UNIVERSITY ADMIT ELIGIBELITY PREDICTOR

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 to a particular university. This analysis should also help students who are preparing or will be preparing to get a better idea.

1.2 Purpose

A person's 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 to their dream university is one of their main concerns. It is seen that often students prefer to pursue their education at universities that 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. The majority of the world's highly reputed universities, a wide range of courses offered in every sector, a highly accredited education system and teaching, scholarships provided to students, the best job market, and many more advantages make it the dream destination for 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. (MasterPortal (2017))

2.1 Existing problem

Universities take into consideration different factors like scores on aptitude-based examinations like the General Record Examination (GRE), command over the English language is judged based on their score in English competency tests like the 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 References

1. Geiser, Saul, and Roger Studley. "UC and the SAT: Predictive validity and the differential impact of the SAT I and SAT II at the University of California." *Educational Assessment* 8.1 (2002): 1-26.

2. Rothstein, Jesse M. "College performance predictions and the SAT." *Journal of Econometrics* 121.1-2 (2004): 297-317.
3. Leonard, David K., and Jiming Jiang. "Gender bias and the college predictions of the SATs: A cry of despair." *Research in Higher education* 40.4 (1999): 375-407.

2.3 Problem Statement Definition

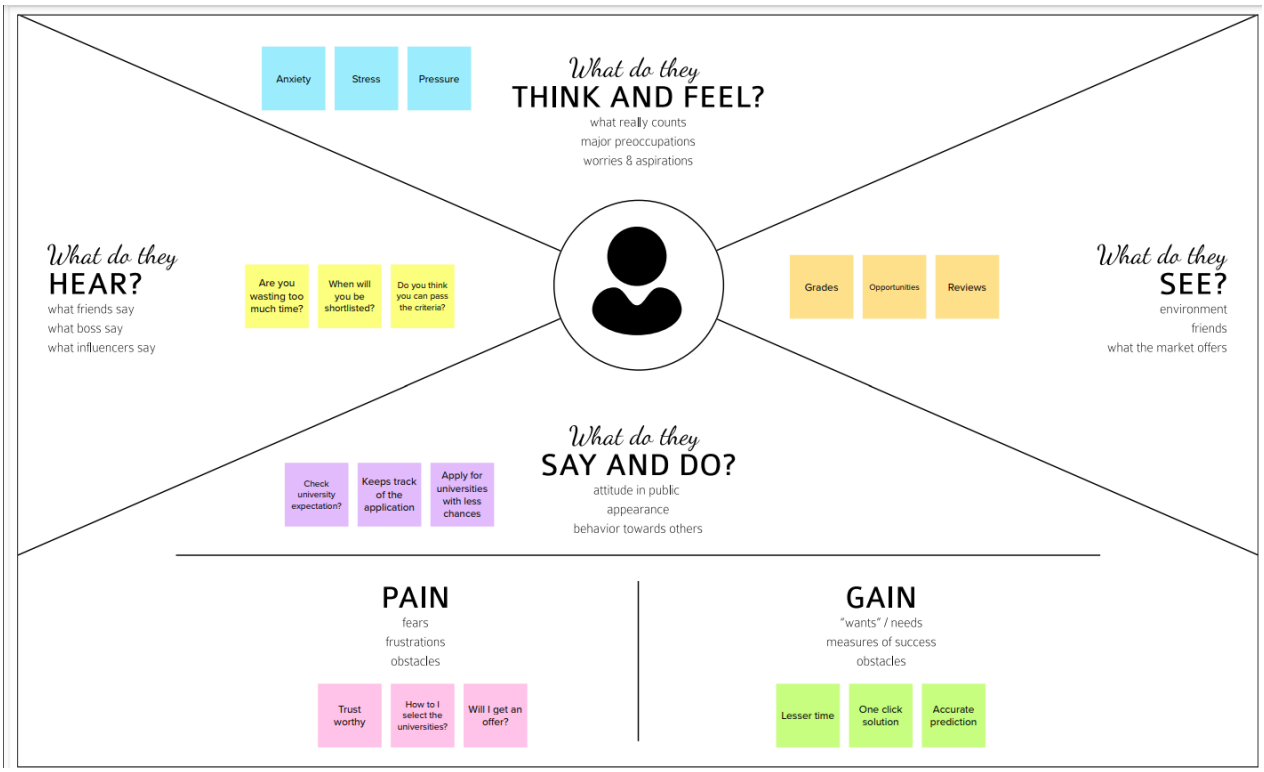
Build an application that predicts the university admission chances of a student-powered by machine learning models. Train the model and host it on the IBM cloud. The majority of international students studying in the USA are from India and China. In the past decade, India has seen a huge increase in 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 to highly ranked colleges, and also getting a job is a challenge as the ratio of the number of students to the number of 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 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 a Master in Computer Science field from universities in the USA is quite high; the focus of this research will be on these students.

