Documentation for Python Flask ML Application

WEEK: 11 – DESIGNING INTELLIGENT SYSTEMS

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GREAT LEARNING

Objective:

To build a Python Flask ML application,

a. Where a user can get registered by entering the username and password and login to the website and then enter their details to check whether they are eligible for loan or not.

b. Where a business admin can fetch the registered user details and generate insights out of it.

c. Build a classification model to predict whether a customer is eligible for loan or not based on a given set of independent variable(s).

Approaches and Documentation of Steps (Using screen shot):

Steps:

Develop a ML application with following functionalities **(The first 4 steps are already developed during the TA session)**

○ **STEP-1**: The application should have a homepage for customers to read some details about the website and buttons for registering and logging in to the application.

○ **STEP-2**: The application should be able to register new customers in the database dynamically in the db which can be used for authentication purposes.

■ This should take username and password and store the details in the user database.

○ **STEP-3**: The application should be able to allow an existing customer to login to the website using correct credentials.

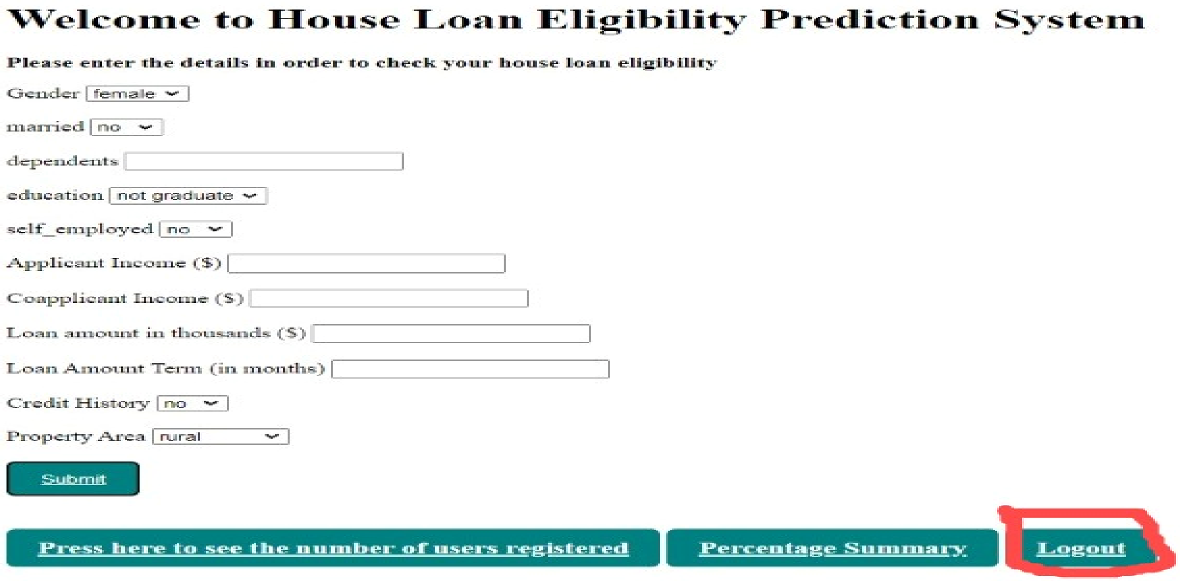
■ Only a registered user with a correct password can be logged in.

○ **STEP-4**: Once the user has logged in, there should be an endpoint to check for loan approval status. The user needs to enter the details to get the loan eligibility status.

Used The above Source Code of TA Session and Developed the Below mentioned steps:

○ **STEP-5 (Logout Option)**: Developed the logout option to the prediction page(prediction.html), the logout option will redirect the page to login page (login.html).

Refer to Pic:1.1 for logout option.



