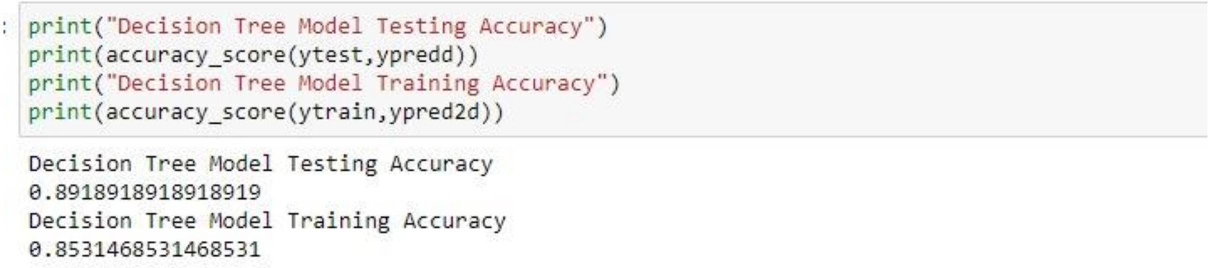
This report shows the number of test cases that have passed, failed, and untested

Section	Total Cases	Not Tested	Fail	Pas s
Print Engine	7	0	0	7
Client Application	51	0	0	51
Security	2	0	0	2
Outsource Shipping	3	0	0	3
Exception Reporting	9	0	0	9
Final Report Output	4	0	0	4
Version Control	2	0	0	2



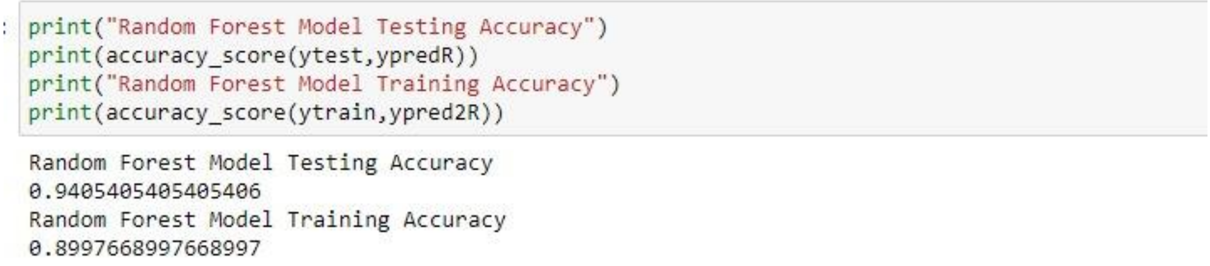
9. RESULTS

9.1 PERFORMANCE METRICS



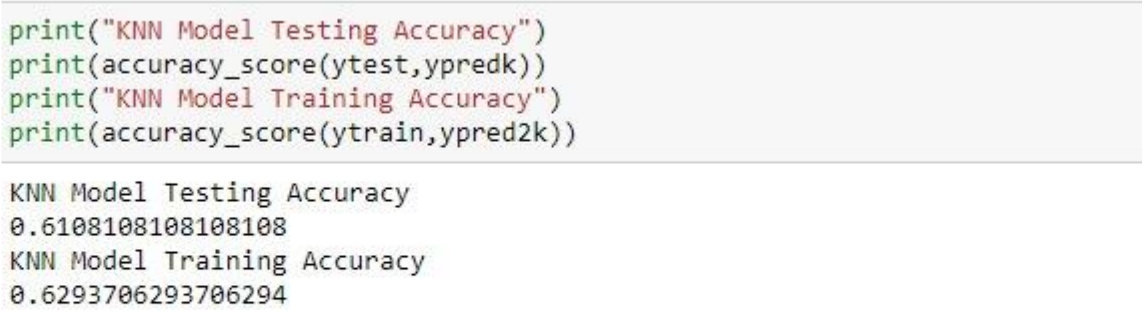
```
print("Decision Tree Model Testing Accuracy")
print(accuracy_score(ytest,ypredd))
print("Decision Tree Model Training Accuracy")
print(accuracy_score(ytrain,ypred2d))
```

```
Decision Tree Model Testing Accuracy
0.8918918918918919
Decision Tree Model Training Accuracy
0.8531468531468531
```