3. IDEATION & PROPOSED SOLUTION

The project aims to develop an application that uses artificial intelligence with the help of a chatbot to customize products for the customers which enhances the fame of the eCommerce store and reduces the time customers spend 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 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 a high chance of admission is difficult mainly for international students, so they end up applying to many universities in hopes of getting admission to a 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 shortlisting the universities, but they are not reliable. Most of the students don't take the risk of evaluating the colleges by themselves, and they seek the help of 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 that will help the users to input the data related to the student profiles and get the predicted result for the application based on the profile as output. This research will thus eventually help students save the extra amount of time and money they have to spend at education consultancy firms. And also it will help them to limit their number of applications to a small number by proving them with 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

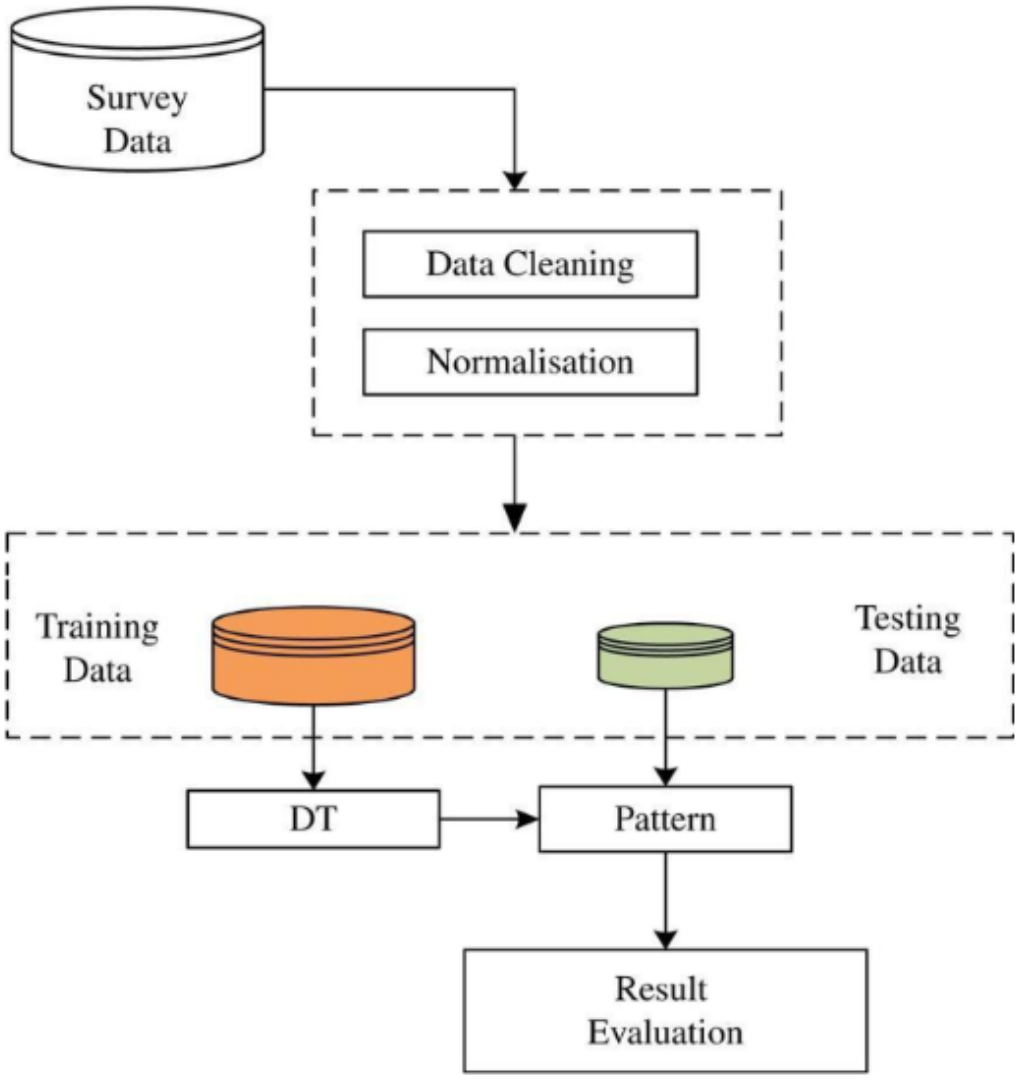
- prediction
- input form
- percentage of chance