Welcome to House Loan Eligibility Prediction System

Please enter the details in order to check your house loan eligibility

Gender female

married no

dependents

education not graduate

self_employed no

Applicant Income ($)

Coapplicant Income ($)

Loan amount in thousands ($)

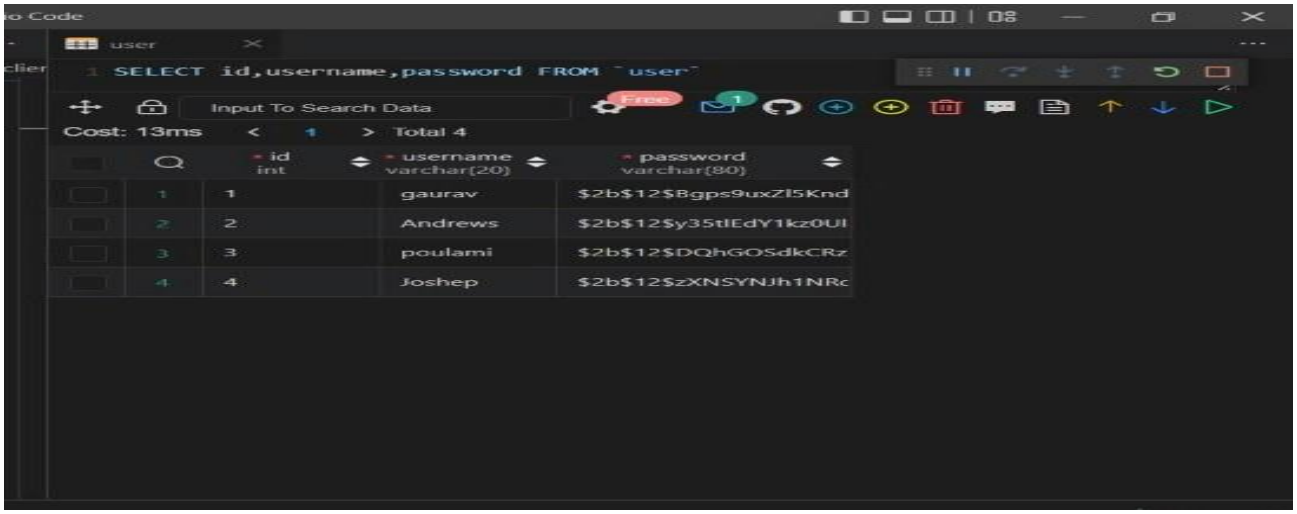
Loan Amount Term (in months)

Credit History no

Property Area rural

Pic: 1.1 Logout Option.

○ **STEP-6 (Database Creation and Predicted Outcome in the database)**: Created two tables in the a single database name as **my_loan_db.sql.** The table names are **user** and **user_details.** The user table consists of **id, username**, and **password** columns.
Refer to Pic:1.2 for user table.
Refer to Pic:1.3 & Pic: 1.4 for user_details table.

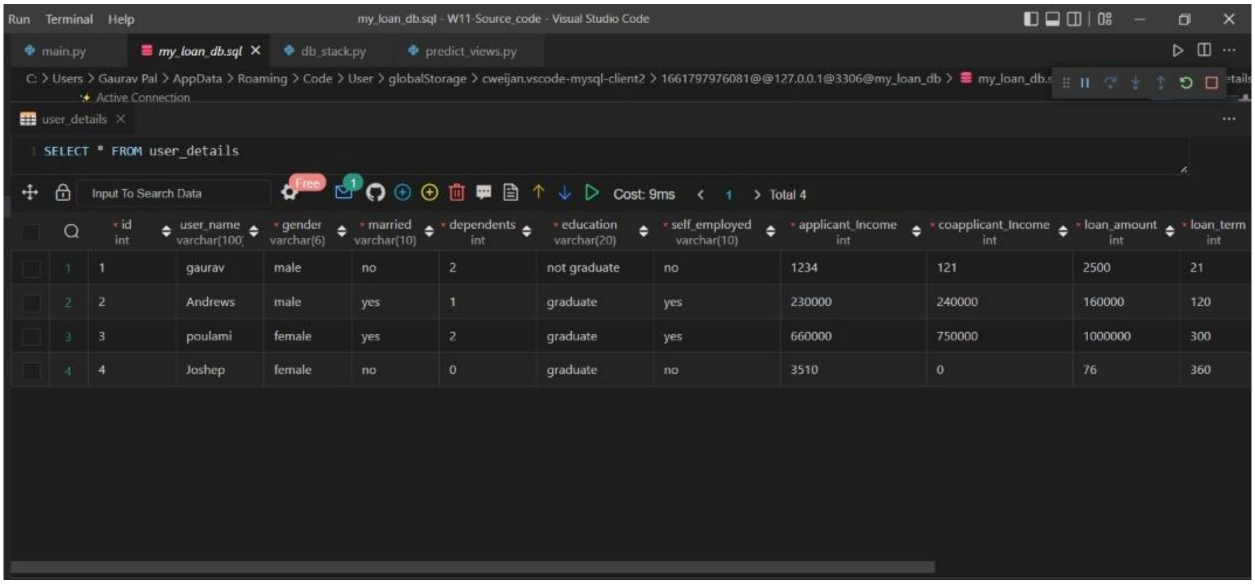


```
SELECT id,username,password FROM `user`
```