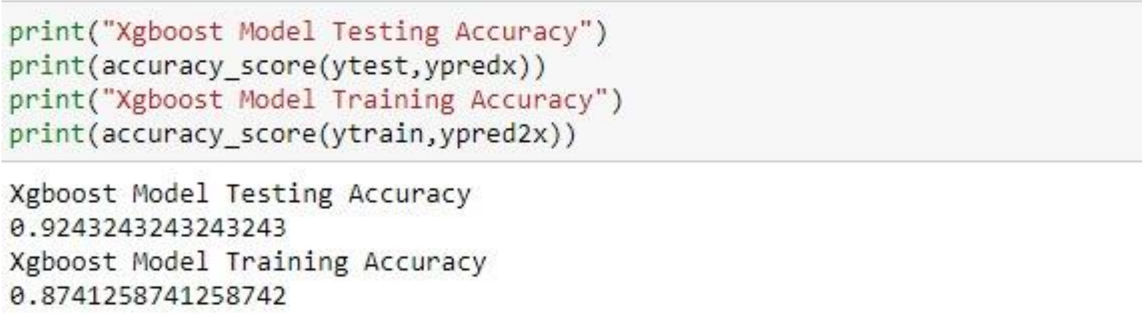
```
print("Random Forest Model Testing Accuracy")
print(accuracy_score(ytest,ypredR))
print("Random Forest Model Training Accuracy")
print(accuracy_score(ytrain,ypred2R))
```

```
Random Forest Model Testing Accuracy
0.9405405405405406
Random Forest Model Training Accuracy
0.8997668997668997
```



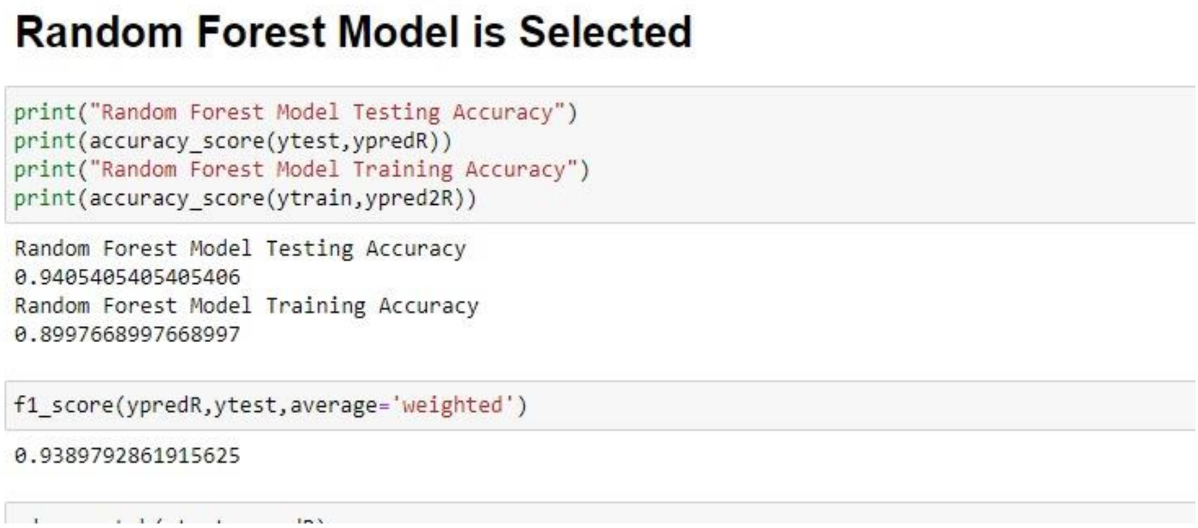
```
print("KNN Model Testing Accuracy")
print(accuracy_score(ytest,ypredk))
print("KNN Model Training Accuracy")
print(accuracy_score(ytrain,ypred2k))
```

```
KNN Model Testing Accuracy
0.6108108108108108
KNN Model Training Accuracy
0.6293706293706294
```



```
print("Xgboost Model Testing Accuracy")
print(accuracy_score(ytest,ypredx))
print("Xgboost Model Training Accuracy")
print(accuracy_score(ytrain,ypred2x))
```

```
Xgboost Model Testing Accuracy
0.9243243243243243
Xgboost Model Training Accuracy
0.8741258741258742
```



Random Forest Model is Selected

```
print("Random Forest Model Testing Accuracy")
print(accuracy_score(ytest,ypredR))
print("Random Forest Model Training Accuracy")
print(accuracy_score(ytrain,ypred2R))
```

```
Random Forest Model Testing Accuracy
0.9405405405405406
Random Forest Model Training Accuracy
0.8997668997668997
```

```
f1_score(ypredR,ytest,average='weighted')
```

```
0.9389792861915625
```

For the purpose of predicting the loan approval status of the applied customer, we have chosen the machine learning approach to study the bank dataset. We have applied variousmachine learning algorithms to decide which one will be the best for applying on the dataset to get the result with the highest accuracy. Most of the algorithm’s accuracy is between 70% -95%, with Random Forest Model having the highest accuracy of 94%.

We also determined the most important features that influence the loan approval status. These most important features are then used on some selected algorithms and their performance accuracy is compared with the instance of using all the features. This model can help the banks in figuring out which factors are important for the loan approval procedure. The comparative study makes us clear about which algorithm will be the bestand ignores the rest, based on their accuracy.

