University Admit Eligibility Predictor

TEAM ID	PNT2022TMID07254
MEMBERS	KAVYA VIJAYAKUMAR ALWIN AJAY J SURYA PRAKASH G KOWSALYA R

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 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 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 world's 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. (MasterPortal (2017))

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 References

1. Geiser, Saul, and Roger Studley. "UC and the SAT: Predictive validity and 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 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. IDEATION & PROPOSED SOLUTION

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 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 the international students are facing while applying for universities in the USA.

3.1 Empathy Map Canvas
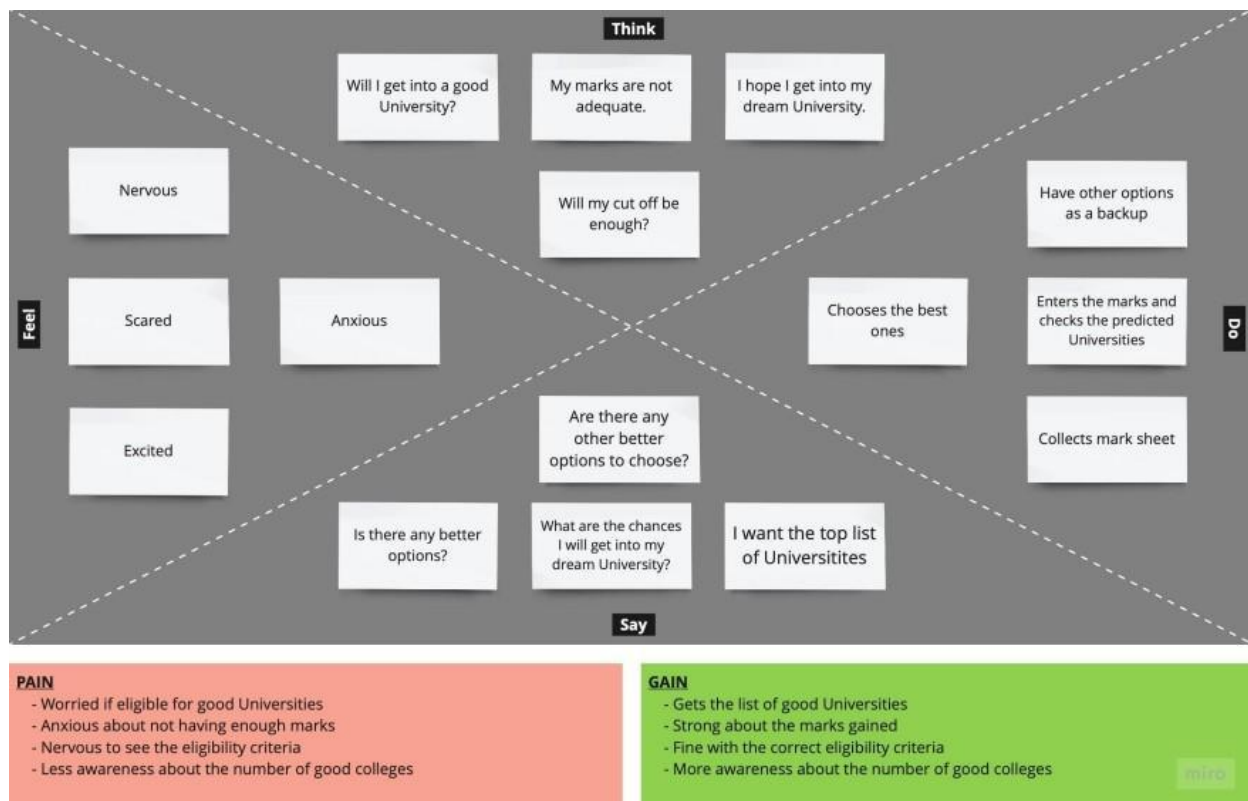
3.2 Ideation & Brainstorming

This task of shortlisting the universities where the student has high chances of admission is difficult for mainly 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 don't 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 the student profile 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 the education consultancy firms. And also it will help them to limit their number of applications 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

- 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

Algorithm
(Logistic Regression)