Cost: 13ms < 1 > Total 4

	id int	username varchar(20)	password varchar(80)
1	1	gaurav	$2b$12$8gps9uxZI5Knd
2	2	Andrews	$2b$12$y35tIEdY1kz0UI
3	3	poulami	$2b$12$DQhGOSdkCRz
4	4	Joshep	$2b$12$zXNSYNJh1NRc

Pic: 1.2 user table.

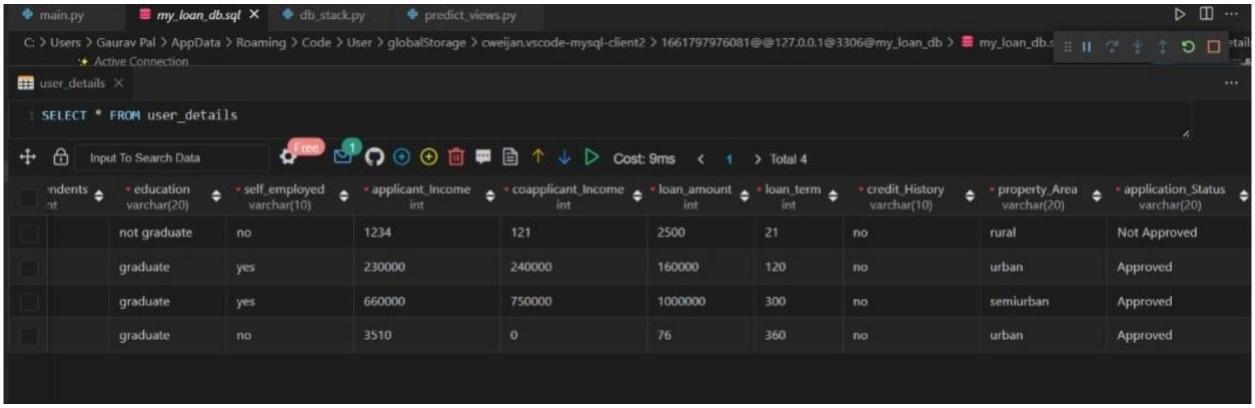


Run Terminal Help
my_loan_db.sql - W11-Source_code - Visual Studio Code
main.py
my_loan_db.sql
db_stack.py
predict_views.py
C: > Users > Gaurav Pal > AppData > Roaming > Code > User > globalStorage > cweijan.vscode-mysql-client2 > 1661797976081@@127.0.0.1@3306@my_loan_db > my_loan_db.s
Active Connection
user_details
Input To Search Data
Free
Cost: 9ms
1
Total 4

```sql
SELECT * FROM user_details
```

	id int	user_name varchar(100)	gender varchar(6)	married varchar(10)	dependents int	education varchar(20)	self_employed varchar(10)	applicant_Income int	coapplicant_Income int	loan_amount int	loan_term int
1	1	gaurav	male	no	2	not graduate	no	1234	121	2500	21
2	2	Andrews	male	yes	1	graduate	yes	230000	240000	160000	120
3	3	poulami	female	yes	2	graduate	yes	660000	750000	1000000	300
4	4	Joshep	female	no	0	graduate	no	3510	0	76	360

Pic: 1.3 user_details table.