10.ADVANTAGES AND DISADVANTAGES

METRITS

1) The benefit of this system is that by establishing specific conditions and defining the algorithms, we can determine whether a client meets the eligibility requirements simply by evaluating the details.
2) This system is created to forecast if a user's loan application will be granted by the bank based on inputs from the user such as salary, address, loan amount, and loan term.
3) This helps the banks to minimize the possible losses and can increase the volume of credits.
4) Assists the lender in analysing the situation.
5) Gives better services for use.
6) Reduce the risk factor by choosing the right person.
7) Save time and money for the lender.

DEMERITS

1) Instead of using machine learning techniques, they provided a mathematical model.
2) Class inequality was not addressed, nor were the required actions taken.

11.CONCLUSION

In order to eliminate human interference and boost productivity, the rapidly expanding IT sector of today needs to develop new technology and upgrade existing technology. It is abundantly obvious from the data analysis that it lessens all fraud committed at the time of loan acceptance. This application is operationally sound and complies with all banker specifications.

This component is simple to plug into numerous other systems. It operates properly, satisfies all bankers' needs, and is interconnected with numerous other systems. This prediction module can be enhanced and integrated more in the future. The system is trained using prior training data, but it is feasible to alter the software in the future so that it may accept new testing data as well as training data and predict as necessary.

12.FUTURE SCOPE

This paper work can be extended to higher level in future. Predictive model for loans that uses machine learning algorithms, where the results from each graph of the paper can be taken as individual criteria for the machine learning algorithm Z-score has been chosen over normalization (min-max scaling) for scaling the features. Classifiers such as support vector machine, logistic regression or neural network prefer standardization over normalization. Additionally, this paper proposes to use such feature extraction methodologies where maximizing the variance is highly preferred. This can beachieved using standardization. Furthermore, GridSearchCV has been used to optimize the hyperparameters of each classifier. Studies done in perfectly show the effectiveness of GridSearchCV in maximizing the performance of classifiers.

13APPENDIX

SOURCE CODE

APP.py

```
from flask import Flask, render_template,request
import numpy as np
import pandas
import pickle

app = Flask(__name__)
model = pickle.load(open(r'MYMODEL.pkl','rb'))
@app.route("/", methods=['GET', 'POST'])
def home():
    return render_template("home.html")

@app.route("/predict",methods=['POST','GET'])
def predict():
    if request.method == 'POST':
        project_name=request.form['full-name']
        print(project_name)
    return render_template("predict.html",project_name=project_name)

@app.route("/success",methods=['POST','GET'])
def evaluate():
    input_feature = [int(x) for x in request.form.values()]
    print(input_feature)
    input_feature=[np.array(input_feature)]
    print(input_feature)
    names = ['Gender', 'Married', 'Dependents', 'Education', 'Self Employed', 'Applicant Income',
'Coapplicant Income', 'Loan Amount', 'Loan_Amount_Term', 'Credit_History', 'Property_Area']
    data = pandas.DataFrame(input_feature, columns=names)
    print(data)
    prediction=model.predict(data)
    print(prediction)
    prediction = int(prediction)
    print(type(prediction))
    loan=1
    if (prediction == 0):
        loan=0
        return render_template("success.html",result = "Loan will Not be Approved",loan=loan)
    else:
        return render_template("success.html",result = "Loan will be Approved",loan=loan)
    return render_template("success.html")


if __name__ == "__main__":
    app.run(debug=True)
```

Home.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <title>Loan Prediction</title>
    <style>
      * {
    margin: 0;
    padding: 0;
    box-sizing: border-box;
  }

  body {
    color: #5d6063;
    background-color: #acced5;
    font-family: "Helvetica", "Arial", sans-serif;
    font-size: 16px;
    line-height: 1.3;

    display: flex;
    flex-direction: column;
    align-items: center;
  }

  .speaker-form-header {
    text-align: center;
    background-color: #7f9590;
    border: 3px solid #accfc8;
    border-radius: 30px;

    width: 80%;
    margin: 40px 0;
    padding: 50px;
  }

  .speaker-form-header h1 {
    font-size: 30px;
    margin-bottom: 20px;
    color: #fff;
  }

  .speaker-form {
    background-color: #7f9590;
    border: 3px solid #accfc8;
    border-radius: 3px;

    width: 80%;
    padding: 50px;
    margin: 0 0 40px 0;
```

```css
}

.form-row {
  margin-bottom: 40px;
  display: flex;
  justify-content: flex-start;
  flex-direction: column;
  flex-wrap: wrap;
}

.form-row input[type="text"],
.form-row input[type="number"] {
  background-color: #ffffff;
  border: 1px solid #d6d9dc;
  border-radius: 3px;
  width: 100%;
  padding: 7px;
  font-size: 14px;
}

.form-row label {
  margin-bottom: 15px;
}

.form-row input[type="text"]:invalid,
.form-row input[type="number"]:invalid {
  border: 1px solid #d55c5f;
  color: #d55c5f;
  box-shadow: none; /* Remove default red glow in Firefox */
}

.legacy-form-row {
  border: none;
  margin-bottom: 40px;
}

.legacy-form-row legend {
  margin-bottom: 15px;
}

.legacy-form-row .radio-label {
  display: block;
  font-size: 14px;
  padding: 0 20px 0 10px;
}

.legacy-form-row input[type="radio"] {
  margin-top: 2px;
}

.legacy-form-row .radio-label,
.legacy-form-row input[type="radio"] {
  float: left;
}

.form-row select {
  width: 100%;
  padding: 5px;
  font-size: 14px; /* This won't work in Chrome or Safari */
  -webkit-appearance: none; /* This will make it work */
}

.form-row textarea {
  font-family: "Helvetica", "Arial", sans-serif;
  font-size: 14px;

  border: 1px solid #d6d9dc;
  border-radius: 3px;

  min-height: 200px;
  margin-bottom: 10px;
  padding: 7px;
  resize: none;
}

.form-row .instructions {
  color: #999999;
  font-size: 14px;
  margin-bottom: 30px;
}

.form-row .checkbox-label {
  margin-bottom: 0;
}

.form-row button {
  font-size: 16px;
  font-weight: bold;

  color: #ffffff;
  background-color: #5995da;

  border: none;
  border-radius: 3px;

  padding: 10px 40px;
  cursor: pointer;
}

.form-row button:hover {
  background-color: #76aeed;
}

.form-row button:active {
  /* background-color: #407fc7; */
  background-color: pink;
}

@media only screen and (min-width: 700px) {
  .speaker-form-header,
  .speaker-form {
    width: 600px;
  }
  .form-row {
    flex-direction: row;
    align-items: flex-start; /* To avoid stretching */
    margin-bottom: 20px;
  }
  .form-row input[type="text"],
  .form-row input[type='number'],    /* Add */
  .form-row select,                  /* These */
  .form-row textarea {
    /* Selectors */
    width: 250px;
    height: initial;
  }
  .form-row label {
    text-align: right;
}
  width: 120px;
  margin-top: 7px;
  padding-right: 20px;
}
.legacy-form-row {
  margin-bottom: 10px;
}
.legacy-form-row legend {
  width: 120px;
  text-align: right;
  padding-right: 20px;
}
.legacy-form-row legend {
  float: left;
}
.form-row .instructions {
  margin-left: 120px;
}
.form-row .checkbox-label {
  margin-left: 120px;
  width: auto;
}
.form-row button {
  margin-left: 120px;
}
.form-col{
  flex-direction: column;
  align-items: flex-start;
  margin-bottom: 20px;
}
label{
  color: #fff;
```

```
   font-size: larger;
  }
 }
  </style>
 </head>
 <body>
  <header class="speaker-form-header">
   <h1>LOAN PREDICTION</h1>
  </header>
  {% block content %}
  <form action="{{ url_for('predict') }}" method="post" class="speaker-form">
   <div class="form-col">
    <div class="form-row">
     <label for="full-name">Name</label>
     <input id="full-name" name="full-name" type="text" autocomplete="off" required/>
     <button style="text-align: center;margin-left: 180px;">Submit</button>
    </div><br>

   <div >
    <label >
      <center><h1>WELCOME</h1></center>
    </label>
   </div>
   <br><br>
  </div>
  </form>
  {% endblock %}
 </body>
</html>
```

PREDICT.html

```
!DOCTYPE html>
```

```
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <title>Loan Prediction</title>
    <style>
      * {
    margin: 0;
    padding: 0;
    box-sizing: border-box;
  }

  body {
    color: #5d6063;
    background-color: #acced5;
    font-family: "Helvetica", "Arial", sans-serif;
    font-size: 16px;
    line-height: 1.3;

    display: flex;
    flex-direction: column;
    align-items: center;
  }

  .speaker-form-header {
    text-align: center;
    background-color: #7f9590;
    border: 3px solid #accfc8;
    border-radius: 30px;

    width: 80%;
    margin: 40px 0;
    padding: 50px;
```

```
}

.speaker-form-header h1 {
  font-size: 30px;
  margin-bottom: 20px;
  color: #fff;
}

.speaker-form {
  background-color: #7f9590;
  border: 3px solid #accfc8;
  border-radius: 30px;

  width: 80%;
  padding: 50px;
  margin: 0 0 40px 0;
}

.form-row {
  margin-bottom: 40px;
  display: flex;
  justify-content: flex-start;
  flex-direction: column;
  flex-wrap: wrap;
}

