UNIVERSITY ADMIT ELIGIBELITY PREDICTOR

TEAM ID: PNT2022TMID07321

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1.INTRODUCTION

1.1.Project Overview

Students are often worried about their chances of admission to University. The aim of this project is to help students in shortlisting universities with their profiles. The predicted output gives them a fair idea about their admission chances in a particular university. This analysis should also help students who are currently preparing or will be preparing to get a better idea.

1.2.Purpose

A persons education plays a vital role in their life. While planning for education students often have several questions regarding the courses, universities, job opportunities, expenses involved, etc. Securing admission in their dream university is one of their main concerns. It is seen that often students prefer to pursue their education from universities which have global recognition.

2. LITERATURE SURVEY

When it comes to international students the first choice of the majority of them is the United States of America. With the majority of worlds highly reputed universities, wide range of courses offered in every sector, highly accredited education system and teaching, scholarships provided to students, best job market and many more advantages make it the dream destination for the international 1 students. According to research, there are above 8 Million international students studying in more than 1700 public and 2500 private universities and colleges across the USA.

2.1 Existing problem

Universities take into consideration different factors like score on aptitude based examination like the General Record Examination (GRE), command over the English language is judged based on their score in English competency test like Test Of English as a Foreign Language (TOEFL) OR International English Language Testing System (IELTS), their work experience in same or other fields, the quality of the Letters Of Recommendation (LOR) and the Statement Of Purpose documents provided by the student etc. Based on the overall profile of the student decision is taken by the universities admission team to admit or reject a particular candidate.

2.2 Reference

1.Aljasmi, S., Nassif, A.B., Shahin, I. and Elnagar, A., 2020. Graduate admission prediction using machine learning. Int. J. Comput. Commun, 14, pp.79- 83.

2.A.H.M. Ragab, A. F. S. Mashat and A. M. Khedra, "HRSPCA: Hybrid recommender system for predicting college admission," 2012 12th International Conference on Intelligent Systems Design and Applications (ISDA), 2012, pp. 107- 113, doi: 10.1109/ISDA.2012.6416521.

3.H. Fathiya and L. Sadath, "University Admissions Predictor Using Logistic Regression," 2021 International Conference on Computational Intelligence and Knowledge Economy (ICCIKE), 2021, pp. 46-51, doi: 10.1109/ICCIKE51210.2021.9410717.

4.AlGhamdi, A., Barsheed, A., AlMshjary, H. and AlGhamdi, H., 2020, March. A machine learning approach for graduate admission prediction. In Proceedings of the 2020 2nd International Conference on Image, Video and Signal Processing (pp. 155-158).

2.3 Problem Statement Definition

Build an application that predicts the university admission chances of a student powered by machine learning models. Train the model and host it on IBM cloud. The majority of international students studying in the USA are from India and China. In the past decade, India has seen a huge increase in the number of students opting to pursue their education from foreign universities in countries like The USA, Ireland, Australia, Germany, etc. Although there are significant universities and colleges in India, students are finding it difficult to get admission in the highly ranked colleges and also getting a job is a challenge as the ratio of number students to the number work opportunities available is quite high. India is one of the leading counties in the number of software engineers produced each year; it becomes tough for the students to find jobs in elite companies due to high competition. This motivates a good number of students to pursue post-graduation in their field. It is seen that the number of students pursuing Masters in Computer Science field from universities in the USA is quite high; the focus of this research will be on these students .

3. REQUIREMENT ANALYSIS

The project aims to develop an application that uses artificial intelligence with the help of chat bot to customize products for the customers which enhances the fame of ecommerce store and reduce the time which customers spends on choosing products. The application also uses IBM cloud storage for storing objects. An application that predicts the university admission chances of a student powered by machine learning models. Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. The primary objective of this research is to develop a system to solve the problems the international students are facing while applying for universities in the USA.

3.1 Empathy Map Canvas
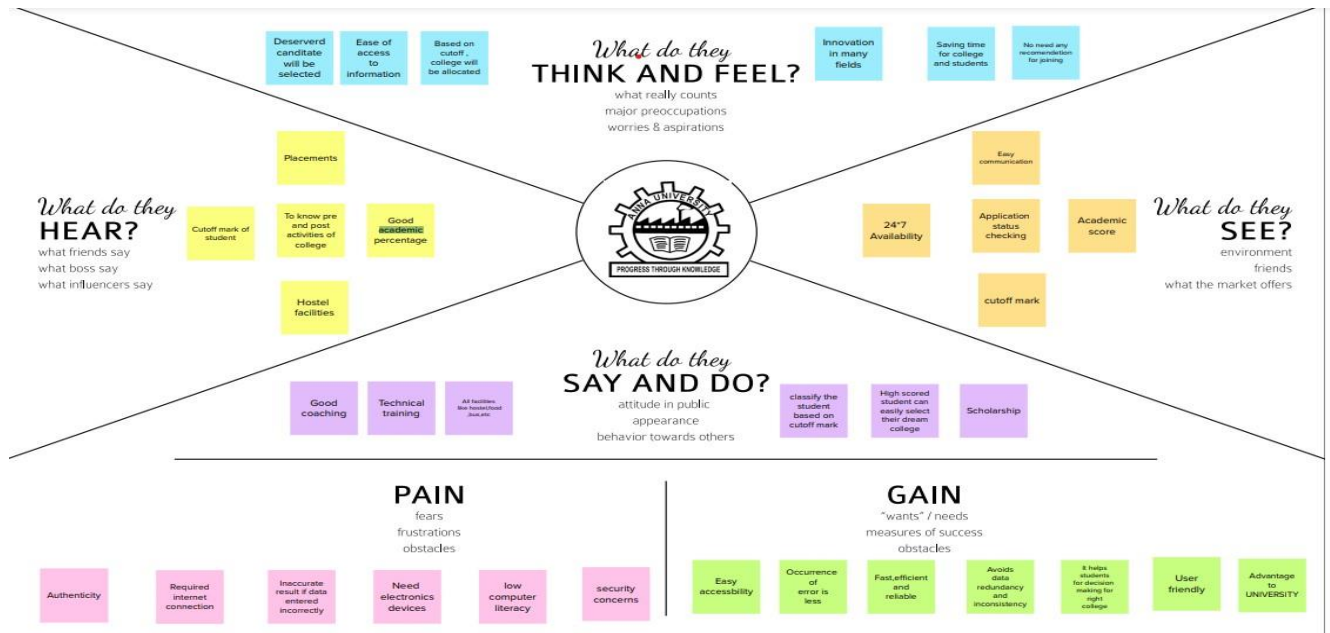
3.2 Ideation & Brainstorming
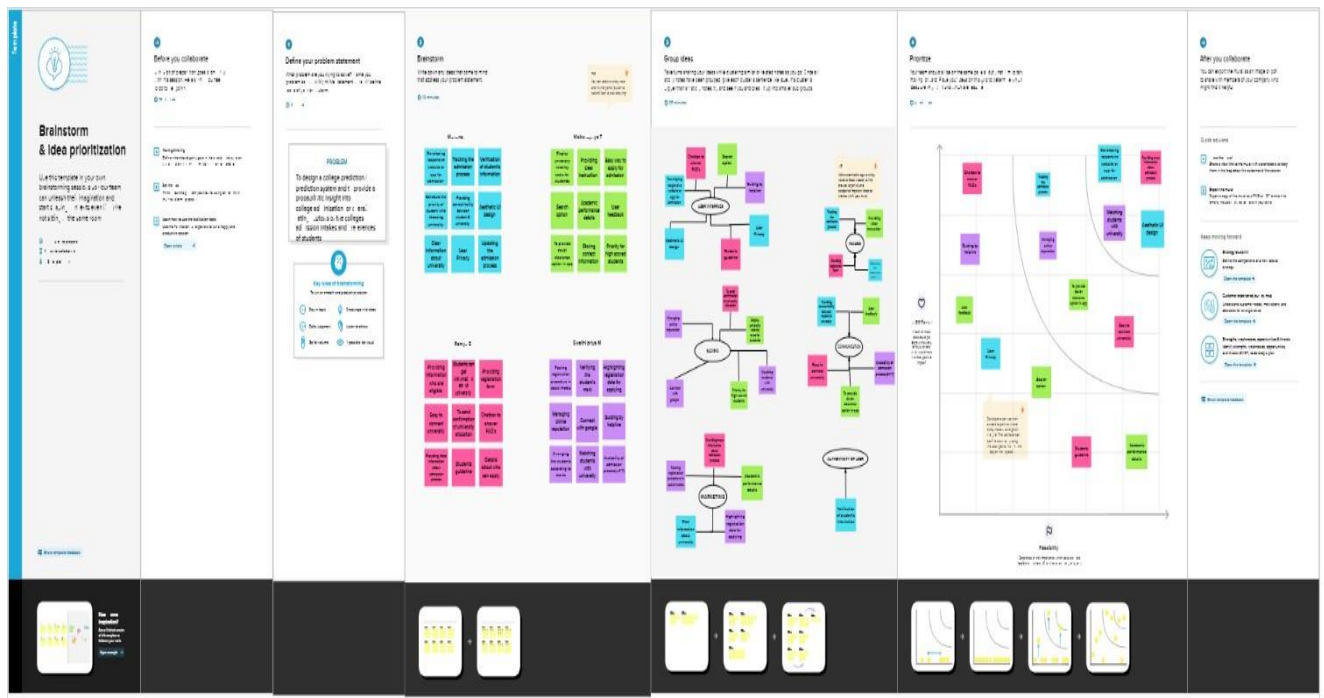
This task of shortlisting the universities where the student has high chances of admission is difficult for mainly for the international students, so they end up with applying to many universities in hopes of getting admission in few of them thus investing an extra amount of money in the applications. There are several portals and websites which provide information and help to students in shortlisting the universities, but they are not reliable. Most of the students dont take the risk of evaluating the colleges by themselves, and they seek the help of the education consultancy firms to do it for them. Again for this students have to pay a huge amount of fee to the education consultant.

3.3 Proposed Solution

Finally, K Nearest Neighbours and Decision Tree algorithms were used as they were found to be the best fit for the system developed. Also, we will be creating a simple user interface which will help the users to input the data related to student profile and get the predicted result for the application based on the profile as output. This research will thus eventually help students saving the extra amount of time and money they have to spend at the education consultancy firms. And also it will help them to limit their number of application to a small number by proving them the suggestion of the universities where they have the best chance of securing admission thus saving more money on the application fees.

3.4 Problem Solution fit

We will be developing a University Admit Eligibility Predictor system which will help the students to predict the chances of their application being selected for a particular university for which they wish to apply based on their profile. Also, the system will provide a recommendation of universities to the student to which the student has a high possibility of getting admission. Multiple machine learning classification algorithms were evaluated to develop the system.

4. REQUIREMENT ANALYSIS

Requirements analysis, also called requirements engineering, is the process of determining user expectations for a new or modified product. These features, called requirements, must be quantifiable, relevant and detailed. In software engineering, such requirements are often called functional specifications. Requirements analysis is critical to the success or failure of a systems or software project. The requirements should be documented, actionable, measurable, testable, traceable, related to identified business needs or opportunities, and defined to a level of detail sufficient for system design

4.1 Functional requirement
- Predicton
- Input form
- Percentage of chance

4.2 Non-Functional requirements
- Speed
- Security
- Portability
- Compatibility
- Capacity
- Reliability
- Environment
- Localization

5. PROJECT DESIGN

5.1 Data Flow Diagrams
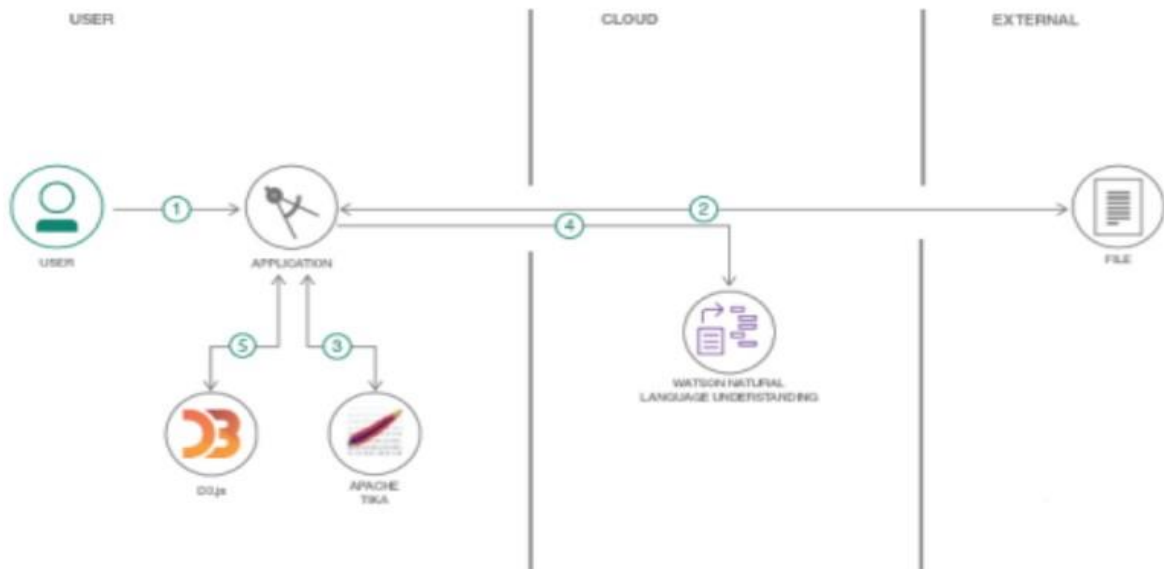
5.2 Solution & Technical Architecture

Solution architecture is a complex process – with many sub-processes – that bridges the 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, behavior, and other aspects of the software to project stakeholders.

● Define features, development phases, and solution requirements. Provide specifications according to which the solution is defined, managed, and delivered.
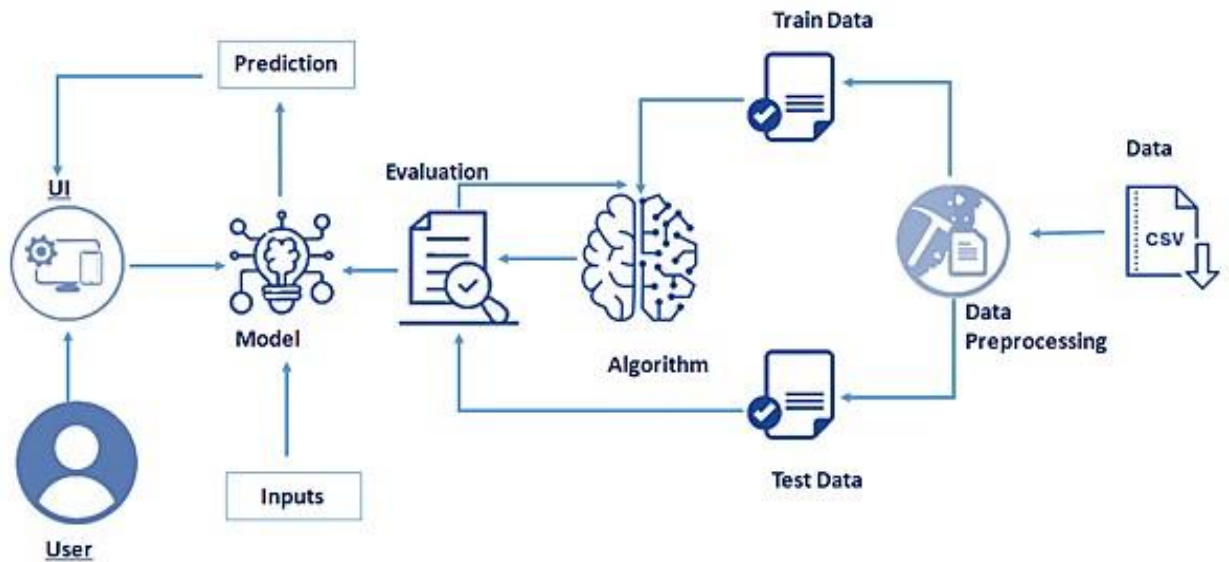
Example - Solution Architecture Diagram:

Reference:

https://images.app.goo.gl/avSn4z3bM5KD8jt39
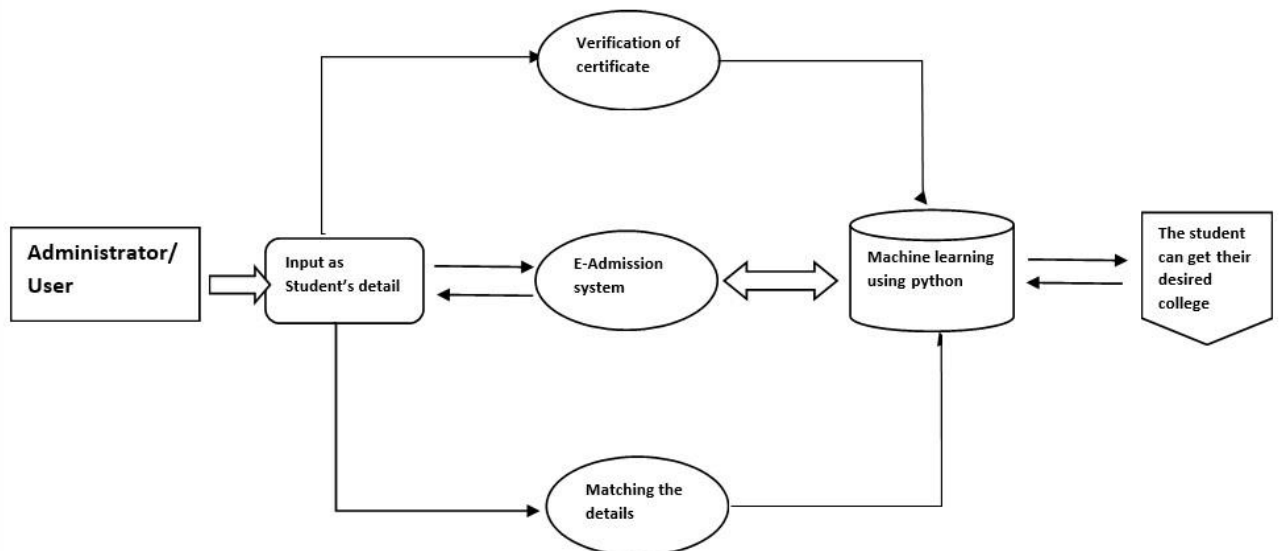
5.3 User Stories

A user story is an informal, natural language description of features of a software system. They are written from the perspective of an end user or user of a system, and may be recorded on index cards, Post-it notes, or digitally in project management software.[1] Depending on the project, user stories may be written by different stakeholders like client, user, manager, or development team.

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 register & access the dashboard with Gmail Login	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password	I can log in and access my account / dashboard	High	Sprint-1
	Dashboard	USN-6	User need the internet and smart mobile phones to access it	To access and login , we need internet connection.	High	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 in the website	I can access my account / dashboard	High	Sprint-1
	Login	USN-8	As a user, I can log into the application by entering email & password in the website of university	I can log in and access my account / dashboard	High	Sprint-1
	Dashboard	USN-9	User need the internet and smart mobile phones to access it	To access and login , we need internet connection.	High	Sprint-1
Customer Care Executive	Registration & Login	USN-10	The customer care give the instruction and guide line for the students to register and login their ID	The instruction and guidelines are provided	High	Sprint-1
Administrator	Registration	USN-11	The Administrator can see how many students are registered in the website	Administrator can access account / dashboard	High	Sprint-1
	Login	USN-12	The Administrator can login and see the student's detail in their portal	Administrator can access the website	High	Sprint-1
	Dashboard	USN-13	The Administrator needs the internet for website accessing	To access and login , administrator need internet connection	High	Sprint-1

# 6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Sprint-1	User Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High
Sprint-2		USN-3	As a user, I can check the eligibility criteria for various universities by uploading the necessary documents	2	Low

Sprint		USN-4	As a user, I can register for the desired university through Gmail and can also upload further course completion documents if necessary.	2	Medium
Sprint-2					
Sprint-4	User Login	USN-5	As a user, I can log into the application by entering email & password	1	High
	Dashboard		Check dashboard for further updates and upload the details according to the desired and eligible universities based on the eligibility criteria.		

6.2 Sprint Delivery Schedule

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed	Sprint Release Date
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	30 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	06 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	15	13 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	25	20 Nov 2022

6.3 Reports from JIRA

BURNDOWN CHART
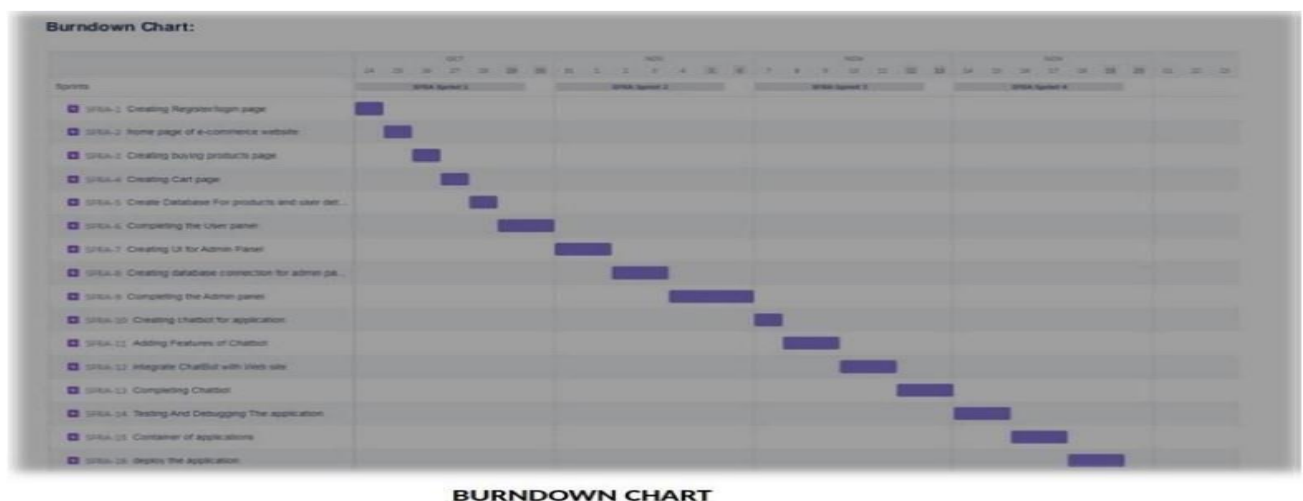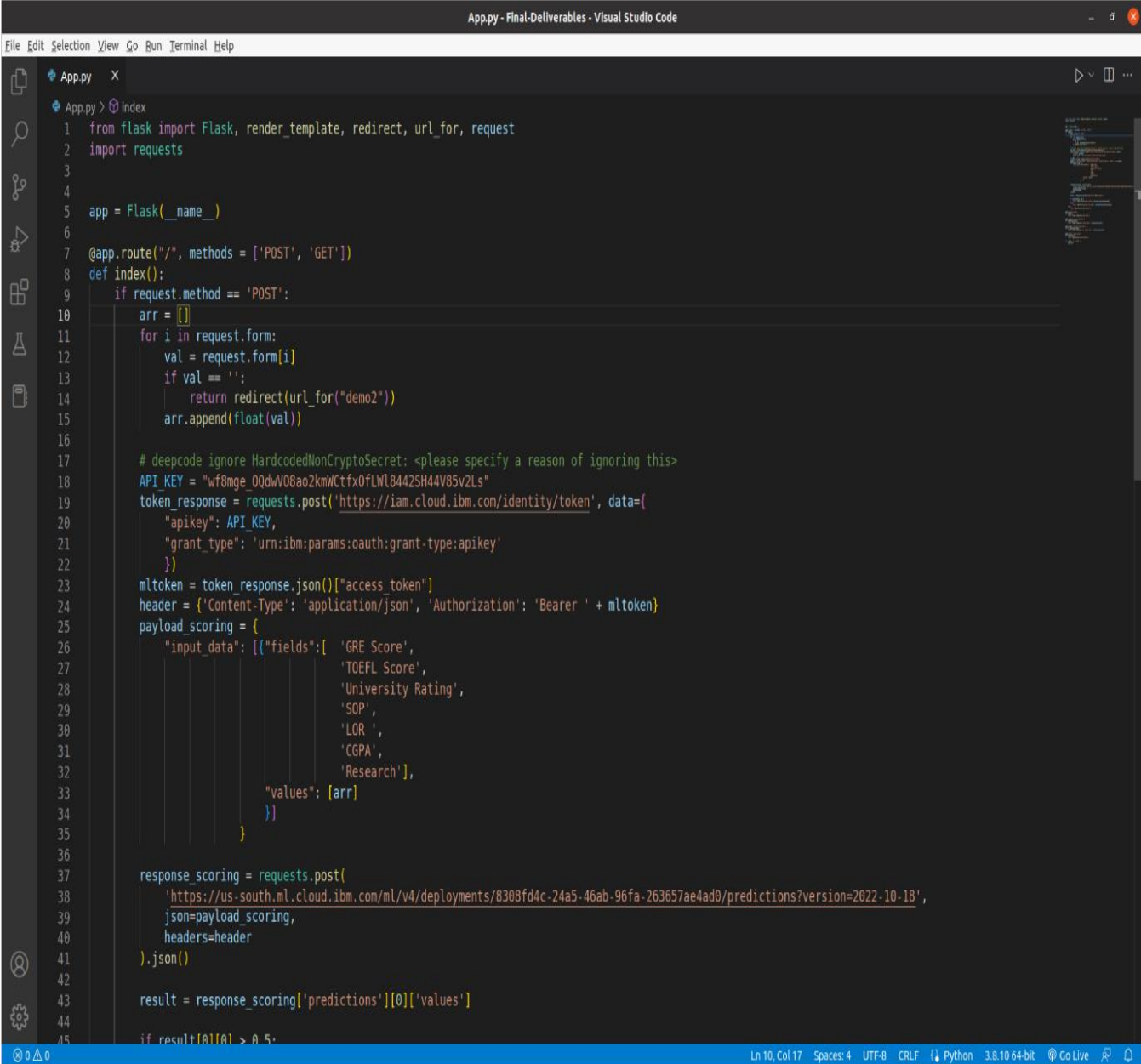
7. CODING & SOLUTIONING

7.1 Feature 1 - FLASK APP

The following is the flask app code and working

App.py

```python
from flask import Flask, render_template, redirect, url_for, request
import requests


app = Flask(__name__)

@app.route("/", methods = ['POST', 'GET'])
def index():
    if request.method == 'POST':
        arr = []
        for i in request.form:
            val = request.form[i]
            if val == '':
                return redirect(url_for("demo2"))
            arr.append(float(val))

        # deepcode ignore HardcodedNonCryptoSecret: <please specify a reason of ignoring this>
        API_KEY = "wf8mge_OQdwVO8ao2kmWCtfxOfLWl8442SH44V85v2Ls"
        token_response = requests.post('https://iam.cloud.ibm.com/identity/token', data={
            "apikey": API_KEY,
            "grant_type": 'urn:ibm:params:oauth:grant-type:apikey'
            })
        mltoken = token_response.json()["access_token"]
        header = {'Content-Type': 'application/json', 'Authorization': 'Bearer ' + mltoken}
        payload_scoring = {
            "input_data": [{"fields":[  'GRE Score',
                                        'TOEFL Score',
                                        'University Rating',
                                        'SOP',
                                        'LOR ',
                                        'CGPA',
                                        'Research'],
                        "values": [arr]
                        }]
                }

        response_scoring = requests.post(
            'https://us-south.ml.cloud.ibm.com/ml/v4/deployments/8308fd4c-24a5-46ab-96fa-263657ae4ad0/predictions?version=2022-10-18',
            json=payload_scoring,
            headers=header
        ).json()

        result = response_scoring['predictions'][0]['values']

        if result[0][0] > 0.5:
```

```python
                                   'LOR ',
                                   'CGPA',
                                   'Research'],
                           "values": [arr]
                       }]
               }

        response_scoring = requests.post(
            'https://us-south.ml.cloud.ibm.com/ml/v4/deployments/8308fd4c-24a5-46ab-96fa-263657ae4ad0/predictions?version=2022-10-18',
            json=payload_scoring,
            headers=header
        ).json()

        result = response_scoring['predictions'][0]['values']

        if result[0][0] > 0.5:
            return redirect(url_for('chance', percent=result[0][0]*100))
        else:
            return redirect(url_for('no_chance', percent=result[0][0]*100))
    else:
        return redirect(url_for("demo2"))

@app.route("/home")
def demo2():
    return render_template("home.html")

@app.route("/chance/<percent>")
def chance(percent):
    return render_template("chance.html", content=[percent])

@app.route("/nochance/<percent>")
def no_chance(percent):
    return render_template("no chance.html", content=[percent])

@app.route('/<path:path>')
def catch_all():
    return redirect(url_for("demo2"))

if __name__ == "__main__":
    app.run()
```
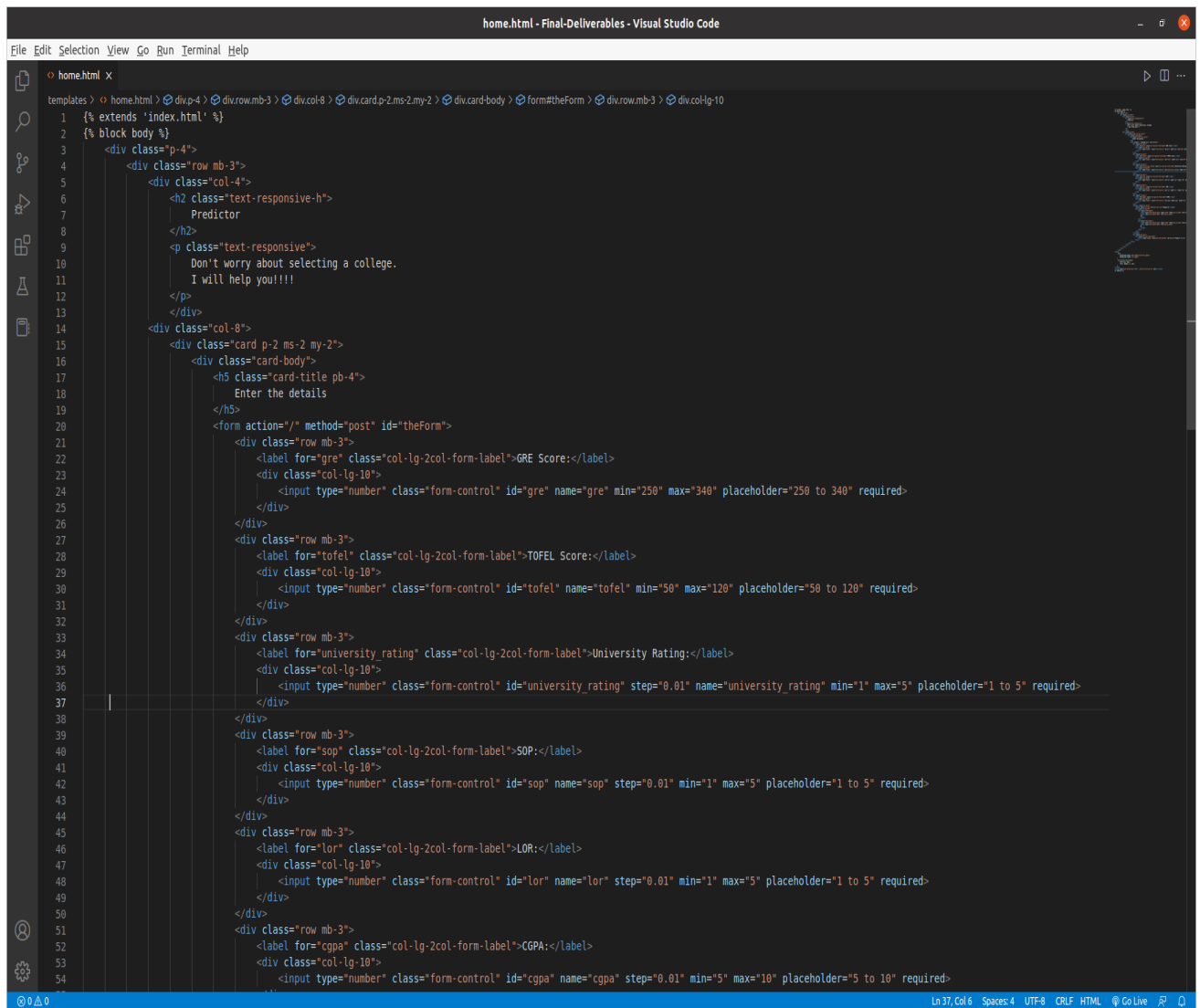
7.2 Feature 2 - UI

The following is the UI code for the application.

HTML

1.Home.html

File Edit Selection View Go Run Terminal Help

home.html ×

templates › ‹› home.html › ⬦ div.p-4 › ⬦ div.row.mb-3 › ⬦ div.col-8 › ⬦ div.card.p-2.ms-2.my-2 › ⬦ div.card-body › ⬦ form#theForm › ⬦ div.row.mb-3 › ⬦ div.col-lg-10

```html
43                        </div>
44                    </div>
45                    <div class="row mb-3">
46                        <label for="lor" class="col-lg-2col-form-label">LOR:</label>
47                        <div class="col-lg-10">
48                            <input type="number" class="form-control" id="lor" name="lor" step="0.01" min="1" max="5" placeholder="1 to 5" required>
49                        </div>
50                    </div>
51                    <div class="row mb-3">
52                        <label for="cgpa" class="col-lg-2col-form-label">CGPA:</label>
53                        <div class="col-lg-10">
54                            <input type="number" class="form-control" id="cgpa" name="cgpa" step="0.01" min="5" max="10" placeholder="5 to 10" required>
55                        </div>
56                    </div>
57                    <fieldset class="row mb-3">
58                        <legend class="col-form-labelcol-sm-2 pt-0">Research:</legend>
59                        <div class="col-sm-10">
60                            <div class="form-check">
61                                <input class="form-check-input" type="radio" name="yes_no_radio" id="gridRadios1" value="1">
62                                <label class="form-check-label" for="yes_no_radio">
63                                Yes
64                                </label>
65                            </div>
66                            <div class="form-check">
67                                <input class="form-check-input" type="radio" name="yes_no_radio" id="gridRadios2" value="0" checked>
68                                <label class="form-check-label" for="yes_no_radio">
69                                No
70                                </label>
71                            </div>
72                        </div>
73                    </fieldset>
74                    <div class="row lg-3">
75                        <div class="col-lg-2 mb-2 me-3">
76                            <button type="submit" class="btn btn-primary" id="button">Predict</button>
77                        </div>
78                    </form>
79                </div>
80            </div>
81        </div>
82    </div>
83 </div>
84 <style>
85    .p-4{
86        background-image: url("image/university.jpeg");
87        background-repeat: no-repeat;
88    }
89    .col-lg-2col-form-label{
90        font-size: 20px;
91        color: rgb(2, 4, 113);
92    }
93 </style>
94 <script type="text/javascript" src="../static/js/script.js" async></script>
95 {% endblock %}
96
```

⊗ 0 △ 0   Ln 37, Col 6   Spaces: 4   UTF-8   CRLF   HTML   ⏺ Go Live

2. Index.html

File Edit Selection View Go Run Terminal Help

◇ index.html ✕

templates ﹥ ◇ index.html ﹥ ⊘ html ﹥ ⊘ body ﹥ ⊘ script

```html
1   <!DOCTYPE html>
2   <html lang="en">
3   <head>
4       <meta charset="UTF-8">
5       <meta http-equiv="X-UA-Compatible" content="IE=edge">
6       <meta name="viewport" content="width=device-width, initial-scale=1.0">
7       <meta name="viewport" content="width=device-width, initial-scale=1, maximum-scale=1, user-scalable=no">
8       <link rel="stylesheet" type="text/css" rel="noopener" target="_blank" href="../static/css/styles.css">
9       <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/css/bootstrap.min.css"
10      rel="stylesheet" integrity="sha384-Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeu0xjzrPF/et3URy9Bv1WTRi" crossorigin="anonymous">
11      <title>University Admit Eligibility Predictor</title>
12  </head>
13  <body>
14      <nav class="navbar navbar-expand-lg bg-light">
15          <div class="container-fluid">
16              <a class="navbar-brand text-responsive-h" href="/">
17                  <img src="image/logo.png" alt="" width="30" height="24" class="d-inline-block align-text-top ">
18                  University Admission Eligibility Prediction System
19              </a>
20          </div>
21      </nav>
22      {% block body %}
23      <h1> Index Page </h1>
24      {% endblock %}
25      <script src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/js/bootstrap.bundle.min.js"
26      integrity="sha384-OERcA2EqjJCMA+/3y+gxIOqMEjwtxJY7qPCqsdltbNJua0e923+mo//f6V8Qbsw3" crossorigin="anonymous"></script>
27  </body>
28  </html>
29
```
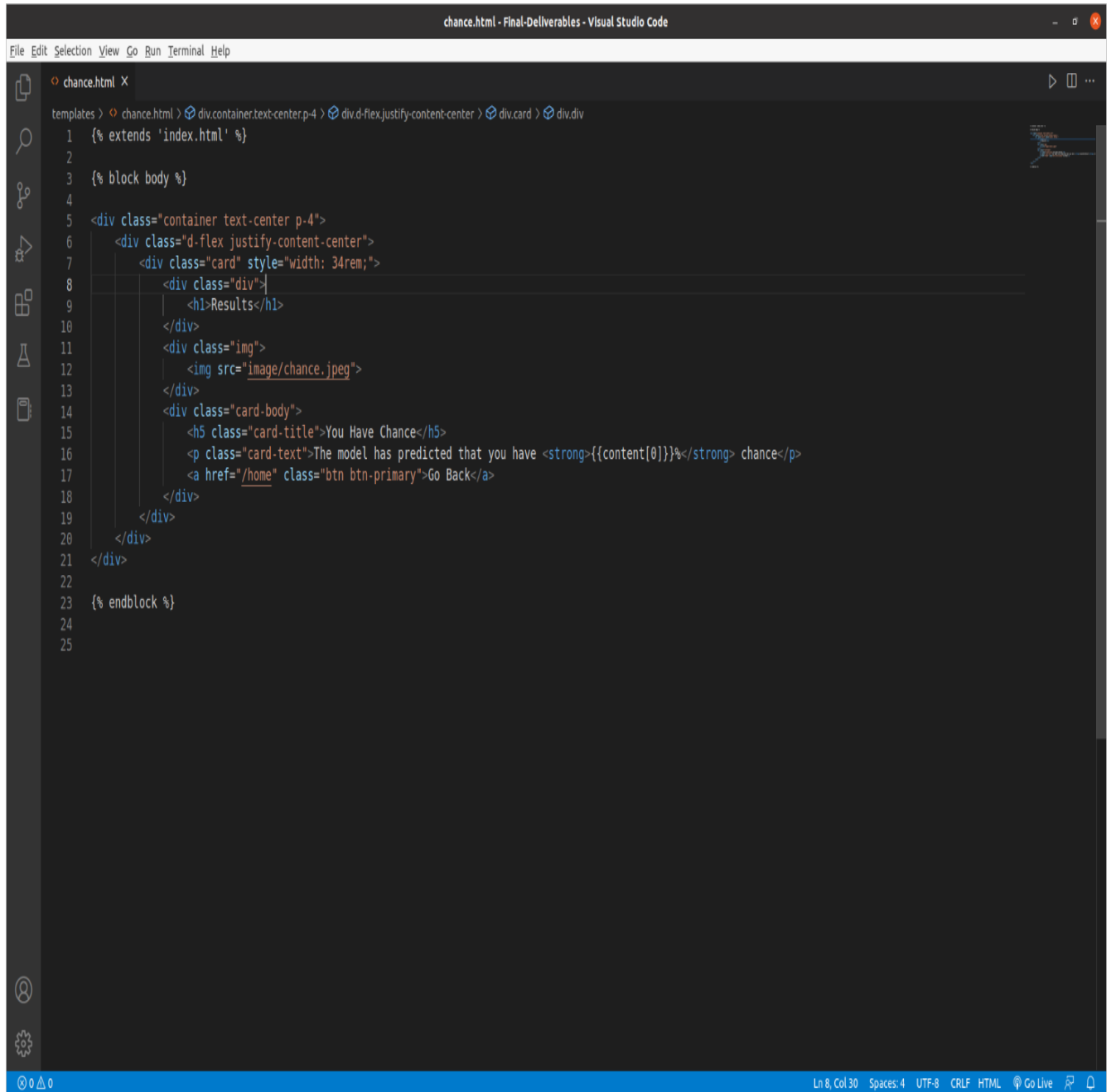
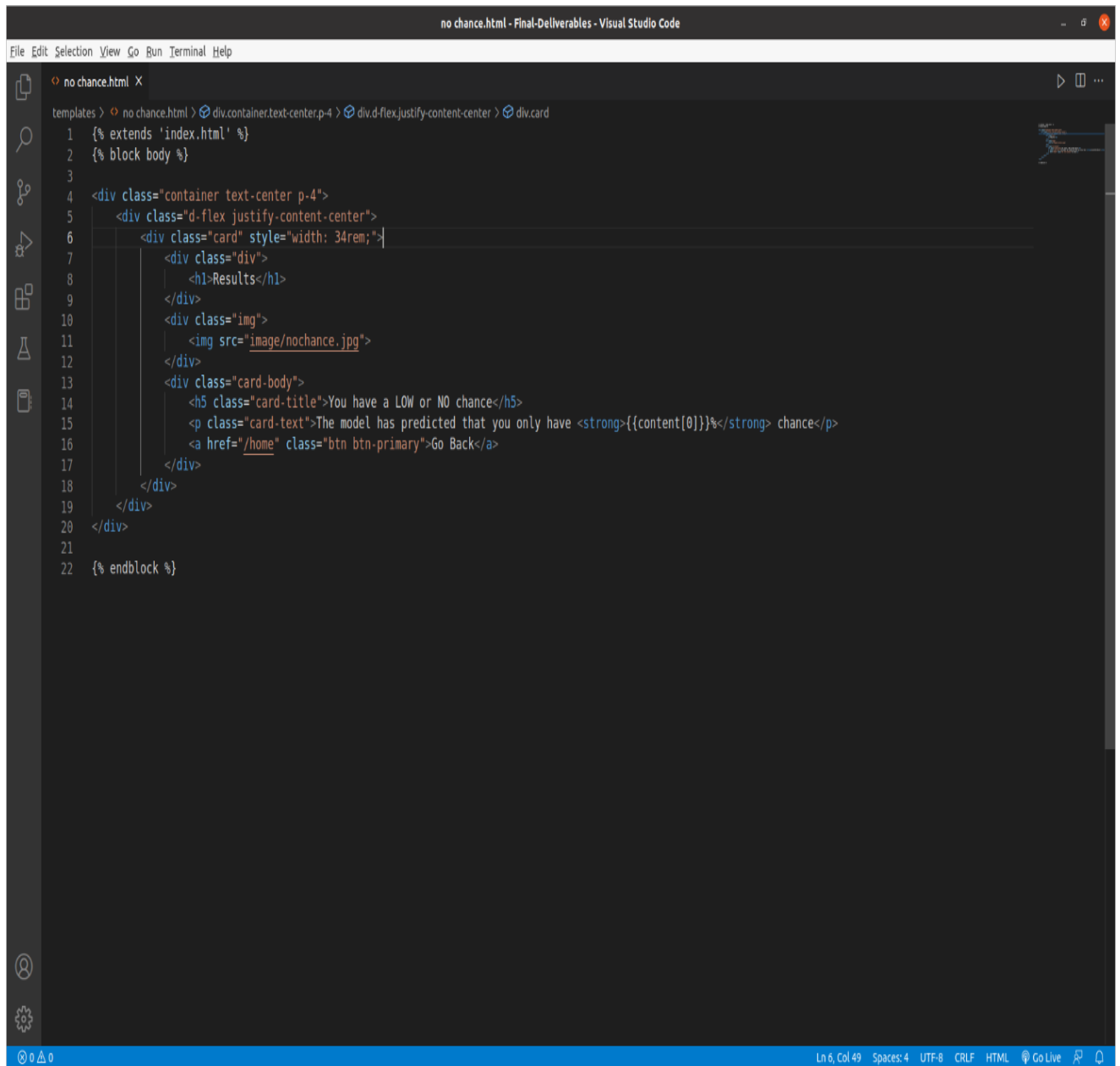Ln 26, Col 5   Spaces: 4   UTF-8   CRLF   HTML   Go Live

3.Chance.html

```html
{% extends 'index.html' %}

{% block body %}

<div class="container text-center p-4">
    <div class="d-flex justify-content-center">
        <div class="card" style="width: 34rem;">
            <div class="div">
                <h1>Results</h1>
            </div>
            <div class="img">
                <img src="image/chance.jpeg">
            </div>
            <div class="card-body">
                <h5 class="card-title">You Have Chance</h5>
                <p class="card-text">The model has predicted that you have <strong>{{content[0]}}%</strong> chance</p>
                <a href="/home" class="btn btn-primary">Go Back</a>
            </div>
        </div>
    </div>
</div>

{% endblock %}
```

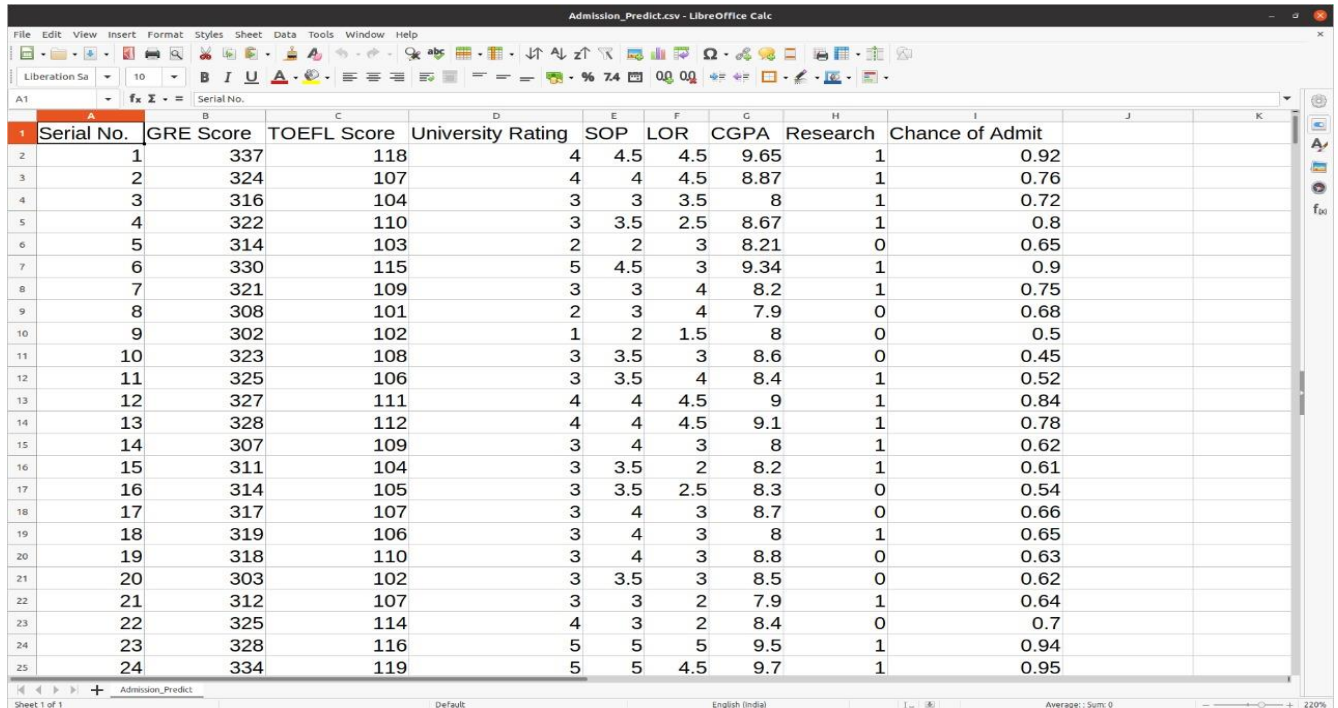# 4.NoChance.html

```
no chance.html - Final-Deliverables - Visual Studio Code

File  Edit  Selection  View  Go  Run  Terminal  Help

<> no chance.html  X

templates > <> no chance.html > ⊘ div.container.text-center.p-4 > ⊘ div.d-flex.justify-content-center > ⊘ div.card
  1   {% extends 'index.html' %}
  2   {% block body %}
  3
  4   <div class="container text-center p-4">
  5       <div class="d-flex justify-content-center">
  6           <div class="card" style="width: 34rem;">
  7               <div class="div">
  8                   <h1>Results</h1>
  9               </div>
 10               <div class="img">
 11                   <img src="image/nochance.jpg">
 12               </div>
 13               <div class="card-body">
 14                   <h5 class="card-title">You have a LOW or NO chance</h5>
 15                   <p class="card-text">The model has predicted that you only have <strong>{{content[0]}}%</strong> chance</p>
 16                   <a href="/home" class="btn btn-primary">Go Back</a>
 17               </div>
 18           </div>
 19       </div>
 20   </div>
 21
 22   {% endblock %}
```

8.TESTING

8.1Test Cases

8.2 User Acceptance Testing

User Acceptance Testing (UAT) is a type of testing performed by the end user or the client to verify/accept the software system before moving the software application to the production environment. UAT is done in the final phase of testing after functional, integration and system testing is done. The User Acceptance of this product is not surveyed enough to give a solid conclusion. The theretical and hypothetical acceptance is calculated to be high enough to conclude that this product is usable and valuable

9. RESULTS

9.1 Performance Metrics

The Performance is the Accuracy of the model trained.

The training accuracy of the model is 92%.

The testing accuracy of the model is 89%.

University Admission Eligibility Prediction System

Results

You Have Chance

The model has predicted that you have **77.20068177140593%** chance

Go Back

University Admission Eligibility Prediction System

Results

You have a LOW or NO chance

The model has predicted that you only have **41.70805116690457%** chance

Go Back

10. ADVANTAGES & DISADVANTAGES

➤ ADVANTAGE

1. Know the percentage
2. Lower investigation
3. Provide Relevant Material
4. Reduce time consumption

➤ DISADVANTAGE

1. Significant investments required
2. Enable to capture changes
3. Privacy concerns

11. CONCLUSION

We have successfully developed an application using python flask, HTML, CSS. By using the application we can predict weather we can get admission in the desired University or not.

12. FUTURE SCOPE

In fut re we would like to enhance the existing model in such a way that consumer feels the same way when purchasing in store using Virtual reality and other upcoming technologies. Research to improve the accuracy of the system is under progress.

13.APPENDIX

Source Code Link:

https://drive.google.com/drive/folders/1Ic-7ieMyl0PgV2ZcuV4a9kj6VKs3ZetN?usp=share_link

Github link:

https://github.com/IBM-EPBL/IBM-Project-28206-1660108862

Project Demo link:

https://drive.google.com/file/d/1f88Oetq1X4Tu22cLicDUN-KXUJWRVG9U/view?usp=drivesdk