main.py
my_loan_db.sql
db_stack.py
predict_views.py
C: > Users > Gaurav Pal > AppData > Roaming > Code > User > globalStorage > cweijan.vscode-mysql-client2 > 1661797976081@@127.0.0.1@3306@my_loan_db > my_loan_db.s
Active Connection
user_details
Input To Search Data
Free
Cost: 9ms
1
Total 4

```sql
SELECT * FROM user_details
```

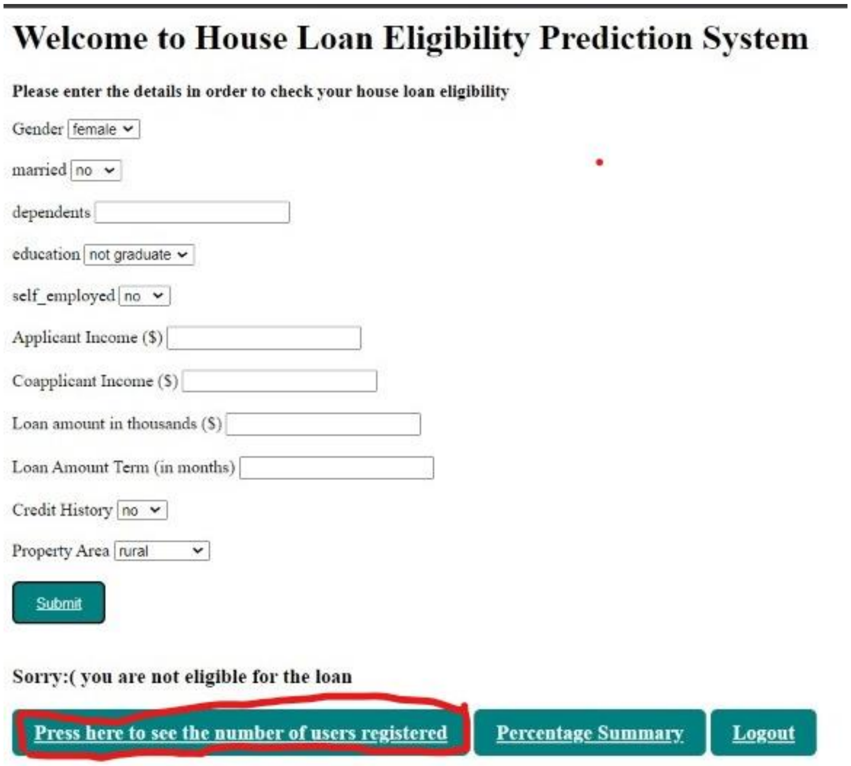
ndents nt	education varchar(20)	self_employed varchar(10)	applicant_Income int	coapplicant_Income int	loan_amount int	loan_term int	credit_History varchar(10)	property_Area varchar(20)	application_Status varchar(20)
	not graduate	no	1234	121	2500	21	no	rural	Not Approved
	graduate	yes	230000	240000	160000	120	no	urban	Approved
	graduate	yes	660000	750000	1000000	300	no	semiurban	Approved
	graduate	no	3510	0	76	360	no	urban	Approved

Pic: 1.4 user_details table showing the predicted outcome that was stored in the db.

○ **STEP-7** (Statistical summary of all registered users): At the prediction page you can get the statistical summary of all registered users by clicking the button (**Press here to see the number of users registered**) in a JSON format. The current page will redirect to the **127.0.0.1:6622/user_count** page for the summary

Refer to Pic:1.5 for button to access statistical summary.

Refer to Pic:1.6 for statistical summary.



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dependents

education not graduate

self_employed no

Applicant Income ($)

Coapplicant Income ($)

Loan amount in thousands ($)