.form-row input[type="text"],
.form-row input[type="number"] {
  background-color: #ffffff;
  border: 1px solid #d6d9dc;
  border-radius: 3px;
  width: 100%;
  padding: 7px;
  font-size: 14px;
}

.form-row label {
  margin-bottom: 15px;
}

.form-row input[type="text"]:invalid,
.form-row input[type="number"]:invalid {
  border: 1px solid #d55c5f;
  color: #d55c5f;
  box-shadow: none; /* Remove default red glow in Firefox */
}

.legacy-form-row {
  border: none;
  margin-bottom: 40px;
}

.legacy-form-row legend {
  margin-bottom: 15px;
}

.legacy-form-row .radio-label {
  display: block;
  font-size: 14px;
  padding: 0 20px 0 10px;
}

.legacy-form-row input[type="radio"] {
  margin-top: 2px;
```

```
}

.legacy-form-row .radio-label,
.legacy-form-row input[type="radio"] {
  float: left;
}

.form-row select {
  width: 100%;
  padding: 5px;
  font-size: 14px; /* This won't work in Chrome or Safari */
  -webkit-appearance: none; /* This will make it work */
}

.form-row textarea {
  font-family: "Helvetica", "Arial", sans-serif;
  font-size: 14px;

  border: 1px solid #d6d9dc;
  border-radius: 3px;

  min-height: 200px;
  margin-bottom: 10px;
  padding: 7px;
  resize: none;
}

.form-row .instructions {
  color: #999999;
  font-size: 14px;
  margin-bottom: 30px;
}
```

```
.form-row .checkbox-label {
  margin-bottom: 0;
}

.form-row button {
  font-size: 16px;
  font-weight: bold;

  color: #ffffff;
  background-color: #5995da;

  border: none;
  border-radius: 3px;

  padding: 10px 40px;
  cursor: pointer;
}

.form-row button:hover {
  background-color: #76aeed;
}

.form-row button:active {
  /* background-color: #407fc7; */
  background-color: pink;
}

@media only screen and (min-width: 700px) {
  .speaker-form-header,
  .speaker-form {
    width: 600px;
```

```
}
.form-row {
  flex-direction: row;
  align-items: center; /* To avoid stretching */
  margin-bottom: 20px;
}
.form-row input[type="text"],
.form-row input[type='number'],    /* Add */
.form-row select,                  /* These */
.form-row textarea {
  /* Selectors */
  width: 250px;
  height: initial;
}
.form-row label {
  text-align: right;
  width: 120px;
  margin-top: 7px;
  padding-right: 20px;
}
.legacy-form-row {
  margin-bottom: 10px;
}
.legacy-form-row legend {
  width: 120px;
  text-align: right;
  padding-right: 20px;
}
.legacy-form-row legend {
  float: left;
}
.form-row .instructions {
    margin-left: 120px;
  }
  .form-row .checkbox-label {
    margin-left: 120px;
    width: auto;
  }
  .form-row button {
    margin-left: 120px;
  }
  label{
    color: #fff;
  }
}
  </style>
</head>
<body>
  <header class="speaker-form-header">
    <h1>LOAN PREDICTION</h1>
  </header>
  <form action="{{ url_for('evaluate') }}" method="post" class="speaker-form">

    <div class="form-row">
      <label for="Gender">Gender</label>
      <select id="Gender" name="Gender" required>
        <option value="1">Male</option>
        <option value="0">Female</option>
      </select>
    </div>
    <div class="form-row">
      <label for="Married">Married</label>
      <select id="Married" name="Married" required>
        <option value="1">Yes</option>
        <option value="0">No</option>
      </select>
    </div>
    <div class="form-row">
      <label for="Dependents">Dependents</label>
      <input
        id="Dependents"
        name="Dependents"
        type="number"
        min="0"
        max="3"
        placeholder="No of Dependents on you....."
        required
      />
    </div>
    <div class="form-row">
      <label for="Education">Education</label>
      <select id="Education" name="Education" required>
        <option value="0">Graduate</option>
        <option value="1">Not Graduate</option>
      </select>
    </div>
    <div class="form-row">
      <label for="Self Employed">Self Employed</label>
      <select id="Self Employed" name="Self Employed" required>
        <option value="1">Yes</option>
        <option value="0">No</option>
      </select>
    </div>
    <div class="form-row">
      <label for="Applicant Income">Applicant Income</label>
      <input
```