4.2 Non-Functional requirements

- Speed
- Security
- Portability
- Compatibility
- Capacity
- Reliability
- Environment
- Localization

5. PROJECT DESIGN

5.1 Data Flow Diagrams

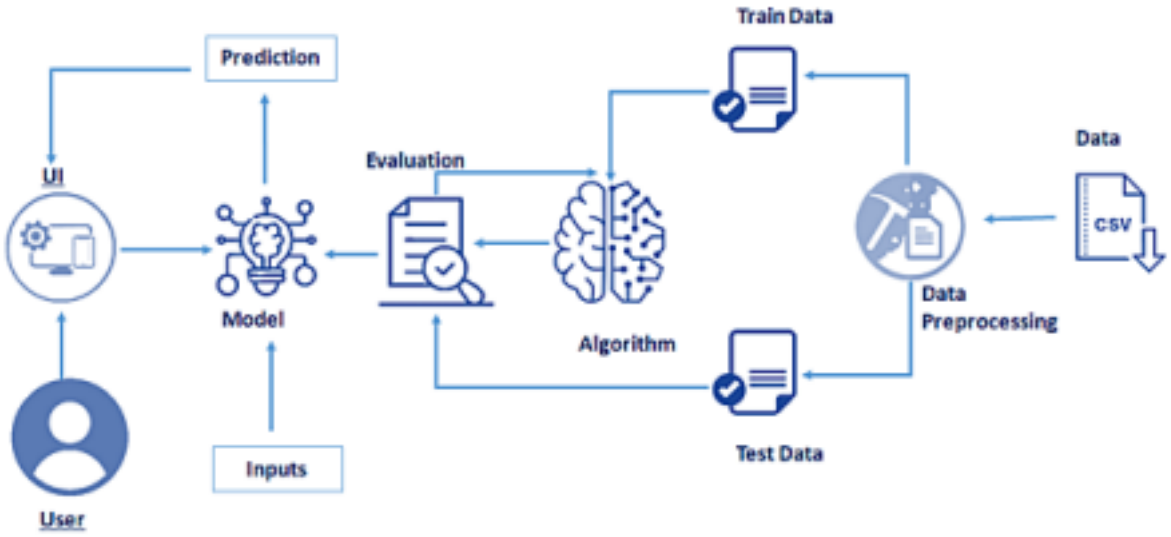


5.2 Solution & Technical Architecture

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 for the solution's definition, management, and delivery.



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 clients, users, managers, or development teams.