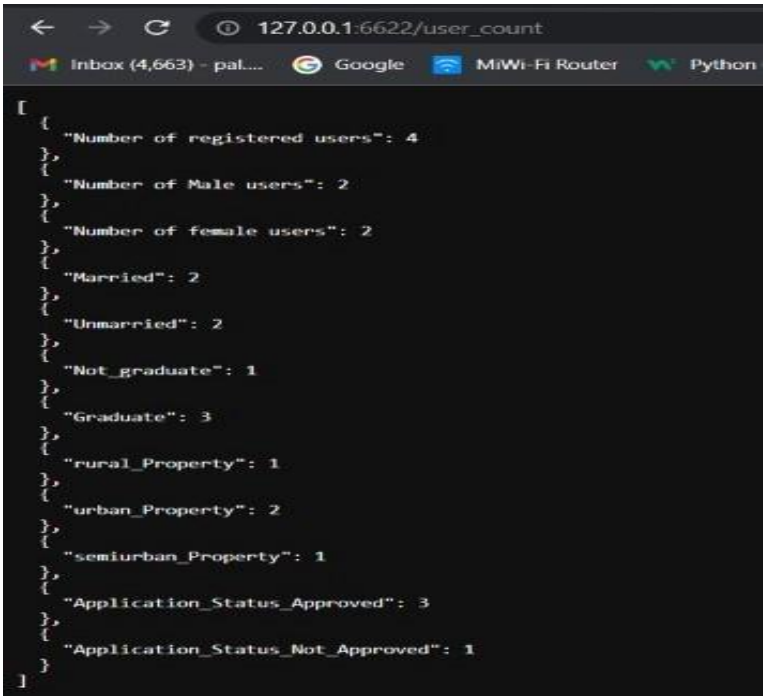
Loan Amount Term (in months)

Credit History no

Property Area rural

Sorry:(you are not eligible for the loan

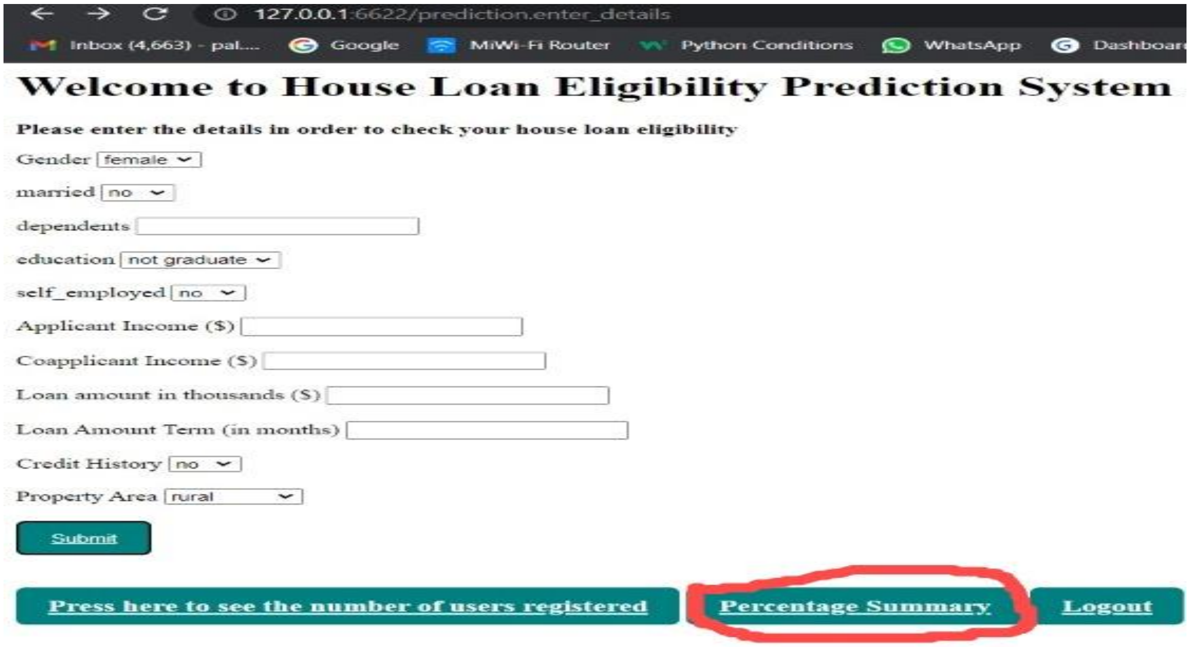
Pic: 1.5 The marked button will redirect the to 127.0.0.1:6622/user_count to get statistical summary.



```
[
  {
    "Number of registered users": 4
  },
  {
    "Number of Male users": 2
  },
  {
    "Number of female users": 2
  },
  {
    "Married": 2
  },
  {
    "Unmarried": 2
  },
  {
    "Not_graduate": 1
  },
  {
    "Graduate": 3
  },
  {
    "rural_Property": 1
  },
  {
    "urban_Property": 2
  },
  {
    "semiurban_Property": 1
  },
  {
    "Application_Status_Approved": 3
  },
  {
    "Application_Status_Not_Approved": 1
  }
]
```

Pic: 1.6 Statistical summary in JSON format.