```
    id="Applicant Income"
    name="Applicant Income"
    type="number"
    min="0"
    placeholder="Your Income....."
    required
  />
</div>
<div class="form-row">
  <label for="Co Applicant Income">Co Applicant Income</label>
  <input
    id="Co Applicant Income"
    name="Co Applicant Income"
    type="number"
    min="0"
    placeholder="Your Co Applicant Income....."
    required
  />
</div>
<div class="form-row">
  <label for="Loan Amount">Loan Amount</label>
  <input
    id="Loan Amount"
    name="Loan Amount"
    type="number"
    min="0"
    placeholder="Enter the Loan Amount....."
    required
  />
</div>
<div class="form-row">
  <label for="Loan Amount Term">Loan Amount Term</label>
  <input
    id="Loan Amount Term"
    name="Loan Amount Term"
    type="number"
    min="0"
    placeholder="Enter the Loan Amount Term in days....."
    required
  />
</div>
<div class="form-row">
  <label for="Credit History">Credit History</label>
  <select id="Credit History" name="Credit History" required>
    <option value="1">Yes</option>
    <option value="0">No</option>
  </select>
</div>
<div class="form-row">
  <label for="Property Area">Property Area</label>
  <select id="Property Area" name="Property Area" required>
    <option value="0">Urban</option>
    <option value="1">Semiurban</option>
    <option value="2">Rural</option>
  </select>
</div>
<!-- <div class="form-row">
  <label for="abstract">Abstract</label>
  <textarea id="abstract" name="abstract"></textarea>
  <div class="instructions">Describe your talk in 500 words or less</div>
</div>
<div class="form-row">
  <label class="checkbox-label" for="available">
    <input
```

```
      id="available"
      name="available"
      type="checkbox"
      value="is-available"
     />
     <span>I’m actually available the date of the talk</span>
    </label>
   </div> -->
   <div class="form-row">
    <button>Submit</button>
   </div>
  </form>
 </body>
</html>

<!DOCTYPE html>
<html lang="en">
 <head>
  <meta charset="UTF-8" />
  <title>Loan Prediction</title>
  <style>
   * {
  margin: 0;
  padding: 0;
  box-sizing: border-box;
 }

 body {
  color: #5d6063;
  background-color: #acced5;
  font-family: "Helvetica", "Arial", sans-serif;
  font-size: 16px;
  line-height: 1.3;

  display: flex;
  flex-direction: column;
  align-items: center;
}

.speaker-form-header {
  text-align: center;
  background-color: #7f9590;
  border: 3px solid #accfc8;
  border-radius: 30px;

  width: 80%;
  margin: 40px 0;
  padding: 50px;
}

.speaker-form-header h1 {
  font-size: 30px;
  margin-bottom: 20px;
  color: #fff;
}

.speaker-form {
  background-color: #7f9590;
  border: 3px solid #accfc8;
  border-radius: 30px;

  width: 80%;
  padding: 50px;
  margin: 0 0 40px 0;
```

```
}

.form-row {
  margin-bottom: 40px;
  display: flex;
  justify-content: flex-start;
  flex-direction: column;
  flex-wrap: wrap;
}

.form-row input[type="text"],
.form-row input[type="number"] {
  background-color: #ffffff;
  border: 1px solid #d6d9dc;
  border-radius: 3px;
  width: 100%;
  padding: 7px;
  font-size: 14px;
}

.form-row label {
  margin-bottom: 15px;
}

.form-row input[type="text"]:invalid,
.form-row input[type="number"]:invalid {
  border: 1px solid #d55c5f;
  color: #d55c5f;
  box-shadow: none; /* Remove default red glow in Firefox */
}

.legacy-form-row {
  border: none;
  margin-bottom: 40px;
}

.legacy-form-row legend {
  margin-bottom: 15px;
}

.legacy-form-row .radio-label {
  display: block;
  font-size: 14px;
  padding: 0 20px 0 10px;
}

.legacy-form-row input[type="radio"] {
  margin-top: 2px;
}

.legacy-form-row .radio-label,
.legacy-form-row input[type="radio"] {
  float: left;
}

.form-row select {
  width: 100%;
  padding: 5px;
  font-size: 14px; /* This won't work in Chrome or Safari */
  -webkit-appearance: none; /* This will make it work */
}

.form-row textarea {
  font-family: "Helvetica", "Arial", sans-serif;
  font-size: 14px;

  border: 1px solid #d6d9dc;
  border-radius: 3px;

  min-height: 200px;
  margin-bottom: 10px;
  padding: 7px;
  resize: none;
}

.form-row .instructions {
  color: #999999;
  font-size: 14px;
  margin-bottom: 30px;
}

.form-row .checkbox-label {
  margin-bottom: 0;
}

.form-row button {
  font-size: 16px;
  font-weight: bold;

  color: #ffffff;
  background-color: #5995da;

  border: none;
  border-radius: 3px;

  padding: 10px 40px;
  cursor: pointer;
}

.form-row button:hover {
  background-color: #76aeed;
}

.form-row button:active {
  /* background-color: #407fc7; */
  background-color: pink;
}