6. PROJECT PLANNING & SCHEDULING

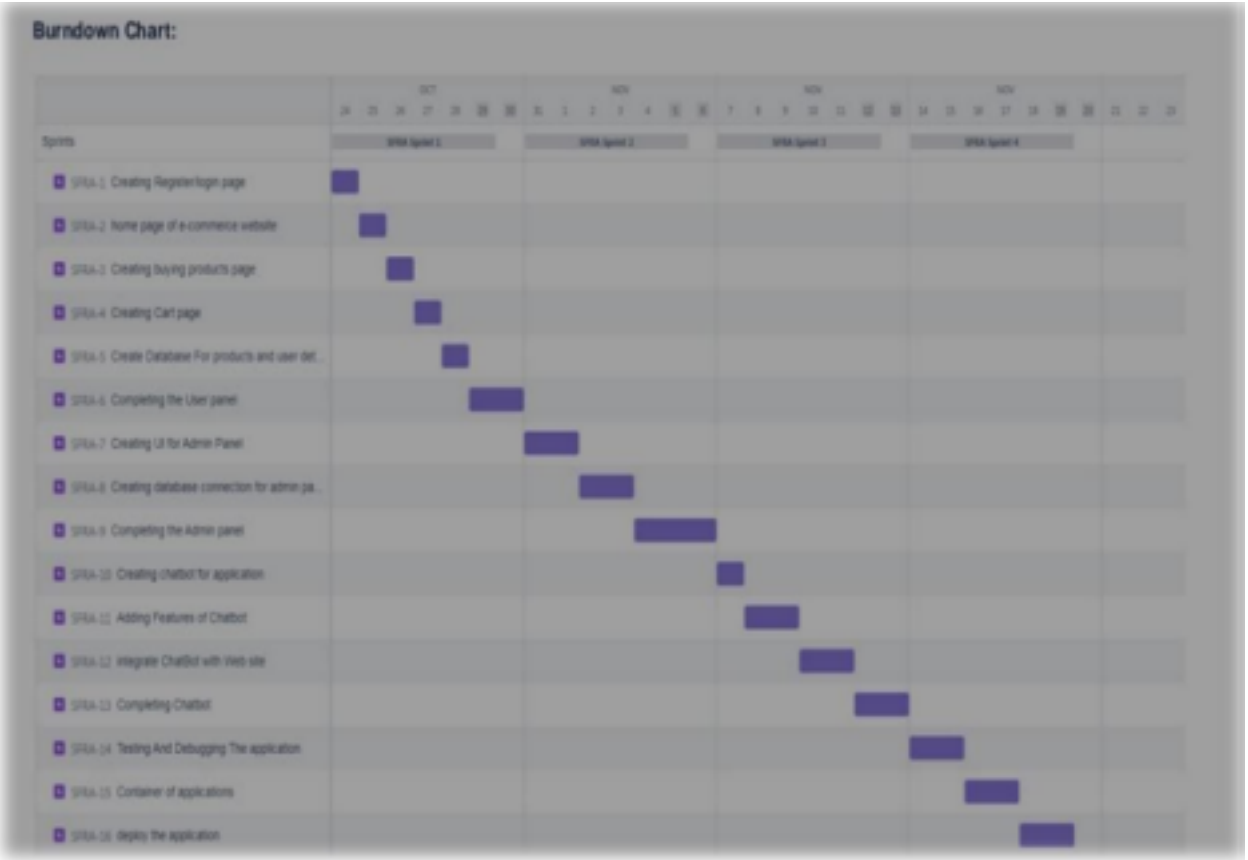
6.1 Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I will be able to register my application by entering my email, password, and confirming my password.	2	High	Raghavi V
Sprint-1		USN-2	As a user, I will be able to receive an email confirmation after registration.	1	High	Raghul P
Sprint-2		USN-3	As a user, I can register for the application through Gmail.	2	Low	Ashwin K
Sprint-1		USN-4	As a user, I can register for the application by entering details by self.	2	Medium	Pradeshwaran P
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	1	High	Raghavi V
	Dashboard					

6.2 Sprint 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	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	30 Oct 2022	02 Sept 2022	20	31 Oct 2022
Sprint-3	20	6 Days	01 Sept 2022	07 Sept 2022	20	05 Sept 2022
Sprint-4	20	6 Days	06 Sept 2022	15 Sept 2022	20	12 Sept 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

```
from flask import Flask
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"))
```

```
14 arr.append(float(val))
15
16 # deepcode ignore HardcodedNonCryptoSecret: <please specify a
   reason of ignoring this>
17 API_KEY = "wf8mge_OQdwVO8ao2kmWCtfxOfLWl8442SH44V85v2Ls" 18
token_response =
requests.post('https://iam.cloud.ibm.com/identity/token', data={ 19
"apikey": API_KEY,
20 "grant_type": 'urn:ibm:params:oauth:grant type:apikey'
21 })
22 mltoken = token_response.json()["access_token"] 23 header =
{'Content-Type': 'application/json', 'Authorization': 'Bearer ' +
mltoken}
24 payload_scoring = {
25 "input_data": [{"fields":[ 'GRE Score', 26 'TOEFL Score',
27 'University Rating', 28 'SOP',
   'LOR '
   'CGPA'
31 'Research'], 32 "values": [arr]
33 }]
34 }
35
36 response_scoring = requests.post(
37 'https://us
   south.ml.cloud.ibm.com/ml/v4/deployments/8308fd4c-24a5-46ab-96fa
   263657ae4ad0/predictions?version=2022-10-18',
38 json=payload_scoring,
39 headers=header
40 ).json()
41
42 result = response_scoring['predictions'][0]['values'] 43
44 if result[0][0] > 0.5:
45 return redirect(url_for('chance', percent=result[0][0]*100))
46 else:
47 return redirect(url_for('no_chance', percent=result[0][0]*100))
48 else:
49 return redirect(url_for("demo2"))
50
51 @app.route("/home")
```

```
52 def demo2():
53 return render_template("demo2.html")
54
55 @app.route("/chance/<percent>")
56 def chance(percent):
57 return render_template("chance.html", content=[percent]) 58
59 @app.route("/nochance/<percent>")
60 def no_chance(percent):
61 return render_template("noChance.html", content=[percent]) 62
63 @app.route('/<path:path>')
64 def catch_all():
    return                    "demo2"

67 if __name__ == "__main__":
```