○ **STEP-8 (Percentage of users loan approved as a endpoint outcome summary):** The **Percentage Summary** button at prediction page will redirect to 127.0.01:6622/summary_outcome page as a endpoint to fetch the outcome summary as JSON format.
Refer to Pic:1.7 for button to access percentage of loan approved.
Refer to Pic:1.8 for Percentage summary in JSON format



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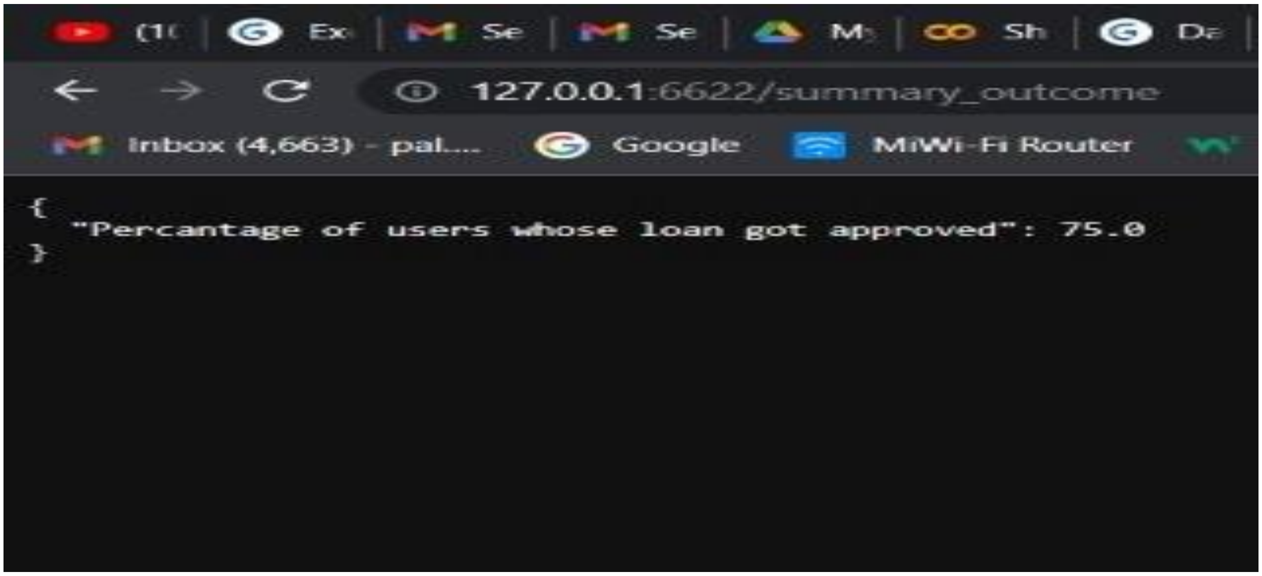
dependents
education not graduate
self_employed no
Applicant Income ($)
Coapplicant Income ($)
Loan amount in thousands ($)
Loan Amount Term (in months)
Credit History no
Property Area rural

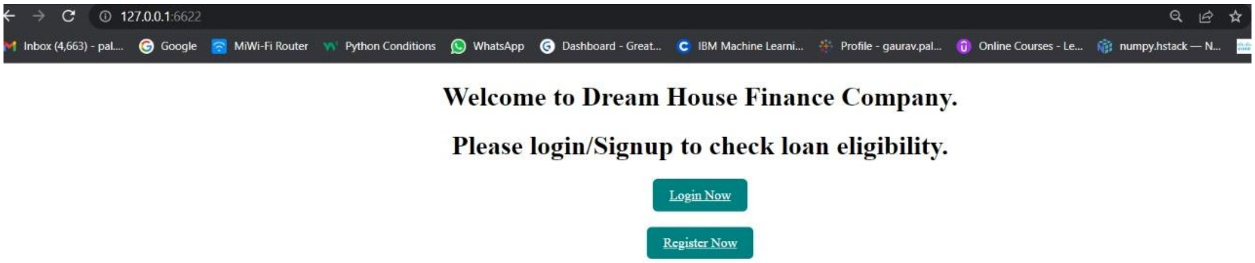
Pic: 1.7 The marked button will redirect the to 127.0.0.1:6622/summary_outcome.



```
{
  "Percantage of users whose loan got approved": 75.0
}
```

Pic: 1.8 Percentage summary in JSON format.

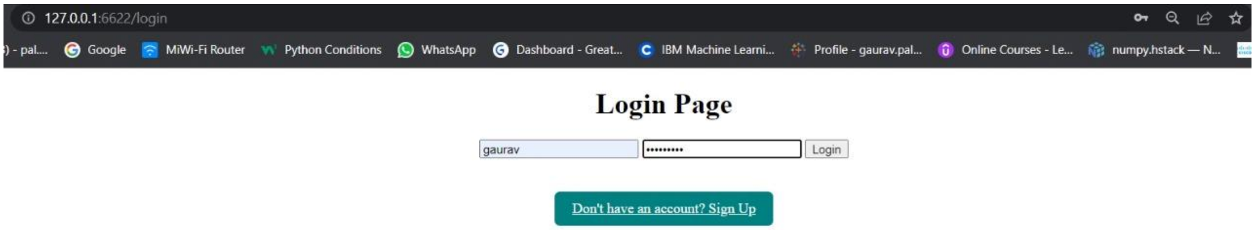
Visualization of HTML Pages:



Welcome to Dream House Finance Company.

Please login/Signup to check loan eligibility.

Pic: 1.9 Home Page (home.html).

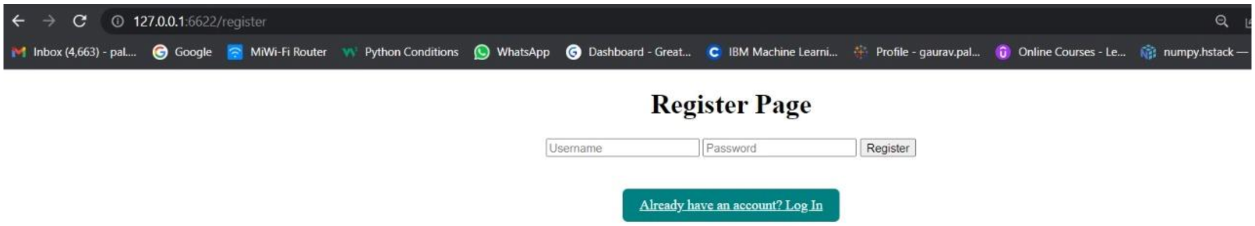

127.0.0.1:6622/login
) - pal... Google MiWi-Fi Router Python Conditions WhatsApp Dashboard - Great... IBM Machine Learni... Profile - gaurav.pal... Online Courses - Le... numpy.hstack — N...

Login Page

gaurav •••••••••

Login
Don't have an account? Sign Up

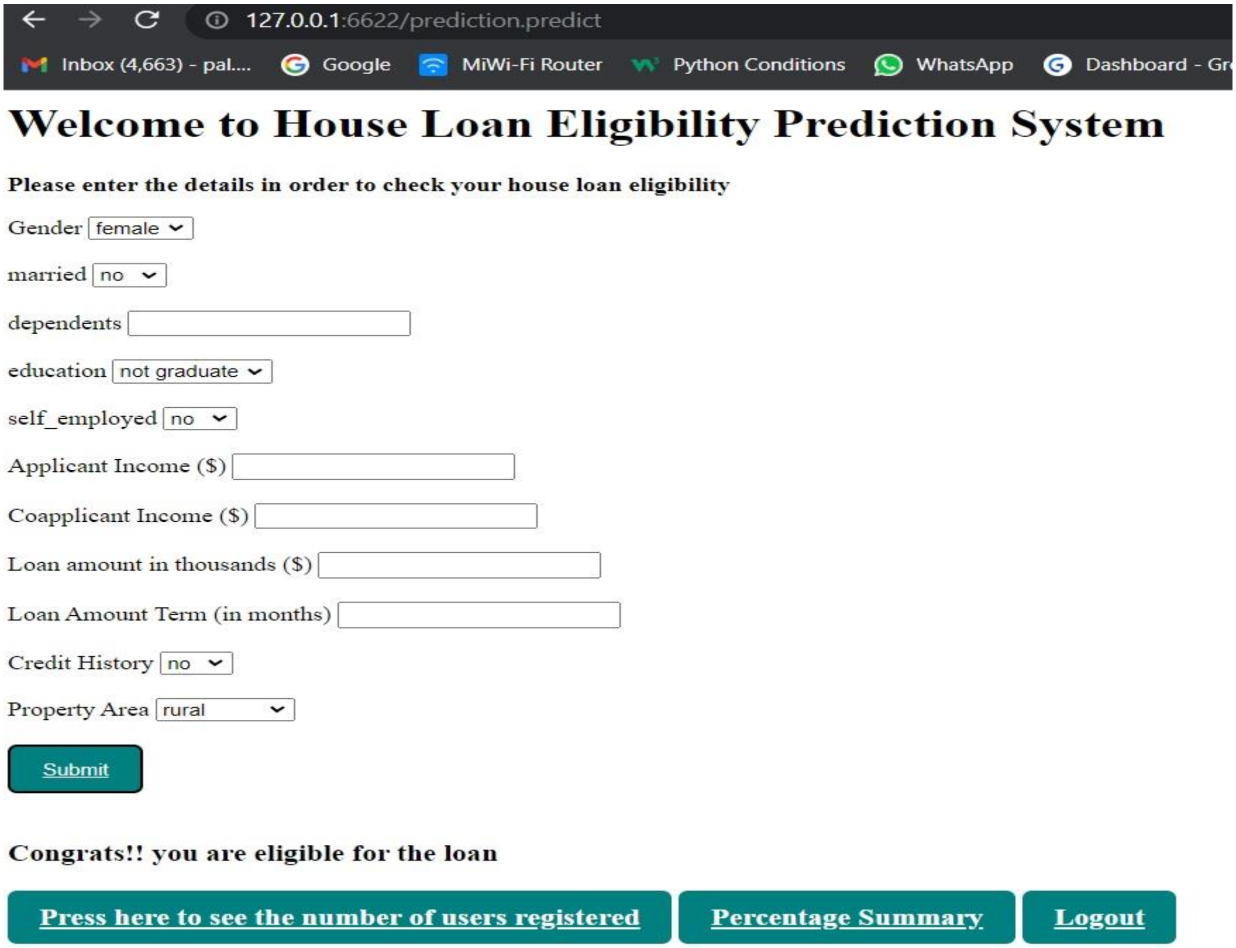
Pic: 1.10 Login Page (login.html).


127.0.0.1:6622/register
Inbox (4,663) - pal... Google MiWi-Fi Router Python Conditions WhatsApp Dashboard - Great... IBM Machine Learni... Profile - gaurav.pal... Online Courses - Le... numpy.hstack —

Register Page

Username
Password
Register
Already have an account? Log In

Pic: 1.11 Register Page (register.html).



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Gender: female

married: no

dependents:

education: not graduate

self_employed: no

Applicant Income ($):

Coapplicant Income ($):

Loan amount in thousands ($):

Loan Amount Term (in months):

Credit History: no

Property Area: rural

Congrats!! you are eligible for the loan

Pic: 1.12 Prediction Page (predict.html), showing the predicted output.

Please Note: I have created the model as a pickle file (model_dt_classifier.pkl) using Model Building and Pickling.ipnyb file. I have done all the data preprocessing, visualization and standardization. I have used Ada boost Classifier, Random forest Classifier, Decision Tree Classifier, among which Decision Tree Classifier accuracy is higher so used Decision Tree Classifier for model building. I have submitted the Model Building and Pickling.ipnyb file as HTML format.