@media only screen and (min-width: 700px) {
  .speaker-form-header,
  .speaker-form {
    width: 600px;
  }
  .form-row {
    flex-direction: row;
    align-items: center; /* To avoid stretching */
    margin-bottom: 20px;
  }
  .form-row input[type="text"],
  .form-row input[type='number'],    /* Add */
  .form-row select,                  /* These */
  .form-row textarea {
    /* Selectors */
    width: 250px;
    height: initial;
  }
  .form-row label {
    text-align: right;
    width: 120px;
    margin-top: 7px;
    padding-right: 20px;
  }
  .legacy-form-row {
    margin-bottom: 10px;
  }
  .legacy-form-row legend {
    width: 120px;
    text-align: right;
    padding-right: 20px;
  }
  .legacy-form-row legend {
    float: left;
  }
  .form-row .instructions {
    margin-left: 120px;
  }
  .form-row .checkbox-label {
    margin-left: 120px;
    width: auto;
  }
  .form-row button {
    margin-left: 120px;
  }
  label{
    color: #fff;
  }
}
  </style>
</head>
<body>
```

```html
<header class="speaker-form-header">
  <h1>LOAN PREDICTION</h1>
</header>
<form action="{{ url_for('evaluate') }}" method="post" class="speaker-form">

  <div class="form-row">
    <label for="Gender">Gender</label>
    <select id="Gender" name="Gender" required>
      <option value="1">Male</option>
      <option value="0">Female</option>
    </select>
  </div>
  <div class="form-row">
    <label for="Married">Married</label>
    <select id="Married" name="Married" required>
      <option value="1">Yes</option>
      <option value="0">No</option>
    </select>
  </div>
  <div class="form-row">
    <label for="Dependents">Dependents</label>
    <input
      id="Dependents"
      name="Dependents"
      type="number"
      min="0"
      max="3"
      placeholder="No of Dependents on you....."
      required
    />
  </div>
  <div class="form-row">
    <label for="Education">Education</label>
    <select id="Education" name="Education" required>
      <option value="0">Graduate</option>
      <option value="1">Not Graduate</option>
    </select>
  </div>
  <div class="form-row">
    <label for="Self Employed">Self Employed</label>
    <select id="Self Employed" name="Self Employed" required>
      <option value="1">Yes</option>
      <option value="0">No</option>
    </select>
  </div>
  <div class="form-row">
    <label for="Applicant Income">Applicant Income</label>
    <input
      id="Applicant Income"
      name="Applicant Income"
      type="number"
      min="0"
      placeholder="Your Income....."
      required
    />
  </div>
  <div class="form-row">
    <label for="Co Applicant Income">Co Applicant Income</label>
    <input
      id="Co Applicant Income"
      name="Co Applicant Income"
      type="number"
      min="0"
      placeholder="Your Co Applicant Income....."
      required
    />
  </div>
  <div class="form-row">
    <label for="Loan Amount">Loan Amount</label>
    <input
      id="Loan Amount"
      name="Loan Amount"
      type="number"
      min="0"
      placeholder="Enter the Loan Amount....."
      required
    />
  </div>
  <div class="form-row">
    <label for="Loan Amount Term">Loan Amount Term</label>
    <input
      id="Loan Amount Term"
      name="Loan Amount Term"
      type="number"
      min="0"
      placeholder="Enter the Loan Amount Term in days....."
      required
    />
  </div>
  <div class="form-row">
    <label for="Credit History">Credit History</label>
    <select id="Credit History" name="Credit History" required>
      <option value="1">Yes</option>
      <option value="0">No</option>
    </select>
  </div>
```

```
      <div class="form-row">
        <label for="Property Area">Property Area</label>
        <select id="Property Area" name="Property Area" required>
          <option value="0">Urban</option>
          <option value="1">Semiurban</option>
          <option value="2">Rural</option>
        </select>
      </div>
      <!-- <div class="form-row">
        <label for="abstract">Abstract</label>
        <textarea id="abstract" name="abstract"></textarea>
        <div class="instructions">Describe your talk in 500 words or less</div>
      </div>
      <div class="form-row">
        <label class="checkbox-label" for="available">
          <input
            id="available"
            name="available"
            type="checkbox"
            value="is-available"
          />
          <span>I’m actually available the date of the talk</span>
        </label>
      </div> -->
      <div class="form-row">
        <button>Submit</button>
      </div>
    </form>
  </body>
</html>
```

SUCCESS.html

```
<!DOCTYPE html>
<html lang="en">
 <head>
  <meta charset="UTF-8" />
  <title>Loan Prediction</title>
  <style>
   * {
  margin: 0;
  padding: 0;
  box-sizing: border-box;
 }

 body {
  color: #5d6063;
  background-color: #acced5;
  font-family: "Helvetica", "Arial", sans-serif;
  font-size: 16px;
  line-height: 1.3;

  display: flex;
  flex-direction: column;
  align-items: center;
 }

 .speaker-form-header {
  text-align: center;
  background-color: #7f9590;
  border: 3px solid #accfc8;
  border-radius: 30px;

  width: 80%;
  margin: 40px 0;
  padding: 50px;
}

.speaker-form-header h1 {
  font-size: 30px;
  margin-bottom: 20px;
  color: #fff;
}

.speaker-form {
  background-color: #7f9590;
  border: 3px solid #accfc8;
  border-radius: 30px;

  width: 80%;
  padding: 50px;
  margin: 0 0 40px 0;
}

.form-row {
  margin-bottom: 40px;
  display: flex;
  justify-content: flex-start;
  flex-direction: column;
  flex-wrap: wrap;
}

.form-row input[type="text"],
.form-row input[type="number"] {
  background-color: #ffffff;
  border: 3px solid #d6d9dc;
  border-radius: 30px;
  width: 100%;
  padding: 7px;
  font-size: 14px;
}

.form-row label {
  margin-bottom: 15px;
}

.form-row input[type="text"]:invalid,
.form-row input[type="number"]:invalid {
  border: 1px solid #d55c5f;
  color: #d55c5f;
  box-shadow: none; /* Remove default red glow in Firefox */
}

.legacy-form-row {
  border: none;
  margin-bottom: 40px;
}

.legacy-form-row legend {
  margin-bottom: 15px;
}

.legacy-form-row .radio-label {
  display: block;
  font-size: 14px;
  padding: 0 20px 0 10px;
}

.legacy-form-row input[type="radio"] {
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}

.legacy-form-row .radio-label,
.legacy-form-row input[type="radio"] {
  float: left;
}

.form-row select {
  width: 100%;
  padding: 5px;
  font-size: 14px; /* This won't work in Chrome or Safari */
  -webkit-appearance: none; /* This will make it work */
}

.form-row textarea {
  font-family: "Helvetica", "Arial", sans-serif;
  font-size: 14px;

  border: 1px solid #d6d9dc;
  border-radius: 3px;

  min-height: 200px;
  margin-bottom: 10px;
  padding: 7px;
  resize: none;
}

.form-row .instructions {
  color: #999999;
  font-size: 14px;
  margin-bottom: 30px;
```

```
}

.form-row .checkbox-label {
  margin-bottom: 0;
}

.form-row button {
  font-size: 16px;
  font-weight: bold;

  color: #ffffff;
  background-color: #5995da;

  border: none;
  border-radius: 3px;

  padding: 10px 40px;
  cursor: pointer;
}

.form-row button:hover {
  background-color: #76aeed;
}

.form-row button:active {
  /* background-color: #407fc7; */
  background-color: pink;
}

@media only screen and (min-width: 700px) {
  .speaker-form-header,
  .speaker-form {
```

```
  width: 600px;
}
.form-row {
  flex-direction: row;
  align-items: flex-start; /* To avoid stretching */
  margin-bottom: 20px;
}
.form-row input[type="text"],
.form-row input[type='number'],    /* Add */
.form-row select,                  /* These */
.form-row textarea {
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  width: 250px;
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}
.form-row label {
  text-align: right;
  width: 120px;
  margin-top: 7px;
  padding-right: 20px;
}
.legacy-form-row {
  margin-bottom: 10px;
}
.legacy-form-row legend {
  width: 120px;
  text-align: right;
  padding-right: 20px;
}
.legacy-form-row legend {
  float: left;
}
```

```
  .form-row .instructions {
    margin-left: 120px;
  }
  .form-row .checkbox-label {
    margin-left: 120px;
    width: auto;
  }
  .form-row button {
    margin-left: 120px;
  }
}
  </style>
</head>
<body>
  <header class="speaker-form-header">
    <h1>LOAN PREDICTION</h1>
  </header>
  {% block content %}
  <form action="{{ url_for('home') }}" method="post" class="speaker-form">
    <div >
      <!-- <label > -->
          {% if loan == 0 %}
          <center>


              <p style="text-align: center;font-size: xx-large;;margin-top: 20px;">{{result}}</p>
            </center>
          {% endif %}
          {% if loan == 1 %}
          <center>


              <p style="text-align: center;font-size: xx-large;margin-top: 20px;">{{result}}</p>
          </center>
```

```
            {% endif %}

        <!-- </label> -->
      </div>
      <br><br>
      <div class="form-row">

        <button style="text-align: center;margin-left: 160px;">Go To Home</button>
      </div>
    </form>
    {% endblock %}
  </body>
</html>
```

GITHUB LINK :