7.2 Feature 2 - UI

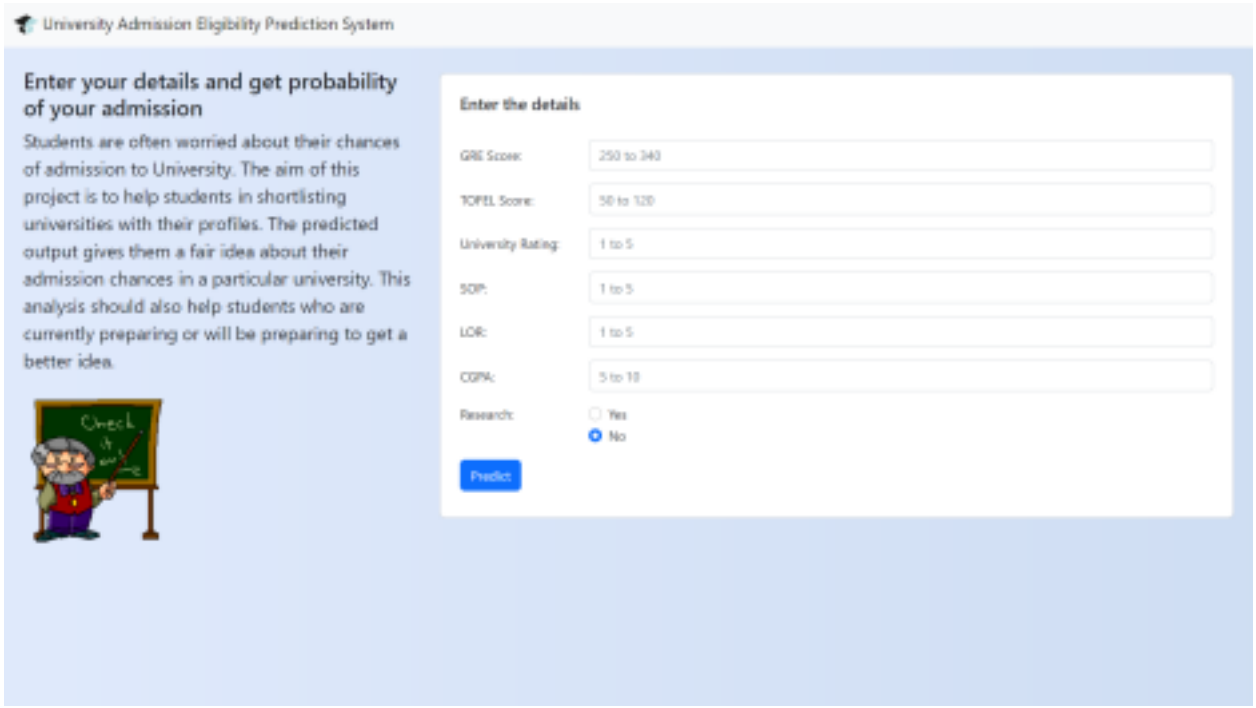
The following is the UI code for the application.

```
      extends 'index.html'
2 {% block body %}
3 <div class="p-4">
4 <div class="row mb-3">
5 <div class="col-4">
6 <h2 class="text-responsive-h">
7 Enter your details and get probability of your admission
8 </h2>
9 <p class="text-responsive">
10 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.
11 </p>
12 <div class="d-flex justify-content-right"> 13 <img
src="../static/img/animated-teach.gif" border="0" alt="..." />
14 </div>
15 </div>
16 <div class="col-8">
17 <div class="card p-2 ms-2 my-2">
18 <div class="card-body">
        class "card-title pb-4"
   Enter
21 </h5>
22 <form action="/" method="post" id="theForm">
23 <div class="row mb-3"> 24 <label for="gre" class="col-lg-2
col-form-label">GRE Score:</label>
25 <div class="col-lg-10"> 26 <input type="number"
class="form-control" id="gre" name="gre" min="250" max="340"
placeholder="250 to 340" required>
27 </div>
28 </div>
29 <div class="row mb-3"> 30 <label for="tofel" class="col-lg 2
col-form-label">TOFEL Score:</label>
31 <div class="col-lg-10"> 32 <input type="number"
class="form-control" id="tofel" name="tofel" min="50" max="120"
placeholder="50 to 120" required>
33 </div>
34 </div>
35 <div class="row mb-3"> 36 <label for="university_rating"
class="col-lg-2 col-form-label">University Rating:</label> 37 <div
class="col-lg-10"> 38 <input type="number" class="form-control"
id="university_rating" step="0.01" name="university_rating" min="1"
max="5" placeholder="1 to 5" required>
39 </div>
40 </div>
41 <div class="row mb-3"> 42 <label for="sop" class="col-lg-2
col-form-label">SOP:</label>
43 <div class="col-lg-10"> 44 <input type="number"
class="form-control" id="sop" name="sop" step="0.01" min="1" max="5"
placeholder="1 to 5" required>
```

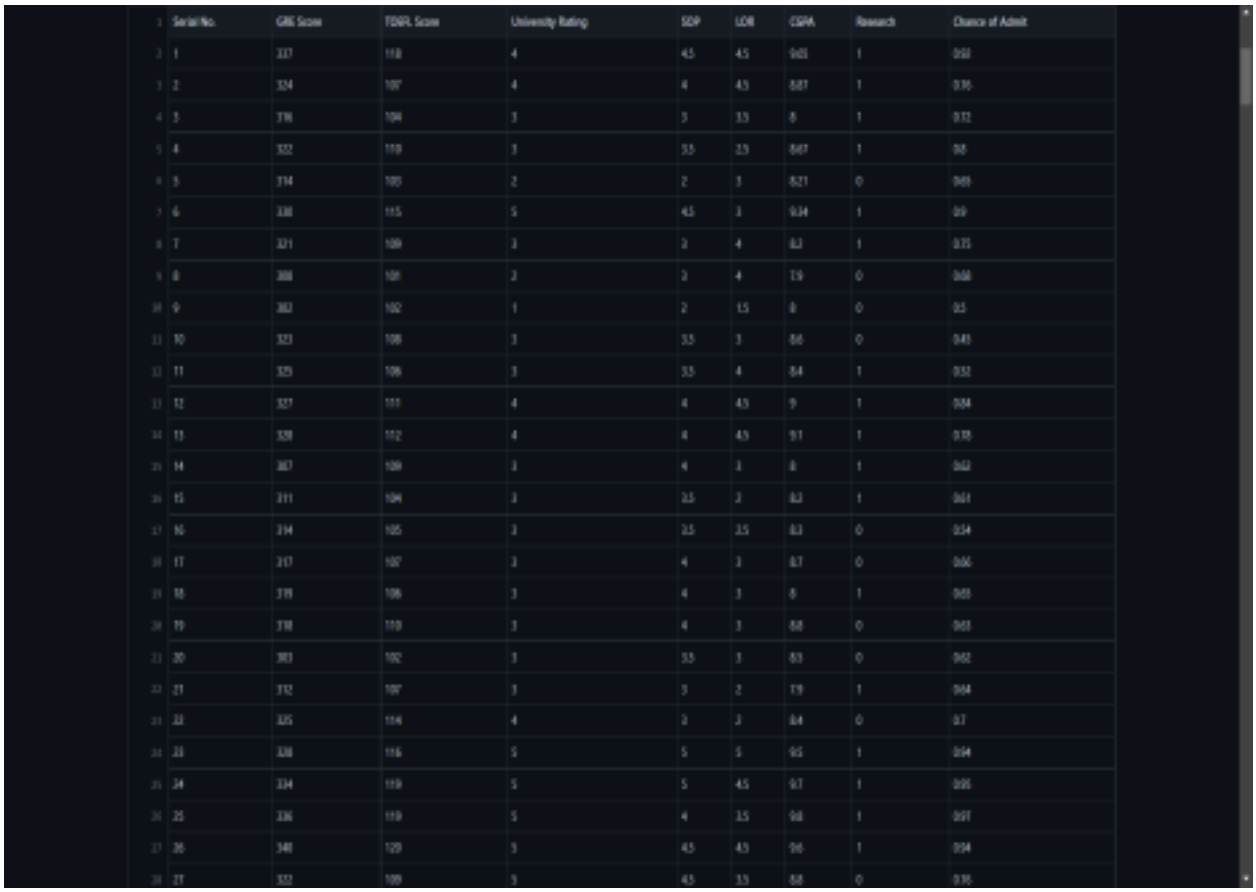
```
47 <div class="row mb-3"> 48 <label for="lor" class="col-lg-2
col-form-label">LOR:</label>
49 <div class="col-lg-10"> 50 <input type="number"
class="form-control" id="lor" name="lor" step="0.01" min="1" max="5"
placeholder="1 to 5" required>
51 </div>
52 </div>
53 <div class="row mb-3"> 54 <label for="cgpa" class="col-lg-2
col-form-label">CGPA:</label>
55 <div class="col-lg-10"> 56 <input type="number"
class="form-control" id="cgpa" name="cgpa" step="0.01" min="5"
max="10" placeholder="5 to 10" required>
57 </div>
58 </div>
59 <fieldset class="row mb-3"> 60 <legend class="col-form-label
col-sm-2 pt-0">Research:</legend>
61 <div class="col-sm-10"> 62 <div class="form-check"> 63 <input
class="form-check
   input" type="radio" name="yes_no_radio" id="gridRadios1"
   value="1">
64 <label class="form-check label" for="yes_no_radio">
65 Yes
66 </label>
67 </div>
68 <div class="form-check"> 69 <input class="form-check input"
type="radio" name="yes_no_radio" id="gridRadios2" value="0" checked>
70 <label class="form-check label" for="yes_no_radio">
71 No


74 </div>
75 </fieldset>
76 <div class="row lg-3"> 77 <div class="col-lg-2 mb-2 me-3"> 78
<button type="submit"
   class="btn btn-primary" id="button">Predict</button>
79 </div>
80 <div class="col-lg-2" id="spinner">
```

```
81 <div class="spinner-border text-primary m-1" role="status">
82 <span class="visually hidden">Loading...</span>
83 </div>
84 <div class="spinner-grow text-primary m-1" role="status">
85 <span class="visually hidden">Loading...</span>
86 </div>
87 </div>
88 </form>
89 </div>
90 </div>
91 </div>
92 </div>
93 </div>
94 <script type="text/javascript" src="../static/js/script.js"
   async></script>
95 {% endblock %}
96
97 {% extends 'index.html' %}
98
99 {% block body %}
100
101 <div class="container text-center p-4">
102 <div class="d-flex justify-content-center">
103
104 <div class="card" style="width: 34rem;"> 105 <img
src="..\static\img\chance.png" class="card-img-
   top" alt="...">
106 <div class="card-body">
107 <h5 class="card-title">You Have Chance</h5> 108 <p
class="card-text">The model has predicted that you have
<strong>{{content[0]}}%</strong> chance</p> 109 <a href="/home"
class="btn btn-primary">Go Back</a>
110 </div>
111 </div>
112 </div>
113 </div>
114
```



8. TESTING

8.1 Test Cases



Serial No.	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research	Chance of Admit
1	337	118	4	4.5	4.5	9.65	1	0.92
2	324	107	4	4	4.5	8.87	1	0.76
3	316	104	3	3	3.5	8	1	0.72
4	322	110	3	3.5	2.5	8.67	1	0.8
5	314	103	2	2	3	8.21	0	0.65
6	330	115	5	4.5	3	9.34	1	0.9
7	321	109	3	3	4	8.2	1	0.75
8	308	101	2	3	4	7.9	0	0.68
9	302	102	1	2	1.5	8	0	0.5
10	323	108	3	3.5	3	8.6	0	0.45
11	325	106	3	3.5	4	8.4	1	0.52
12	327	111	4	4	4.5	9	1	0.84
13	328	112	4	4	4.5	9.1	1	0.78
14	307	109	3	4	3	8	1	0.62
15	311	104	3	3.5	3	8.2	1	0.61
16	314	105	3	3.5	2.5	8.3	0	0.54
17	317	107	3	4	3	8.7	0	0.66
18	319	106	3	4	3	8	1	0.65
19	318	110	3	4	3	8.8	0	0.63
20	303	102	3	3.5	3	8.3	0	0.62
21	312	107	3	3	2	7.9	1	0.64
22	325	114	4	3	3	8.4	0	0.7
23	328	116	5	5	5	9.5	1	0.94
24	334	119	5	5	4.5	9.7	1	0.95
25	336	119	5	4	3.5	9.8	1	0.97
26	340	120	5	4.5	4.5	9.6	1	0.94
27	322	109	5	4.5	3.5	8.8	0	0.76

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%.