.CSV

Student Mark
Dataset

Test Data

Train Data

Data Preprocessing

Trained
Model

Evaluation

Predicting the chances of
Admission

Admission Granted

Admission Declined

Student Profile
Details

UI
(ML Based)

Student
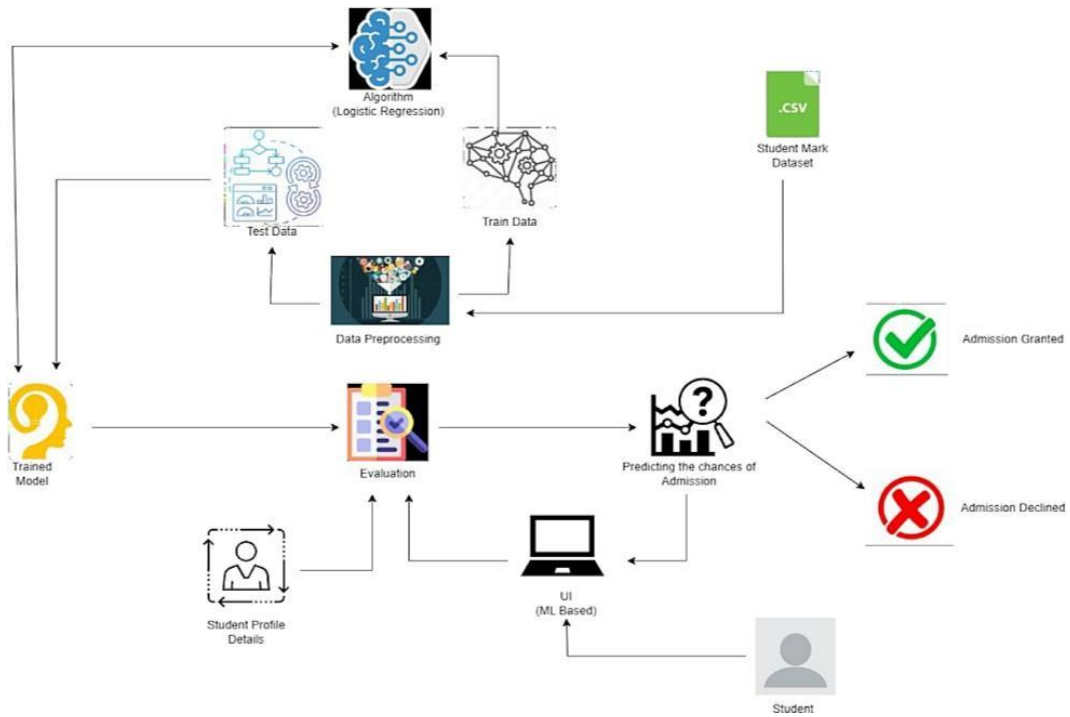
5.2 Solution & Technical Architecture

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.
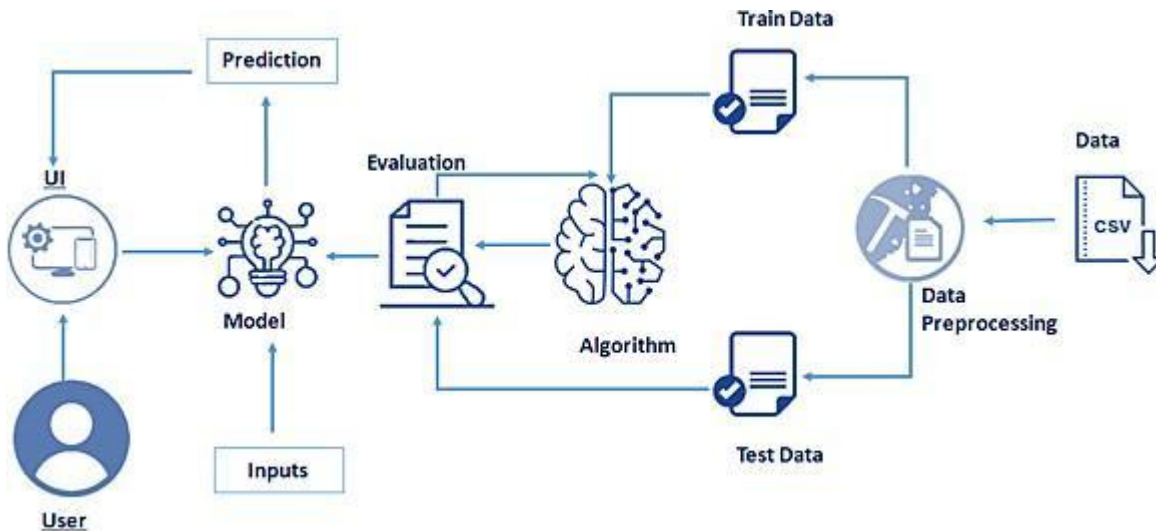
5.3 User Stories

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.

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	Karthikeyan S
Sprint-1		USN-2	As a user, I will be able to receive an email confirmation after registration.	1	High	Gowtham D
Sprint-2		USN-3	As a user, I can register for the application through Gmail.	2	Low	Mahesh J
Sprint-1		USN-4	As a user, I can register for the application by entering details by self.	2	Medium	Gokul Kanna
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	1	High	Ganeshan
	Dashboard					

6.2 Sprint Delivery Schedule
Project Tracker, Velocity & Burndown Chart: (4 Marks)

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

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)

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

6.3 Reports from JIRA

Burndown Chart:

	OCT							NOV							NOV							NOV						
	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Sprints	SFRA Sprint 1							SFRA Sprint 2							SFRA Sprint 3							SFRA Sprint 4						
SFRA-1 Creating Register/login page																											
SFRA-2 home page of e-commerce website																											
SFRA-3 Creating buying products page																											
SFRA-4 Creating Cart page																											
SFRA-5 Create Database For products and user det...																											
SFRA-6 Completing the User panel																											
SFRA-7 Creating UI for Admin Panel																											
SFRA-8 Creating database connection for admin pa...																											
SFRA-9 Completing the Admin panel																											
SFRA-10 Creating chatbot for application																											
SFRA-11 Adding Features of Chatbot																											
SFRA-12 integrate ChatBot with Web site																											
SFRA-13 Completing Chatbot																											
SFRA-14 Testing And Debugging The application																											
SFRA-15 Container of applications																											
SFRA-16 deploy the application																											

BURNDOWN CHART

7. CODING & SOLUTIONING

7.1 Feature 1 - FLASK APP

The following is the flask app code and working

```
1   from flask import Flask, render_template, redirect, url_for,
    request
2      import
requests 3
4 app = Flask(__name__)
5
6 @app.route("/", methods = ['POST', 'GET'])
7 def index():
8      if request.method == 'POST':
9          arr = []
10         for i in request.form:
11             val = request.form[i]
12             if val == '':
13                 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}
```

```python
                                                   '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() 41
        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")) 50
@app.route("/home")
def demo2():
    return  render_template("demo2.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("noChance.html",  content=[percent])

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

```
if                      "__main__"
```

7.2 Feature 2 - UI

The following is the UI code for the application.

```html
1  {% 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">
19                         <h5 class="card-title pb-4">
```

```html
20                              Enter the details
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>
45                             </div>
```

```html
46                              </div>
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
72                                      </label>
```

```html
                                             </div>
                                        </div>
                                   </fieldset>
                               <div class="row lg-3">
                                   <div class="col-lg-2 mb-2 me-3">
                                        <button type="submit"
class="btn btn-primary" id="button">Predict</button>
                                   </div>
                                        <div class="col-lg-2"
id="spinner">
                                        <div class="spinner-border
text-primary m-1" role="status">
                                             <span class="visually-
hidden">Loading...</span>
                                        </div>
                                         <div class="spinner-grow
text-primary m-1" role="status">
                                             <span class="visually-
hidden">Loading...</span>
                                        </div>
                                   </div>
                             </form>
                        </div>
                   </div>
              </div>
         </div>
<script    type="text/javascript"    src="../static/js/script.js"
async></script>
    {% 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
          <div class="card" style="width: 34rem;">
105            <img src="..\static\img\chance.png" class="card-img-
```

```
top"        "..."
    class "card-body"
       class "card-title" You Have Chance
     class "card-text" The

          "/home" class "btn btn-primary" Go Back
```

```
115 {% endblock
```

```
24    payload_scoring =      {
25    "input_data":          [{"fields":[  'GRE Score',
26                                         'TOEFL Score',
27                                         'University Rating',
28                                         'SOP',
29                                         'LOR ',
```

8. TESTING

8.1 Test Cases

	Serial No.	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research	Chance of Admit
1									
2	1	337	118	4	4.5	4.5	9.65	1	0.92
3	2	324	107	4	4	4.5	8.87	1	0.76
4	3	316	104	3	3	3.5	8	1	0.72
5	4	322	110	3	3.5	2.5	8.67	1	0.8
6	5	314	103	2	2	3	8.21	0	0.65
7	6	330	115	5	4.5	3	9.34	1	0.9
8	7	321	109	3	3	4	8.2	1	0.75
9	8	308	101	2	3	4	7.9	0	0.68
10	9	302	102	1	2	1.5	8	0	0.5
11	10	323	108	3	3.5	3	8.6	0	0.45
12	11	325	106	3	3.5	4	8.4	1	0.52
13	12	327	111	4	4	4.5	9	1	0.84
14	13	328	112	4	4	4.5	9.1	1	0.78
15	14	307	109	3	4	3	8	1	0.62
16	15	311	104	3	3.5	2	8.2	1	0.61
17	16	314	105	3	3.5	2.5	8.3	0	0.54
18	17	317	107	3	4	3	8.7	0	0.66
19	18	319	106	3	4	3	8	1	0.65
20	19	318	110	3	4	3	8.8	0	0.63
21	20	303	102	3	3.5	3	8.5	0	0.62
22	21	312	107	3	3	2	7.9	1	0.64
23	22	325	114	4	3	2	8.4	0	0.7
24	23	328	116	5	5	5	9.5	1	0.94
25	24	334	119	5	5	4.5	9.7	1	0.95
26	25	336	119	5	4	3.5	9.8	1	0.97
27	26	340	120	5	4.5	4.5	9.6	1	0.94
28	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 theoretical and hypothetical acceptance is calculated to be high enough to conclude that this product is usable and valuable
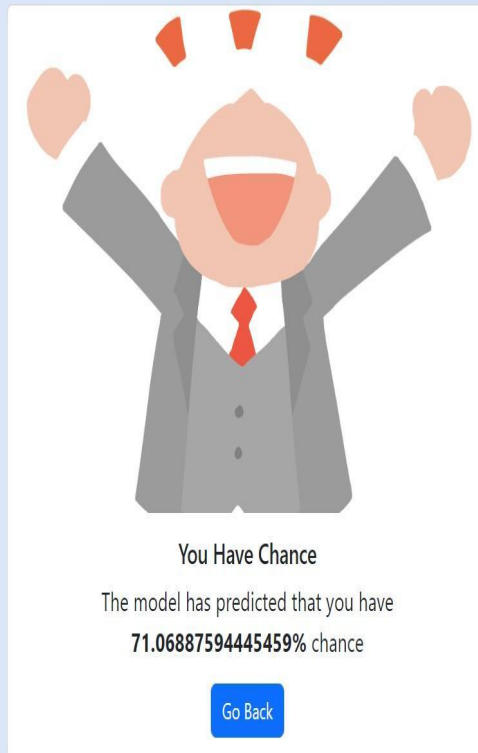
9. RESULTS
9.1 Performance Metrics

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%.

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. Significiant investments required
> 2. Unable to capture changes
> 3. Privacy concerns

11. CONCLUSION

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

12. FUTURE SCOPE

In 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.Research to improve the accuracy of the system is under progress.

13. APPENDIX Source Code GitHub & Project Demo Link
Project Link: http://ibmsmart.pythonanywhere.com/home
github:https://github.com/IBM-EPBL/IBM-Project-29387-1660124996
Demo: