

PROJECT REPORT

Team ID	TEAM ID - PNT2022TMID12111
ProjectName	UNIVERSITY ADMIT ELIGIBILITY PREDICTOR

1. INTRODUCTION**1.1 Project Overview:**

We are currently students aiming for future studies, and we wanted to know the odds of getting admission in a university according to our scores before applying. It takes input from the user, namely, their GRE score, TOFEL score, current CGPA, SOP, LOP, and university rating and it outputs the result according to the trained Machine Learning model. In this hands-on guided project, we will train regression models to find the probability of a student getting accepted into a particular university based on their profile. This project could be practically used to get the university acceptance rate for individual students using web application and to understand regression and classification problems

- To grab insights from data through visualization.
- Applying different ML algorithms to determine the probability of acceptance in a particular university.
- Evaluation metrics
- Build a web application using the Flask framework.

1.2 Purpose:

- 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 currently preparing or will be preparing to get a better idea.

2.LITERATURE SURVEY:

2.1 Existing problem:

In today's world many students are often worried about their chances of admission to university. The main moto of the project is help students to short listing universities with their marks. 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.

Given certain metrics of a student, our task is to predict the probability of the student getting accepted into graduate programs. Statistically, we have seen many students pursue their education away from their native countries. Generally, as the students don't have much of an idea about the procedures, requirements, and details of the universities, they seek help from education consultancy firms to help them successfully secure admission to the universities which are best suitable for their profiles. For this, they have to invest huge amounts of money in consultancy fees. The aim of this research is to develop a system using Applied Data Science.

University prediction would be the easiest mode to predict the university/college person is applicable for as well as it would be unbiased and totally transparent. Individually would no more need to depend upon the consultancies who may be slightly deviated from the list of colleges/universities that may be having contracts with them. Moreover, applying to only colleges/universities where the student has a genuine chance would reduce the application process. Additionally, living expense of the area where colleges/university is located would also be provided on the website.

2.2 References:

PAPER 1

TITLE:PREDICTION FOR UNIVERSITY ADMISSION USING MACHINE LEARNING

AUTHOR NAME: Chithara Apoorva D A

DESCRIPTION:Students who want to do masters in America have to write GRE and TOEFL/IELTS. Once they have attended the exams, they have to prepare their SOP and LOR which are one of the crucial factors they have to consider. These LOR and SOP play a vital role if the student was looking for any scholarship.

ADVANTAGES:

- Give more accurate options for foreign universities.
- Train more quickly, especially with bigger datasets.

DISADVANTAGES:

- Models, particularly those trained on CPUs, may be computationally costly and time-consuming.

PAPER 2

TITLE: GRADE MACHINE LEARNING SUPPOURT FOR GRADUATE ADMISSIONS

AUTHOR NAME:Austin Waters

DESCRIPTION:Waters and Mikkulainen proposed an astounding that asides in posting affirmation application as per the degree of acknowledgement and upgrades the presentation of inspecting applications utilizing measurable AI.

ADVANTAGES:

- GRADE has minimal software and hardware dependencies.
- It is implemented in Python with the Pandas and Skit-learn packages, which are open source and freely available.

DISADVANTAGES:

- It is used to display the result as a dotted graph.
- It is to predict the approximate value.

PAPER 3**TITLE:**PREDICTING UNDERGRADUATE ADMISSION**AUTHOR NAME:**Md. Portiku Zaman

DESCRIPTION:Here, the authors apply three machine learning algorithms XGBoost, lightGBM, and GBM on a collected dataset to estimate the probability of getting admission to the university after attending or before attending the admission test.

ADVANTAGES:

- Easy to implement evaluation of the conditional probability is simple.
- Individuals would no longer need to rely on consultancies that may have contracts with schools and universities that are somewhat off the list.

DISADVANTAGES :

- It is not always true that the conditional independence assumption is true. The feature often exhibits some sort of dependence.

PAPER 4**TITLE:**GRATUATE ADMISSION PREDICTION USING MACHINE

LEARNING

AUTHOR NAME:Sara Aljasami

DESCRIPTION:This will assist students to know in advance if they have a chance to get accepted. The machine learning models are multiple linear regression, K-nearest neighbour, random forest, and multilayer perceptron.

ADVANTAGES :

- It uses many algorithms like random forest, K-nearest neighbour, multilayer preceptron.
- The simplest way to determine whether a person is eligible for a university or college as well as being completely objective and transparent.

DISADVANTAGES :

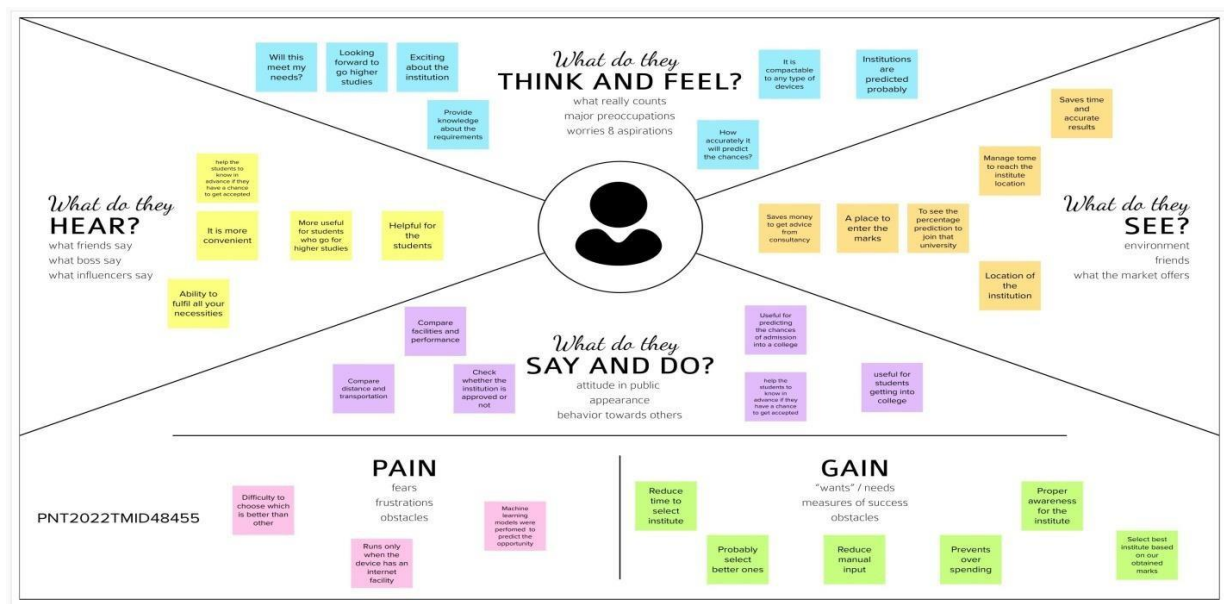
- Contrarily, linear regression presumes that the relationship between the dependent and independent variables is linear. The implies that it considers their relationship to be linear. The independence of the qualities is assumed.

2.3 Problem Statement Definition

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A student	Choose a good university	I am unaware about cutoff	I can't find people to guide me	Dejected
PS-2	A student	Enrol in a master degree	I am unaware about visa formalities	I can't find trusted websites	Frustrated
PS-3	A student	Enrol in a master	I am unaware about	I can't find helping	Depressed
		degree	scholarship opportunities	organisations	
PS -4	A student	Choose good university with well infrastructure	I am unaware about infrastructure and placement	I can't find people to guide me	Anxious

3.IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



3.2 Ideation & Brainstorming

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

Ⓢ 10 minutes

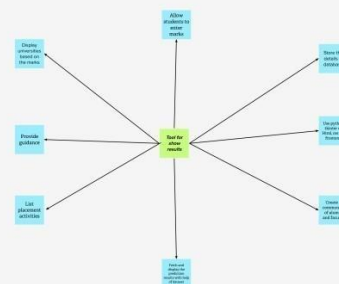


3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

20 minutes



3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	To predict the universities for the students to who is going to higher studies.
2.	Idea / Solution description	It will help the students to get admission for under graduate degrees from the top universities and well infrastructure laboratories. This analysis is helpful who is unaware of choosing UG degrees after secondary education. It will predict the students admission to the respected universities based on their secondary education marks.
3.	Novelty / Uniqueness	This website has to predict the universities inside India. And also give various information about the universities. Also to list the universities in the ranking list.
4.	Social Impact / Customer Satisfaction	The website will reduce the panic and unawareness among students. It will reduce our time, travel, and costs. It will give the exact approximate prediction based on students secondary education marks.
5.	Business Model (Revenue Model)	Universities shall find the websites in order to maintain it. This website will predict and display the exact results to the students.
6.	Scalability of the Solution	A future update shall have chat space comprising faculty, current students

3.4 Problem Solution fit

PROJECT DESIGN PHASE-1 – SOLUTION FIT			TEAM ID : PNT2022TMID48455		
Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS	6. CUSTOMER CC	5. AVAILABLE SOLUTIONS AS		
	Eligible Customer means either an eligible low-income customer or an eligible senior citizen customer who demonstrates the utility his or her eligibility. Eligibility Customer means either a low income or senior citizen customer whose arrearage has not accrued as a result of theft or unauthorized use.	The triple constraint theory says that every project will include three constraints budget/cost, time, and scope. And these constraints are tied to each other. Any change made to one of the triple constraints will have an effect on the other two.	An admission management system is a digital solution to manage student enrolments in colleges, universities, and training institutions. Educational institutions use education CRM to distribute inquiries to counsellor/admission teams, follow-up with leads, and complete the enrolment process digitally.		
Focus on J&P, top into BE, understand RC	2. JOBS-TO-BE-DONE / PROBLEMS J&P	9. PROBLEM ROOT CAUSE RC	7. BEHAVIOUR BE		
	Admission is granted through both merit-based and entrance exam-based admission process. The minimum BCA eligibility criteria followed across all top BCA colleges is 50% marks in 10 th +2 or equivalent examination with computer application / computer science as an additional or core subject	The admission process involves filling out an application form and being interviewed by the principal and teachers. Eligible incoming first year students will receive a letter of invitation during the admission process. The outcome of the admission process may affect a student's future career trajectory considerably.	When patients are discharged from the respective wards the discharge paper is prepared in the ward and handed over to the patient. This process takes approximately 3 hours from verbal instructions of discharge to hand over of discharge paper.		
Identify strong, TR & EM	3. TRIGGERS TR	10. YOUR SOLUTION SL	8. CHANNELS of BEHAVIOUR CH		
	A trigger is an event that causes a buyer to have a clear need, which usually converts into a sense of purpose and urgency in their buying process.	<ul style="list-style-type: none"> Simplify the admission process Centralize the process Make the inquiry process as simple as possible Provide online and offline support Keep your applicants engaged and involved 	Admission process if executed manually can involve lot of activities including design of application form, printing of forms/ challans, distribution of forms to students, payment collection, short listing of candidates. The academic institutions have largely adopted the technological tools to manage the crucial academic processes right from "admission to alumni registration". This has made things happen faster and get automatically documented at the same time. But still, there are certain academic processes which are yet to be digitized.		
	4. EMOTIONS: BEFORE / AFTER EM				
	All parts of the job can affect emotions, including the actual job tasks, management styles, co-workers actions, and job pressures. Positive and negative situations at work create long-term emotional responses that can impact job satisfaction, development, and commitment.				

4.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	Calculate admission Prediction	Enter GPA, TOFEL, GRE Scores
FR-2	Check information about the university	Visit the website of the respected university and to contact the alumni and faculties of those universities.
FR-3	Watch campus tour	Check guide for visa application and other procedures
FR-4	Check financial assistance lab	Check scholarship eligibility and application procedure
FR-5	Information about the university and location	Refer official websites and contact directly to the faculty.

4.2 Non-Functional requirements

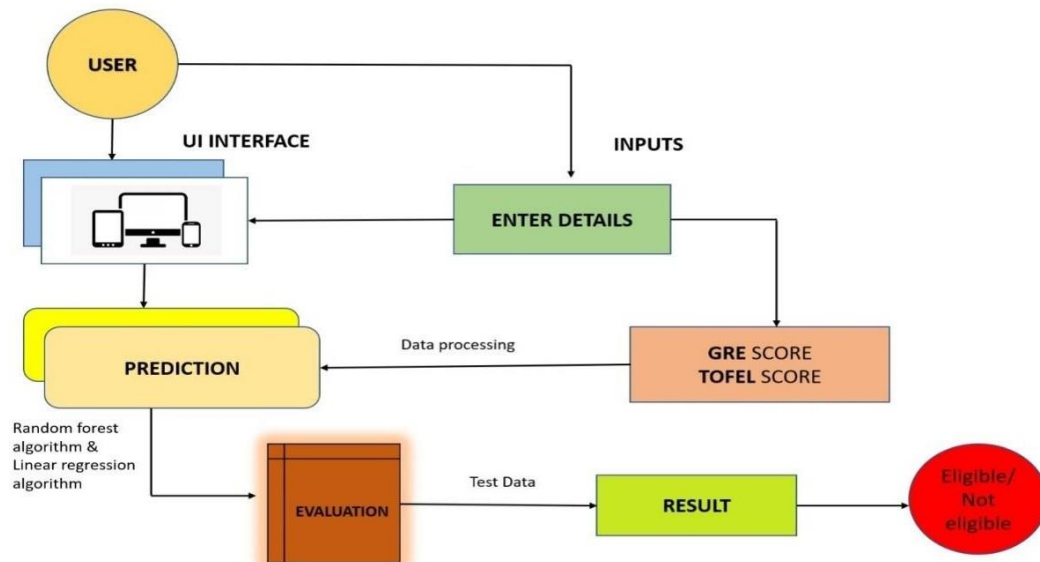
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The UI/UX enhances the user experience. The entire journey of the customer throughout the application will be smooth and user-friendly approach to the user.
NFR-2	Security	It is the safest application you never used it before because it doesn't store your data.
NFR-3	Reliability	The system will give you to the most accurate and exact results.
NFR-4	Performance	The index page supporting more than 1000 users per hour must provide some seconds delay response time in a chrome desktop browser, including the rendering of text and images and over an LTE connection.
NFR-5	Availability	The admission predictor will be available to users 99.9 percent of the time every month
NFR-6	Scalability	The system must be scalable enough to support more than one lacks visits at the same time while maintaining optimal performance.

5.PROJECT DESIGN

5.1 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 the information, and where data is stored.



5.2 Solution & Technical Architecture:

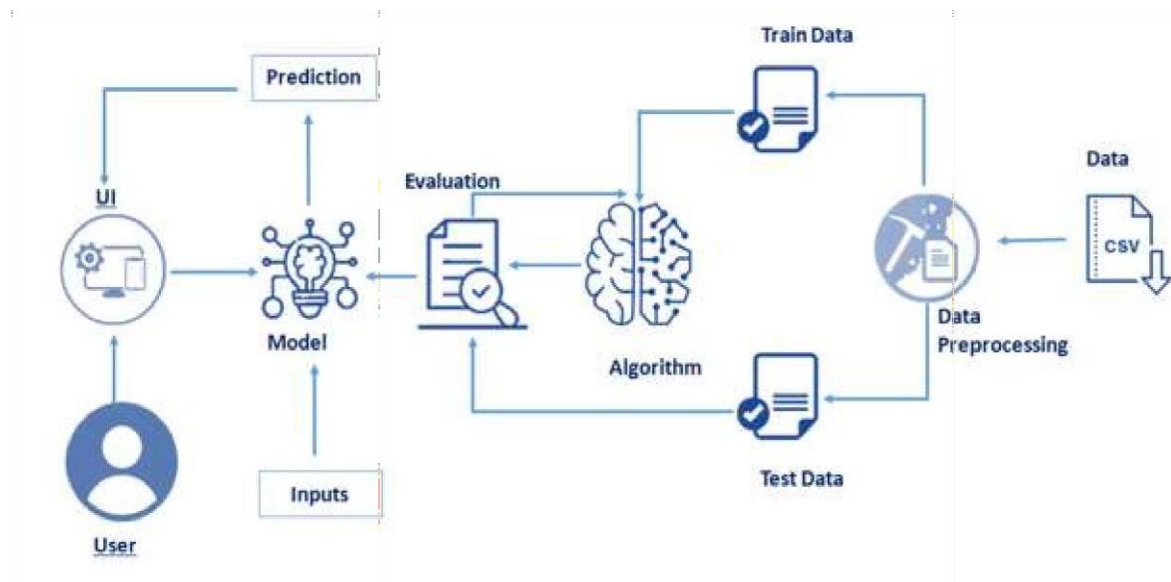


Table-1:Components&Technologies:

S.No	Component	Technology
1.	User Interface	HTML, CSS, Flask
2.	Application Logic-1	Python
3.	Application Logic-2	IBM Watson Assistant
4.	Database	Dataset
5.	Cloud Database	IBM DB2, IBM Cloudant etc.
6.	File Storage	IBM Block Storage or Other Storage Service or Local Filesystem
7.	Machine Learning Model	Random forest, Linear Regression,etc,.

Table-2: Application Characteristics:

S.No	Characteristics	Technology
1.	Open-Source Frameworks	Flask
2.	Performance	Maximum 100 requests per second.

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 can register for the application by entering my email, password, and confirming my password.	2	High	2
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	1
Sprint-1		USN-3	As a user, I can register for the application through Gmail	1	High	1

Sprint-1	Login	USN-4	As a user, I can log into the application by entering email & password	3	High	3
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint -2	Update Profile	USN-5	As a user, after logging in, I will have to update my profile by providing all the required details	5	High	5
Sprint-3	Choose university	USN-6	As a user, I will be able to view the list of Universities that the students are eligible to apply	5	Medium	5
Sprint-3	Choose course	USN-7	As a user, I will be able to view the details of Admission process like date and venue of certification verification	2	Low	2
Sprint-4	Admission process	USN-8	As a user, I will be able to view the list of courses that the students are eligible to apply	3	High	3
Sprint-1	Authentication	USN-9	As a admin, the login credential of the user is authenticated my me	2	High	2

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Sprint-2	Update profile	USN-10	As a admin, I can verify the user entered details	5	High	5
Sprint-3	Prediction	USN-11	As a admin, I can test the trained machine learning model by analysing the user details by machine learning algorithms like logistic regression	3	High	3
Sprint-4	Output	USN-12	As a admin, I can upload the confirmation of user for the prediction into the database.	3	High	5

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	31 Oct 2022	05 Nov 2022	20	50 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

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7. CODING & SOLUTIONING

```
import pandas as pd
from flask import Flask, request, jsonify, render_template
import pickle

app = Flask(__name__)
model = pickle.load(open('regressor.pkl', 'rb'))

@app.route('/')
def home():
    return render_template('index.html')

@app.route('/predict', methods=['GET', 'post'])
def predict():

    GRE_Score = int(request.form['GRE Score'])
    TOEFL_Score = int(request.form['TOEFL Score'])
    University_Rating = int(request.form['University Rating'])
    SOP = float(request.form['SOP'])
    LOR = float(request.form['LOR'])
    CGPA = float(request.form['CGPA'])
    Research = int(request.form['Research'])

    final_features = pd.DataFrame([[GRE_Score, TOEFL_Score, University_Rating, SOP,
    LOR, CGPA, Research]])

    predict = model.predict(final_features)

    output = predict[0]
    if(output<25):
        return render_template('nochance.html', prediction_text='Admission chances
are {}'.format(output))
    else:
        return render_template('chance.html', prediction_text='Admission chances are
{}'.format(output))

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

7.1 Feature 1

```
<!Doctype html>
<html>
<head>
```

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```
<title>UNIVERSITY ADMIT ELIGIBILITY PREDICTOR</title>
<SCRIPT language=Javascript>
    function check(e, value) {
        //Check Charater
        var unicode = e.charCode ? e.charCode : e.keyCode;
        if (value.indexOf(".") != -1)
            if (unicode == 46) return false;
        if (unicode != 8)
            if ((unicode< 48 || unicode> 57) &&unicode != 46) return false;
    }
</SCRIPT>
<meta name="viewport" content="width=device-width, initial-scale=1">
<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/4.7.0/css/font-awesome.min.css">
<style>
body {
    font-family: Arial, Helvetica, sans-serif;
}

* {
    box-sizing: border-box;
}

/* style the container */
.container {
    position: relative;
    border-radius: 5px;
    background-image:url('https://media.istockphoto.com/photos/graduation-cap-and-diploma-on-
table-with-books-picture-
id1154631974?k=20&m=1154631974&s=612x612&w=0&h=RVXFHdj4CtLUAg6jVay-
nKS6PiiwWlmdqbnGN_k33lNQ=') ;
    background-attachment: fixed;
    background-repeat: no-repeat;
    background-size: cover;
    color : white;
}

/* style inputs and link buttons */
input,
.btn {
    width: 100%;
    padding: 12px;
    border: none;
    border-radius: 4px;
    margin: 5px 0;
    opacity: 0.85;
```

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```
display: inline-block;
font-size: 17px;
line-height: 20px;
text-decoration: none; /* remove underline from anchors */
}

input:hover,
.btn:hover {
    opacity: 5;
}

/* style the submit button */
input[type=submit] {
    background-color: #000000;
    color: white;
    cursor: pointer;
}

input[type=submit]:hover {
    background-color: #77ff00;
}

/* Two-column layout */
.col {
    float: left;
    width: 50%;
    margin: auto;
    padding: 0 50px;
}

/* Clear floats after the columns */
.row:after {
    content: "";
    display: table;
    clear: both;
}

/* vertical line */
.vl {
    position: absolute;
    left: 50%;
    transform: translate(-50%);
    border: 2px solid rgb(8, 8, 8);
    height: 490px;
}
```

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```
/* text inside the vertical line
.vl-innertext {
  position: absolute;
  top: 50%;
  transform: translate(-50%, -50%);
  background-color: #f1f1f1;
  border: 1px solid #ccc;
  border-radius: 50%;
  padding: 8px 10px;
} */

/* hide some text on medium and large screens */
.hide-md-lg {
  display: none;
}

/* bottom container */
.bottom-container {
  text-align: center;
}

/* Responsive layout - when the screen is less than 650px wide, make the two columns stack
on top of each other instead of next to each other */
@media screen and (max-width: 650px) {
.col {
  width: 100%;
  height: 100%;
  margin-top: 0;
}
/* hide the vertical line */
.vl {
  display: none;
}
/* show the hidden text on small screens */
.hide-md-lg {
  display: block;
  text-align: center;
}
}

.select {
  width: 100%;
  min-width: 15ch;
  border: 1px solid var(--select-border);
  border-radius: 0.25em;
```


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```
padding: 0.25em 0.5em;
font-size: 1.25rem;
cursor: pointer;
line-height: 1.1;
background-color: #fff;
background-image: linear-gradient(to top, #f9f9f9, #fff 33%);
}

</style>
</head>
<body>

<div class="container">
<form action="{{url_for('predict')}}" method="post">
<div class="row">
<marquee class="bottom-container"><h2>GradeAdmits - If studying abroad is your dream, make
it simple is ours!</h2></marquee>
<div class="v1">
<span class="v1-innertext"></span>
</div>

<div class="col">
<h1>WELCOME TO UNIVERSITY ADMIT ELIGIBILITY PREDICTOR</h1>
<p><b>A simple Web App to predict the chances of getting an admit based on
Student's profile</p></b>
<h3>Input Guide</h3>
<ul>
<li>GRE Score (out of 340)</li>
<li>TOEFL Score (out of 120)</li>
<li>University Rating (out of 5) - the category of the target
university</li>
<li>Statement of Purpose {SOP} Strength (out of 5)</li>
<li>Letter of Recommendation {LOP} Strength (out of 5)</li>
<li>Undergraduate CGPA (out of 10)</li>
<li>Research Experience (0 for NONE and 1 for YES)</li>

</ul>
</div>

<div class="col">
<div class="hide-md-lg">

<input type="number" name="GRE Score" placeholder="GRE Score"
required="required" min="0" max="340"/>
<input type="number" name="TOEFL Score" placeholder="TOEFL Score"
```

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```
required="required" min="0" max="120"/>
    <input type="number" name="University Rating" placeholder="University
Rating" required="required" min="1" max="5"/>
    <input type="number" name="SOP" placeholder="SOP" required="required"
onkeypress="return check(event,value)" step="0.1" min="1" max="5"/>
    <input type="number" name="LOR" placeholder="LOR" required="required"
onkeypress="return check(event,value)" step="0.1" min="1" max="5"/>
    <input type="number" name="CGPA" placeholder="CGPA"
required="required" onkeypress="return check(event,value)" step="0.01" min="1" max="10"/>
    <input type="number" name="Research" placeholder="Research"
required="required" min="0" max="1"/>
<br><br><br>
    <input type="submit" value="Predict"></input>
<br><br><br><br><br><br><br><br><br>
<h4 style="text-align: center;">{{prediction_text}}</h4>

</div>
</div>
</form>
</div>
</body>
</html>
```

7.2 Feature 2

```
<!Doctype html>
<html>
<title>CHANCE</title>
<head>
<h1 style="text-align:center;"> PREDICTING CHANCE OF ADMISSION</h1>
<h4 style="text-align:center;color: blue;"> PREDICTION: YOU HAVE A
CHANCE</h4>
<p style="text-align:center;"><imgsrc="https://media.tenor.com/bBGOaRPgtvQAAAAi/good-
menhera.gif;" ></p>
<style>
    body
    {
        background-image: url('https://swall.teahub.io/photos/small/4-
46405_macbook-apple-computer-wallpaper-web-development.jpg');
        background-repeat: no-repeat;
        background-attachment: fixed;
        background-size: cover;
    }
    button,
    .btn {
        width: 100%;
```

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```
padding: 12px;
border: none;
border-radius: 4px;
margin: 5px 0;
opacity: 0.85;
display: inline-block;
font-size: 17px;
line-height: 20px;
text-decoration: none; /* remove underline from anchors */
}
button:hover,
.btn:hover {
    opacity: 5;
}

/* style the submit button */button[type=submit] {
    background-color: #000000;
color: white;
    cursor: pointer;
}
button[type=submit]:hover {
    background-color: #77ff00;
}
</style>
</head>
<body>
<h1 style="text-align: center;">Which Department will you choose :) </h1>
<a href="enggchance.html"><button class="button">Engineering</button></a>
<a href="med.html"><button class="button">Medicine and
Lifesciences</button></a>
<a href="bus.html"><button class="button">Business Administration and
Management</button></a>
<a href="com.html"><button class="button">Computer Science and Information
Technology</button></a>
<a href="math.html"><button class="button">Mathematics</button></a>
<a href="art.html"><button class="button">Art and Cutlure</button></a>
</body>
</html>
```

Nochance.html

```
<!Doctype html>
<html>
<title>sample</title>
<head>
<h1 style="text-align:center;"> PREDICTING CHANCE OF ADMISSION</h1>
```

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```
<h4 style="text-align:center;"> PREDICTION: YOU DON'T HAVE A CHANCE</h4>
<p style="text-align:center;"></p>
<style>
    body
    {
        background-image: url('https://swall.teahub.io/photos/small/4-46405_macbook-
apple-computer-wallpaper-web-development.jpg');
        background-repeat: no-repeat;
        background-attachment: fixed;
        background-size: cover;
    }
</style>
</head>
<body>
</html>
```

OUTPUT

GradeAdmits - If studying abroad is your dream, make it simple is ours!

WELCOME TO UNIVERSITY ADMIT ELIGIBILITY PREDICTOR

A simple Web App to predict the chances of getting an admit based on Student's profile

Input Guide

- GRE Score (out of 340)
- TOEFL Score (out of 120)
- University Rating (out of 5) - the category of the target university
- Statement of Purpose (SOP) Strength (out of 5)
- Letter of Recommendation (LOR) Strength (out of 5)
- Undergraduate CGPA (out of 10)
- Research Experience (0 for NONE and 1 for YES)

GRE Score

TOEFL Score

University Rating

SOP

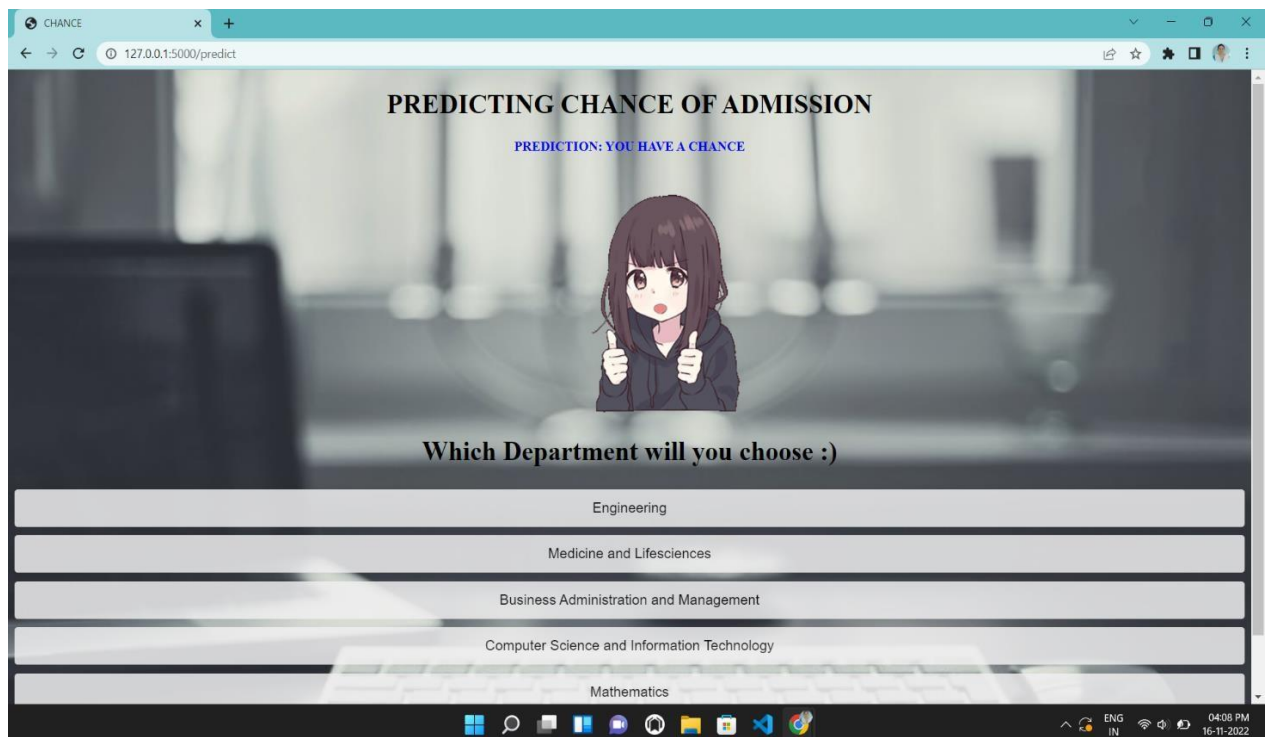
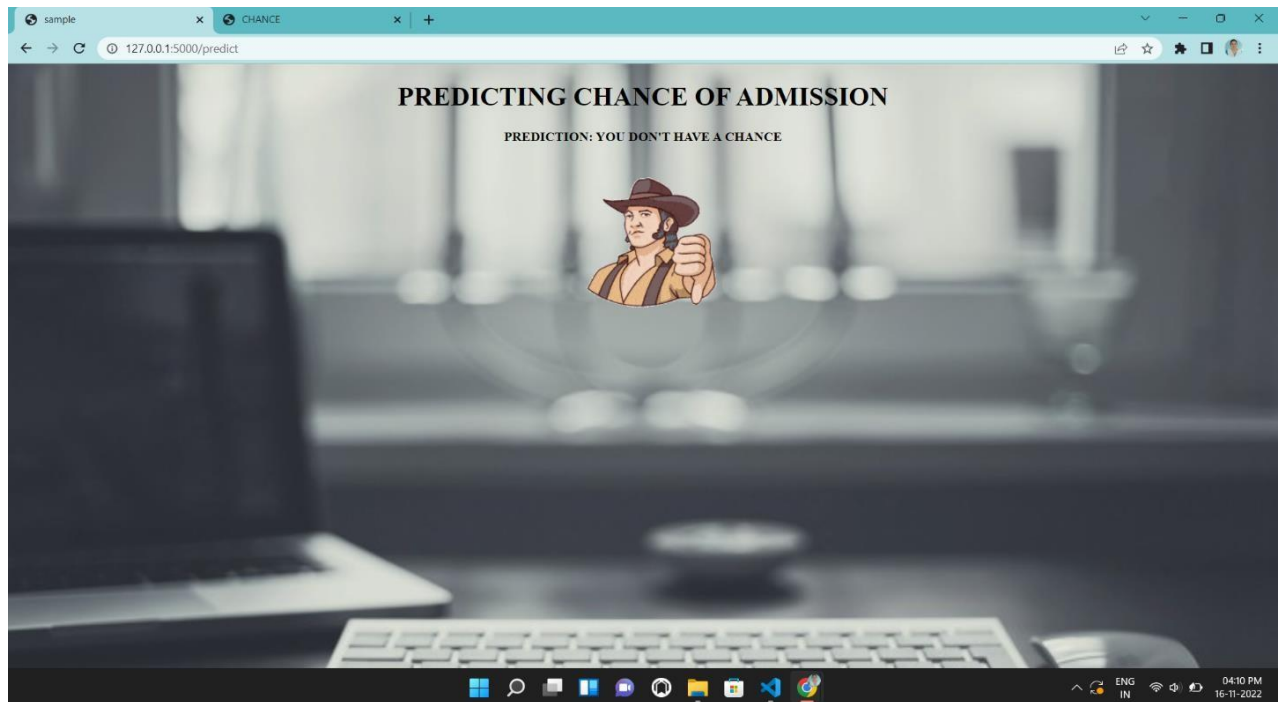
LOR

CGPA

Research

Predict

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7.3 Database Schema

Chance of Admission (ranging from 0 to 1)

```
In [1]: import pandas as pd # used for dataframe manipulation
import numpy as np # used for mathematical operations
import seaborn as sns
import matplotlib.pyplot as plt
# so that our visualization labels are clearly visible
```

```
In [2]: admission_df = pd.read_csv("Admission_Predict.csv")
```

```
In [3]: admission_df.head()
```

```
Out[3]:
```

	Serial No.	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research	Chance of Admit
0	1	337	118	4	4.5	4.5	9.65	1	0.92
1	2	324	107	4	4.0	4.5	8.87	1	0.76
2	3	316	104	3	3.0	3.5	8.00	1	0.72
3	4	322	110	3	3.5	2.5	8.67	1	0.80
4	5	314	103	2	2.0	3.0	8.21	0	0.65

```
In [4]: admission_df.drop('Serial No.', axis = 1, inplace = True) # inplace: so that it is removed from memory
```

```
In [5]: admission_df.sample()
```

```
Out[5]:
```

	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research	Chance of Admit
218	324	110	4	3.0	3.5	8.97	1	0.84

```
In [6]: # checking for null values
admission_df.isnull().sum() # summation(counts) of all the null values
```

```
In [6]: # checking for null values
admission_df.isnull().sum() # summation(counts) of all the null values
```

```
Out[6]:
```

GRE Score	0
TOEFL Score	0
University Rating	0
SOP	0
LOR	0
CGPA	0
Research	0
Chance of Admit	0
dtype:	int64

```
In [7]: # getting information about the dataframe
admission_df.info()
```

```
RangeIndex: 500 entries, 0 to 499
Data columns (total 8 columns):
#   Column              Non-Null Count  Dtype
---  ---
0   GRE Score            500 non-null    int64
1   TOEFL Score          500 non-null    int64
2   University Rating    500 non-null    int64
3   SOP                  500 non-null    float64
4   LOR                  500 non-null    float64
5   CGPA                 500 non-null    float64
6   Research             500 non-null    int64
7   Chance of Admit      500 non-null    float64
dtypes: float64(4), int64(4)
memory usage: 31.4 KB
```

```
In [8]: # statistical summary of the dataframe
admission_df.describe()
```

```
Out[8]:
```

	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research	Chance of Admit
count	500.000000	500.000000	500.000000	500.000000	500.000000	500.000000	500.000000	500.000000
mean	316.472000	107.192000	3.114000	3.374000	3.484000	8.576440	0.560000	0.72174

The screenshot shows a Jupyter Notebook with the following content:

```

Out[8]:
  GRE Score  TOEFL Score  University Rating  SOP  LOR  CGPA  Research  Chance of Admit
count  500.000000    500.000000    500.000000  500.000000  500.000000  500.000000  500.000000    500.000000
mean    316.472000    107.192000     3.114000    3.374000    3.48400    8.576440    0.560000     0.72174
std      11.295148      6.081868     1.143512    0.991004    0.92545    0.604813    0.496884     0.14114
min     290.000000     92.000000     1.000000    1.000000    1.00000    6.800000    0.000000     0.34000
25%     308.000000    103.000000     2.000000    2.500000    3.00000    8.127500    0.000000     0.63000
50%     317.000000    107.000000     3.000000    3.500000    3.50000    8.560000    1.000000     0.72000
75%     325.000000    112.000000     4.000000    4.000000    4.00000    9.040000    1.000000     0.82000
max     340.000000    120.000000     5.000000    5.000000    5.00000    9.920000    1.000000     0.97000

In [9]:
# IGNORE
# group by University Ranking
university_df = admission_df.groupby(by = 'University Rating')
university_df

Out[9]:

In [10]:
# group by University Ranking
university_df = admission_df.groupby(by = 'University Rating').mean()
university_df

Out[10]:
  GRE Score  TOEFL Score  SOP  LOR  CGPA  Research  Chance of Admit
University Rating
1  304.911765    100.205882  1.941176  2.426471  7.798529  0.294118    0.562059
2  309.134921    103.444444  2.682540  2.956349  8.177778  0.293651    0.626111
3  315.030864    106.314815  3.308642  3.401235  8.500123  0.537037    0.702901
4  323.304762    110.961905  4.000000  3.947619  8.936667  0.780952    0.801619

```

8. TESTING

8.1 Test Cases

UNIVERSITY ADMIT ELIGIBILITY P

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WELCOME TO UNIVERSITY ADMIT ELIGIBILITY PREDICTOR

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- Undergraduate CGPA (out of 10)
- Research Experience (0 for NONE and 1 for YES)

300

110

5

4

4

9

1


Predict

ENG IN 04:08 PM 16-11-2022

CHANCE

PREDICTING CHANCE OF ADMISSION

PREDICTION: YOU HAVE A CHANCE



Which Department will you choose :)

Engineering

Medicine and Lifesciences

Business Administration and Management

Computer Science and Information Technology

Mathematics

ENG IN 04:08 PM 16-11-2022

GradeAdmits - If studying abroad is your dream, make it simple is ours!

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- Statement of Purpose (SOP) Strength (out of 5)
- Letter of Recommendation (LOP) Strength (out of 5)
- Undergraduate CGPA (out of 10)
- Research Experience (0 for NONE and 1 for YES)

100

20

5

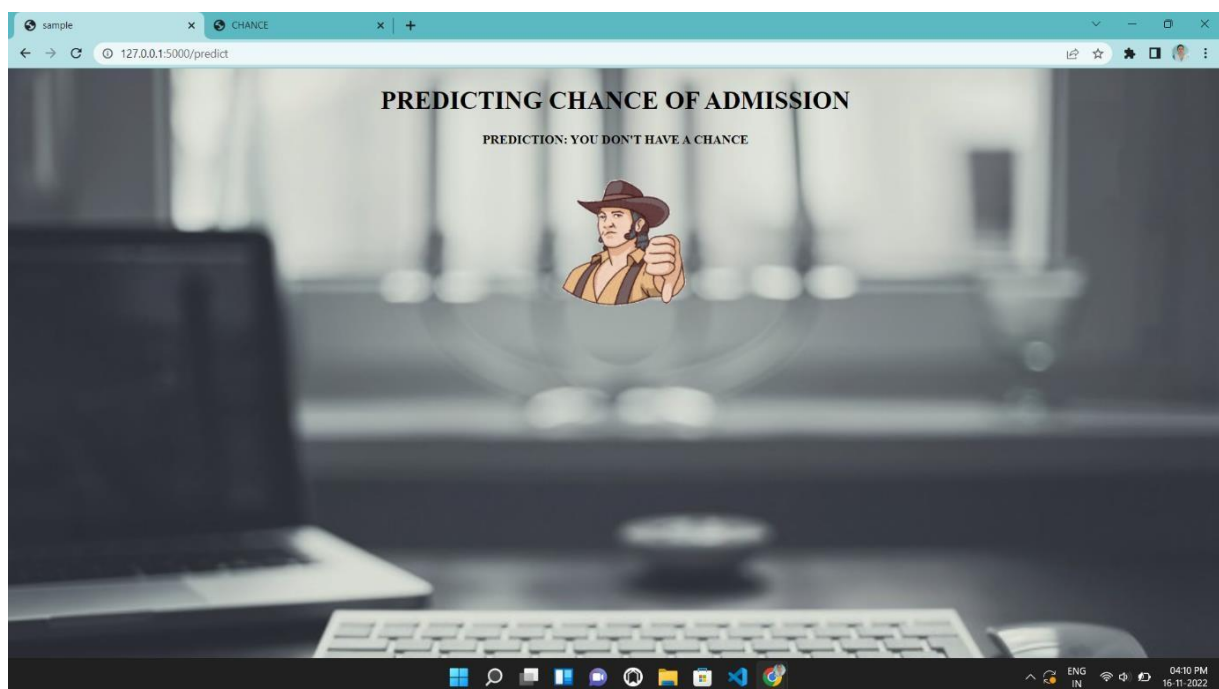
2

2

7

1

Predict



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.

Purpose of UAT

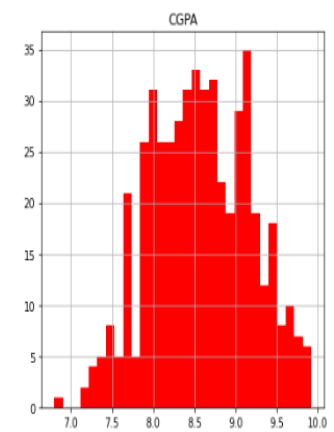
The main Purpose of UAT is to validate end to end business flow. It does not focus on cosmetic errors, spelling mistakes or system testing. User Acceptance Testing is carried out in a separate testing environment with production-like data setup. It is kind of black box testing where two or more end-users will be involved. UAT is performed by -

- Client
- End users

Need of User Acceptance Testing arises once software has undergone Unit, Integration and System testing because developers might have built software based on requirements document by their own understanding and further required changes during development may not be effectively communicated to them, so for testing whether the final product is accepted by client/end-user, user acceptance testing is needed.

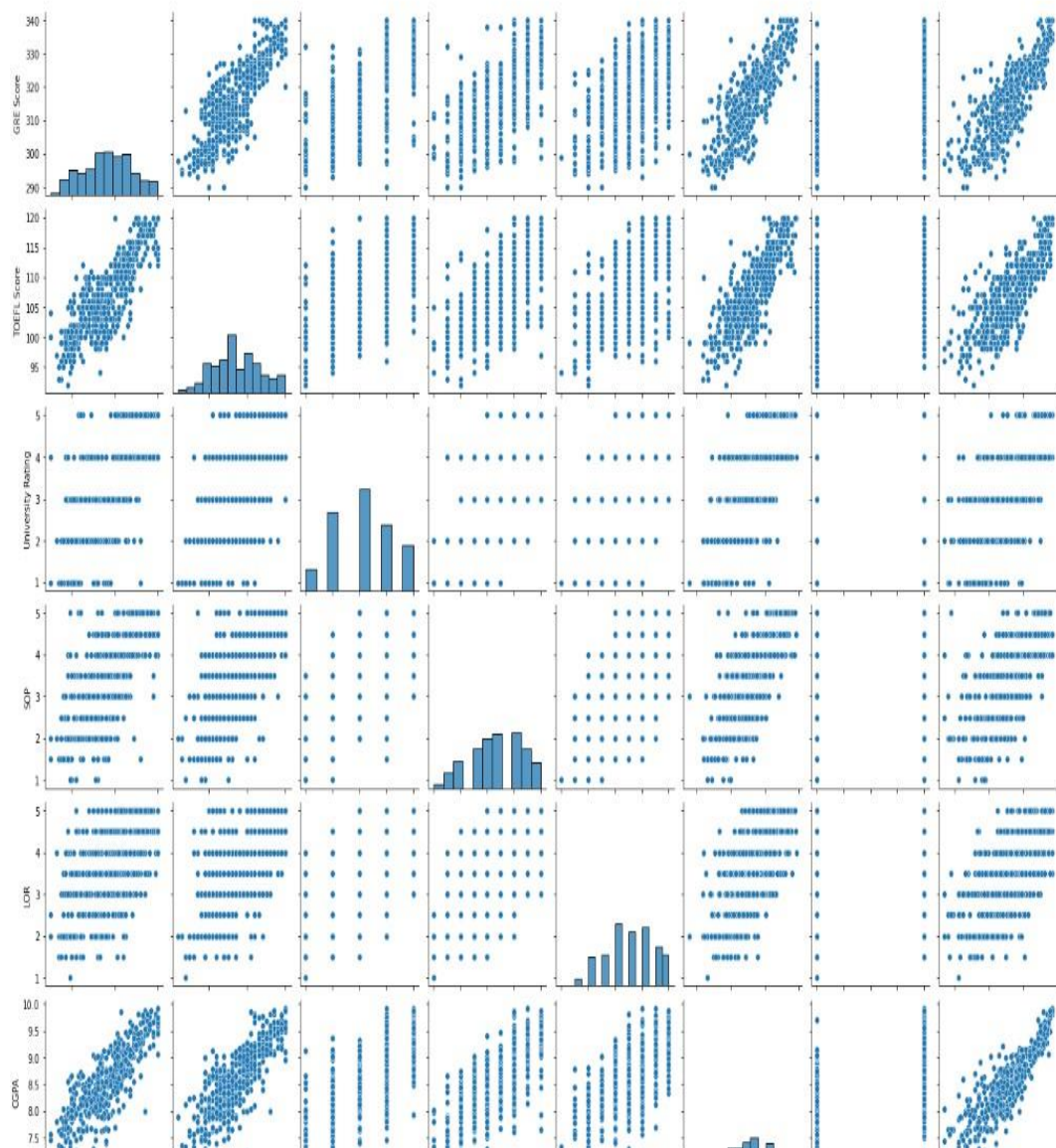
Developers code software based on requirements document which is their “own” understanding of the requirements and may not actually be what the client needs from the software.

Requirements changes during the course of the project may not be communicated effectively to the developers.



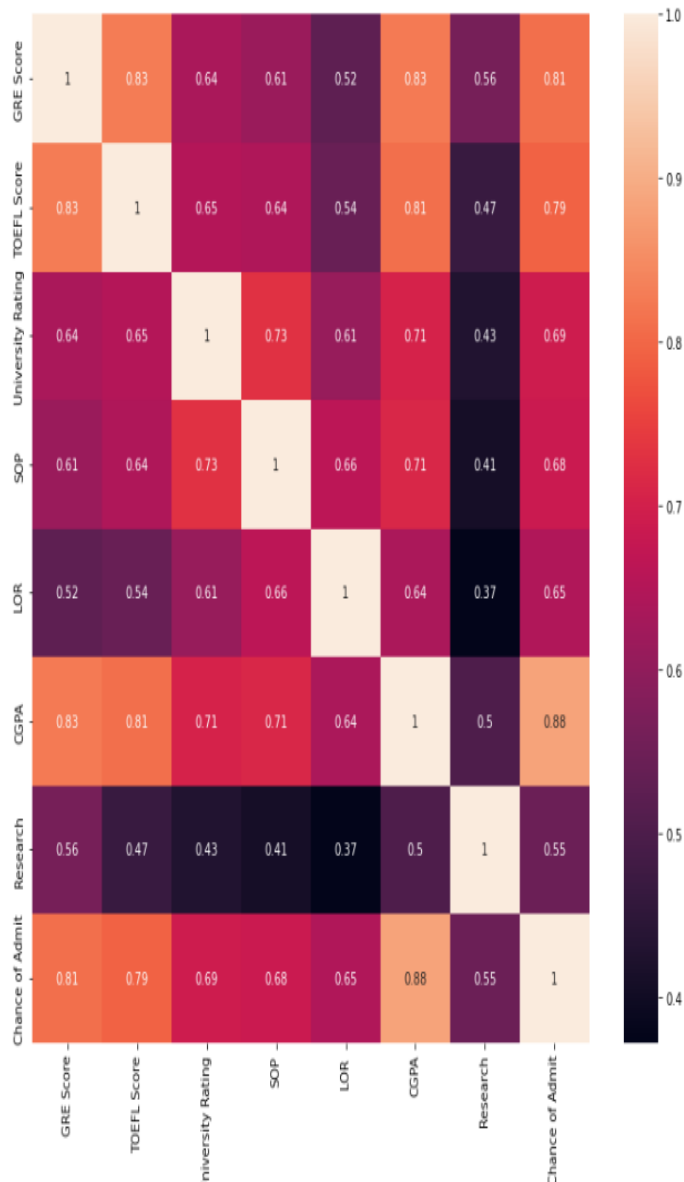
```
In [12]: sns.pairplot(admission_df)
# can look at any type of relationship through pairplot
```

Out[12]:



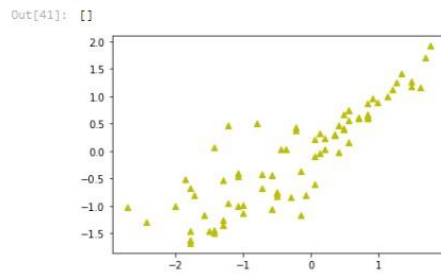
PNT2022TMID48455

```
In [13]: # correlation matrix, heatmap
corr_matrix = admission_df.corr()
plt.figure(figsize = (12,12))
sns.heatmap(corr_matrix, annot = True) # annot: so that numbers are shown in the heatmap
plt.show()
```



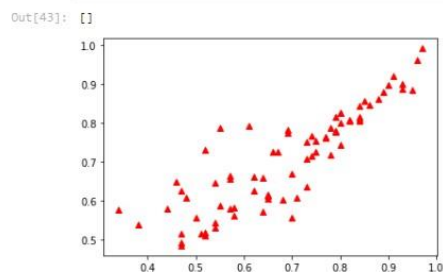
Calculating Regression Model

```
In [41]: y_predict = regressor.predict(X_test)
plt.plot(y_test, y_predict, '^', color = 'y') # '^' means to show data points in a triangular format
plt.xlabel('y_test (Ground Truth)')
```



```
In [42]: # applying inverse transform to represent the data in its original units
#(as earlier we did feature scaling, gonna reverse that so that data makes sense in its original units)
y_predict_orig = scaler_y.inverse_transform(y_predict)
y_test_orig = scaler_y.inverse_transform(y_test)
```

```
In [43]: plt.plot(y_test_orig, y_predict_orig, '^', color = 'r')
```



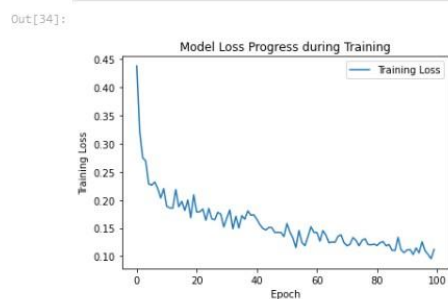
```
In [32]: result = ANN_model.evaluate(X_test, y_test)
accuracy_ANN = 1 - result
print("Accuracy : {}".format(accuracy_ANN))

3/3 [=====] - 0s 3ms/step - loss: 0.4360
Accuracy : 0.564020462673187
```

```
In [33]: # Looking at the progression of the network throughout the number of epochs
epochs_hist.history.keys()
```

Out[33]: dict_keys(['loss'])

```
In [34]: # Loss => progression of network throughout the no. of epochs
plt.plot(epochs_hist.history['loss'])
plt.title('Model Loss Progress during Training')
plt.xlabel('Epoch')
plt.ylabel('Training Loss')
plt.legend(['Training Loss']) # for Label/box in the plot
```



77.8% accuracy of ANN model

10. ADVANTAGES

- Give more accurate options for foreign universities.
- Train more quickly, especially with bigger datasets.
- GRADE has minimal software and hardware dependencies.
- It is implemented in Python with the Pandas and Skit-learn packages, which are open source and freely available.
- It uses many algorithms like random forest, K-nearest neighbour, multilayer perceptron.
- The simplest way to determine whether a person is eligible for a university or college as well as being completely objective and transparent.
- Easy to implement evaluation of the conditional probability is simple.
- Individuals would no longer need to rely on consultancies that may have contracts with schools and universities that are somewhat off the list.

DISADVANTAGES

- It is used to display the result as a dotted graph.
- It is to predict the approximate value.
- Contrarily, linear regression presumes that the relationship between the dependent and independent variables is linear. This implies that it considers their relationship to be linear. The independence of the qualities is assumed.
- It is not always true that the conditional independence assumption is true. The feature often exhibits some sort of dependence.

11.CONCLUSION

University Admit Eligibility Prediction representation is built by using different types of algorithms. Same dataset is trained for the three algorithms and by training the representation we obtained the results. Finally, Random Forest is the best algorithm to provide accurate result for the dataset that is available. The accuracy level we obtained using Random Forest is 94%, which is very encouraging. A user interface to interact with scholars to see the result is created using Node-RED.

12.FUTURE SCOPE

The future scope of this project is very broad. Few of them are:

- This can be implemented in less time for the proper admission process.
- This can be accessed anytime anywhere, since it is a web application provided only an internet connection.
- The user had not need to travel a long distance for the admission and his/her time is also saved as a result of this automated system.

13. APPENDIX

Source Code

```
import pandas as pd
from flask import Flask, request, jsonify, render_template
import pickle
app = Flask(__name__)
model = pickle.load(open('regressor.pkl', 'rb'))
@app.route('/')
def home():
    return render_template('index.html')

@app.route('/predict', methods=['GET', 'post'])
def predict():

    GRE_Score = int(request.form['GRE Score'])
    TOEFL_Score = int(request.form['TOEFL Score'])
    University_Rating = int(request.form['University Rating'])
    SOP = float(request.form['SOP'])
    LOR = float(request.form['LOR'])
    CGPA = float(request.form['CGPA'])
    Research = int(request.form['Research'])

    final_features = pd.DataFrame([[GRE_Score, TOEFL_Score, University_Rating,
    SOP, LOR, CGPA, Research]])

    predict = model.predict(final_features)

    output = predict[0]
    if(output<25):
        return render_template('nochance.html', prediction_text='Admission
chances are {}'.format(output))
    else:
        return render_template('chance.html', prediction_text='Admission
chances are {}'.format(output))

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

7.1 Feature 1

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<!DOCTYPE

html>

```
<html>
<head>
<title>UNIVERSITY ADMIT ELIGIBILITY PREDICTOR</title>
<SCRIPT language=Javascript>
    function check(e, value) {
        //Check Charater
        var unicode = e.charCode ? e.charCode : e.keyCode;
        if (value.indexOf(".") != -1)
            if (unicode == 46) return false;
        if (unicode != 8)
            if ((unicode< 48 || unicode> 57) &&unicode != 46) return false;
    }
</SCRIPT>
<meta name="viewport" content="width=device-width, initial-scale=1">
<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/4.7.0/css/font-awesome.min.css">
<style>
body {
    font-family: Arial, Helvetica, sans-serif;
}
* {
    box-sizing: border-box;
}
/* style the container */
.container {
    position: relative;
    border-radius: 5px;
    background-image:url('https://media.istockphoto.com/photos/graduation-cap-
and-diploma-on-table-with-books-picture-
id1154631974?k=20&m=1154631974&s=612x612&w=0&h=RVXFHdj4CtLUAg6jVay-
nKS6PiiwwlmdqbvGN_k33lNQ=') ;
    background-attachment: fixed;
    background-repeat: no-repeat;
    background-size: cover;
color : white;
}
/* style inputs and link buttons */
input,
.btn {
    width: 100%;
    padding: 12px;
    border: none;
    border-radius: 4px;
    margin: 5px 0;
```

```
        opacity: 0.85;
        display: inline-block;
        font-size: 17px;
        line-height: 20px;
        text-decoration: none; /* remove underline from anchors */
    }
    input:hover,
    .btn:hover {
        opacity: 5;
    }
    /* style the submit button */
    input[type=submit] {
        background-color: #000000;
        color: white;
        cursor: pointer;
    }
    input[type=submit]:hover {
        background-color: #77ff00;
    }
    /* Two-column layout */
    .col {
        float: left;
        width: 50%;
        margin: auto;
        padding: 0 50px;
    }
    /* Clear floats after the columns */
    .row:after {
        content: "";
        display: table;
        clear: both;
    }
    /* vertical line */
    .vl {
        position: absolute;
        left: 50%;
        transform: translate(-50%);
        border: 2px solid rgb(8, 8, 8);
        height: 490px;
    }
    /* text inside the vertical line
    .vl-innertext {
        position: absolute;
        top: 50%;
        transform: translate(-50%, -50%);
        background-color: #f1f1f1;
```

```
        border: 1px solid #ccc;
        border-radius: 50%;
        padding: 8px 10px;
    } */
/* hide some text on medium and large screens */
.hide-md-lg {
    display: none;
}
/* bottom container */
.bottom-container {
    text-align: center;
}
/* Responsive layout - when the screen is less than 650px wide, make the two
columns stack on top of each other instead of next to each other */
@media screen and (max-width: 650px) {
.col {
    width: 100%;
    height: 100%;
    margin-top: 0;
}
/* hide the vertical line */
.vl {
    display: none;
}
/* show the hidden text on small screens */
.hide-md-lg {
    display: block;
    text-align: center;
}
}
.select {
    width: 100%;
    min-width: 15ch;
    border: 1px solid var(--select-border);
    border-radius: 0.25em;
    padding: 0.25em 0.5em;
    font-size: 1.25rem;
    cursor: pointer;
    line-height: 1.1;
    background-color: #fff;
    background-image: linear-gradient(to top, #f9f9f9, #fff 33%);
}
</style>
</head>
<body>
<div class="container">
```

```

<form action="{{url_for('predict')}}" method="post">
<div class="row">
<marquee class="bottom-container"><h2>GradeAdmits - If studying abroad is your
dream, make it simple is ours!</h2></marquee>
<div class="vl">
<span class="vl-innertext"></span>
</div>
<div class="col">
<h1>WELCOME TO UNIVERSITY ADMIT ELIGIBILITY PREDICTOR</h1>
<p><b>A simple Web App to predict the chances of getting an admit based
on Student's profile</p></b>
<h3>Input Guide</h3>
<ul>
<li>GRE Score (out of 340)</li>
<li>TOEFL Score (out of 120)</li>
<li>University Rating (out of 5) - the category of the
target university</li>
<li>Statement of Purpose {SOP} Strength (out of 5)</li>
<li>Letter of Recommendation {LOP} Strength (out of
5)</li>
<li>Undergraduate CGPA (out of 10)</li>
<li>Research Experience (0 for NONE and 1 for YES)</li>
</ul>
</div>
<div class="col">
<div class="hide-md-lg">
<input type="number" name="GRE Score" placeholder="GRE
Score" required="required" min="0" max="340"/>
<input type="number" name="TOEFL Score"
placeholder="TOEFL Score" required="required" min="0" max="120"/>
<input type="number" name="University Rating"
placeholder="University Rating" required="required" min="1" max="5"/>
<input type="number" name="SOP" placeholder="SOP"
required="required" onkeypress="return check(event,value)" step="0.1" min="1"
max="5"/>
<input type="number" name="LOR" placeholder="LOR"
required="required" onkeypress="return check(event,value)" step="0.1" min="1"
max="5"/>
<input type="number" name="CGPA" placeholder="CGPA"
required="required" onkeypress="return check(event,value)" step="0.01" min="1"
max="10"/>
<input type="number" name="Research"
placeholder="Research" required="required" min="0" max="1"/>
<br><br><br>
<input type="submit" value="Predict"></input>

```

```

<br><br><br><br><br><br><br><br><br>
<h4 style="text-align: center; "{{prediction_text}}</h4>

</div>
</div>
</form>
</div>
</body>
</html>

```

7.2 Feature 2

```

<!DOCTYPE
html>

<html>
<title>CHANCE</title>
<head>
<h1 style="text-align:center;"> PREDICTING CHANCE OF ADMISSION</h1>
<h4 style="text-align:center;color: blue;"> PREDICTION: YOU HAVE A CHANCE</h4>
<p style="text-align:center;"><imgsrc="https://media.tenor.com/bBG0aRPgtvQAAAAi/good-menhera.gif;" ></p>
<style>

    Body
    {
        background-image: url('https://swall.teahub.io/photos/small/4-46405_macbook-apple-computer-wallpaper-web-development.jpg');
        background-repeat: no-repeat;
        background-attachment: fixed;
        background-size: cover;
    }
    button,
    .btn {
        width: 100%;
        padding: 12px;
        border: none;
        border-radius: 4px;
        margin: 5px 0;
        opacity: 0.85;
        display: inline-block;
        font-size: 17px;
        line-height: 20px;
        text-decoration: none; /* remove underline from anchors */
    }
    button:hover,
    .btn:hover {

```

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```
        opacity: 5;
    }
    /* style the submit button */button[type=submit] {
        background-color: #000000;
        color: white;
        cursor: pointer;
    }
    button[type=submit]:hover {
        background-color: #77ff00;
    }
</style>
</head>
<body>
<h1 style="text-align: center;">Which Department will you choose :) </h1>
<a href="enggchance.html"><button class="button">Engineering</button></a>
<a href="med.html"><button class="button">Medicine and
Lifesciences</button></a>
<a href="bus.html"><button class="button">Business Administration and
Management</button></a>
<a href="com.html"><button class="button">Computer Science and Information
Technology</button></a>
<a href="math.html"><button class="button">Mathematics</button></a>
<a href="art.html"><button class="button">Art and Cutlure</button></a>
</body>
</html>
```

<!DOCTYPE
html>

```
<html>
<title>sample</title>
<head>
<h1 style="text-align:center;"> PREDICTING CHANCE OF ADMISSION</h1>
<h4 style="text-align:center;"> PREDICTION: YOU DON'T HAVE A CHANCE</h4>
<p style="text-align:center;"></p>
<style>
        body
        {
            background-image: url('https://swall.teahub.io/photos/small/4-
46405_macbook-apple-computer-wallpaper-web-development.jpg');
            background-repeat: no-repeat;
            background-attachment: fixed;
            background-size: cover;
        }
    </style>
```

PNT2022TMID48455

```
</style>
</head>
<body>
</html>
```

SCREENSHOTS

UNIVERSITY ADMIT ELIGIBILITY P

GradeAdmits - If studying abroad is your dream, make it simple is ours!

WELCOME TO UNIVERSITY ADMIT ELIGIBILITY PREDICTOR

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Input Guide

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- TOEFL Score (out of 120)
- University Rating (out of 5) - the category of the target university
- Statement of Purpose (SOP) Strength (out of 5)
- Letter of Recommendation (LOR) Strength (out of 5)
- Undergraduate CGPA (out of 10)
- Research Experience (0 for NONE and 1 for YES)

GRE Score

TOEFL Score

University Rating

SOP

LOR

CGPA

Research

Predict

UNIVERSITY ADMIT ELIGIBILITY P

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- Letter of Recommendation (LOR) Strength (out of 5)
- Undergraduate CGPA (out of 10)
- Research Experience (0 for NONE and 1 for YES)

300

110

5

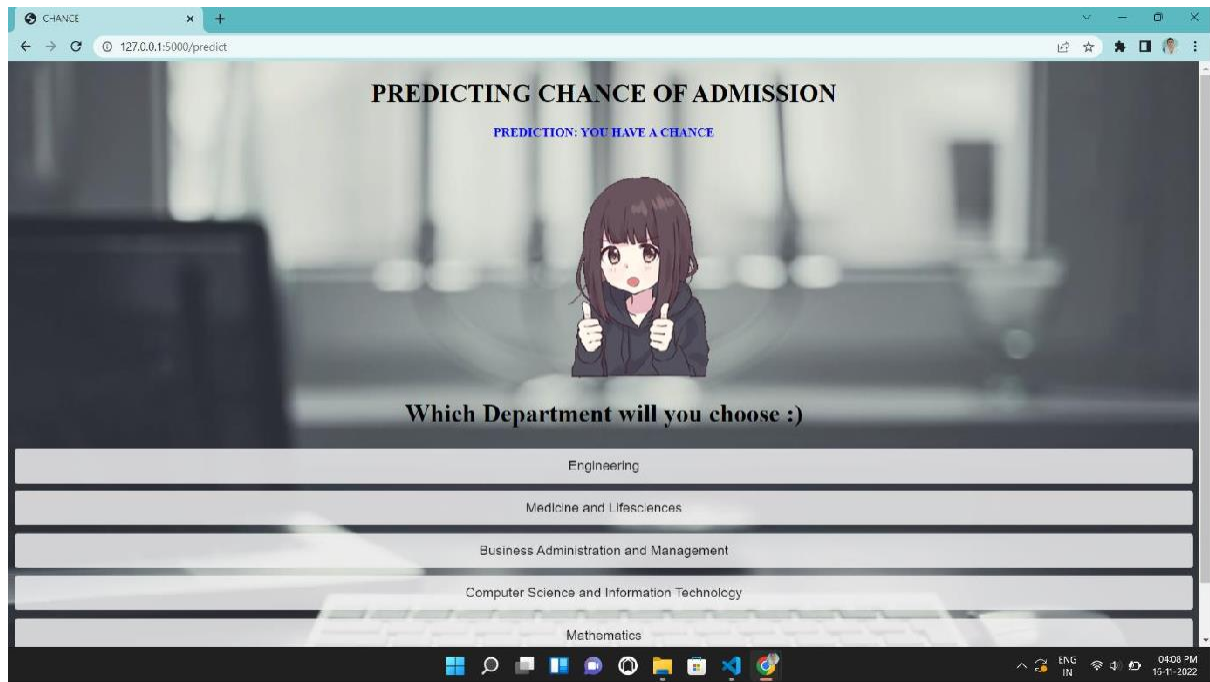
4

4

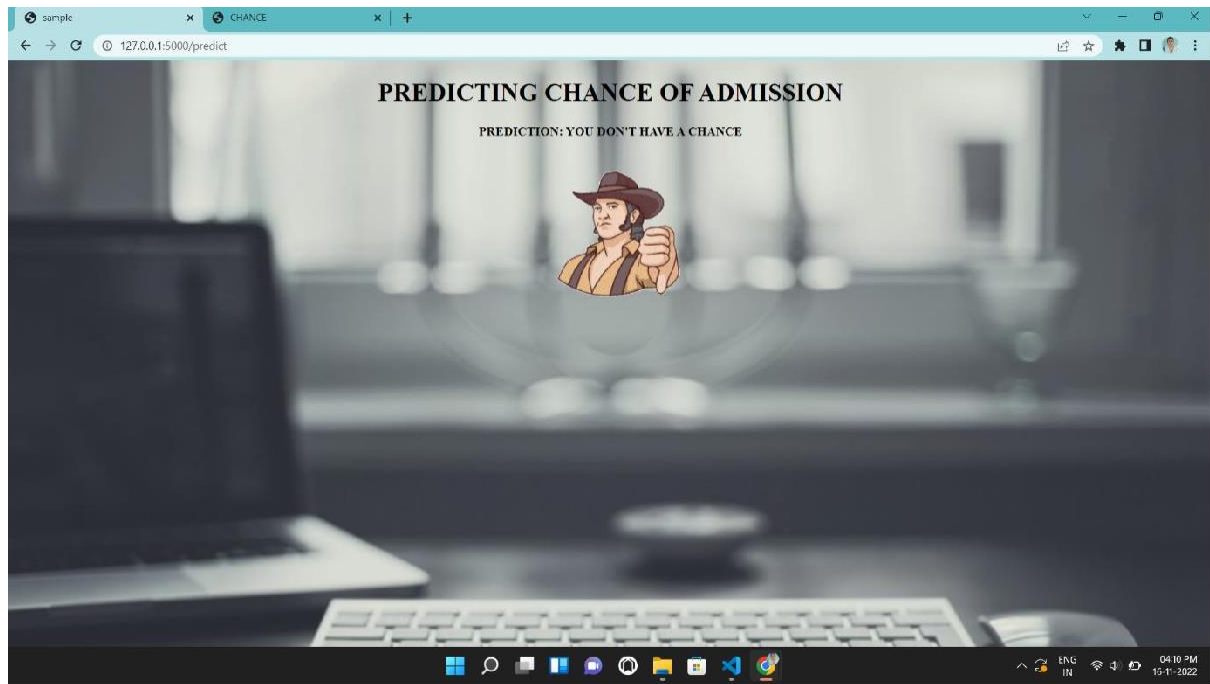
9

1

Predict



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GitHub Link:

<https://github.com/IBM-EPBL/IBM-Project-38582-1660382737>

Video Demo Link:

<https://drive.google.com/file/d/1VFFzI358B3yDUshpf3iat25-uDEVkIQc/view?usp=drivesdk>

TEAM MEMBERS:

SUSHMA S (TEAM LEADER)

SUSHMA S (TEAM MEMBER 1)

SUBASHINI E (TEAM MEMBER 2)

KARTHIKA DEVI K (TEAM MEMBER 3)

PRADEEPA S (TEAM MEMBER 4)