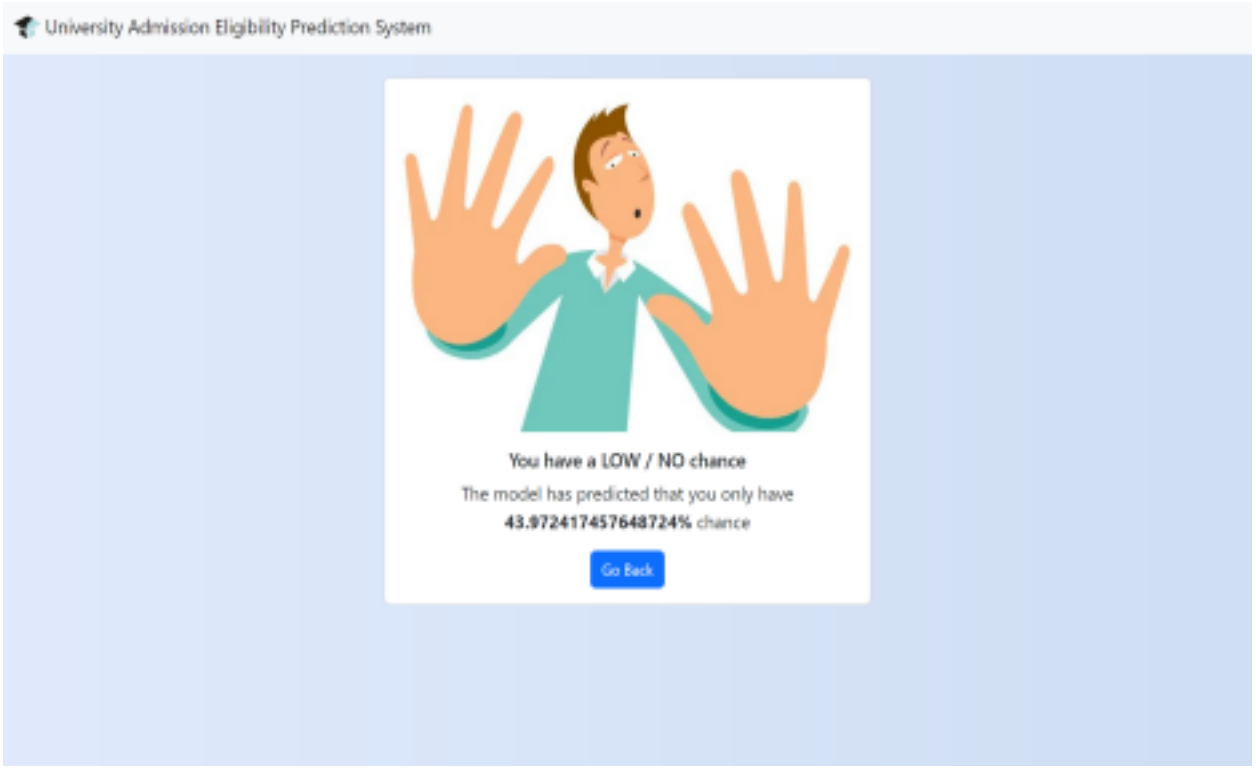
University Admission Eligibility Prediction System

You Have Chance

The model has predicted that you have

71.068875944459% chance

Go Back



10. ADVANTAGES & DISADVANTAGES

➢ ADVANTAGE

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

➢ 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, and and CSS. By using the application we can predict weather we can get adimition in the desired University or not.

12. FUTURE SCOPE

In the future 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. Reaserch to improve the accuracy of the system is under progress.

13. APPENDIX Source Code GitHub

GitHub: https://github.com/IBM-EPBL/IBM-Project-17621-1659674086

Demo: