UNIVERSITY ADMIT ELIGIBILITY PREDICTOR

TEAM ID: PNT2022TMID39194

TEAM MEMBERS: Nithish S, Sharan A, Vikash S, Vishal.B

I. INTRODUCTION:

1.1. Project Overview

This project overlooks on the prediction or scope of a student who is aspiring to pursue a master's degree in the course he / she desires to get into. A Machine Learning model is deployed to predict the chances of eligibility.

1.2 Purpose

The simplest way to determine which universities or colleges a person will be admitted to is through university prediction. This method is also completely unbiased and open-book. Individuals would no longer be need to rely on consultancies that may have contracts with a list of schools or universities but may be slightly biassed in that direction. Additionally, limiting applications to only those colleges or universities where a student has a real chance would speed up the application process.

II. LITERATURE SURVEY:

2.1 Existing Problem

The main drawback of the previous research done on this is they didn't consider all the factors which will contribute in the student admission process like TOEFL, SOP, LOR and under graduate score. This in turn creates a sense of fear amongst students who use prediction websites & get falsified results.

2.2 References

- *College Admission Predictor:* *https://www.jncet.org/Manuscripts/Volume-8/Issue-4/Vol-8-issue-4-M-32.pdf*
- *GRADUATE ADMISSION PREDICTION USING MACHINE LEARNING* *https://www.researchgate.net/publication/348433004_Graduate_Admission_Prediction_Using_Machine_Learning*
- *GRADUATE ADMISSION CHANCE PREDICTION USING DEEP NEURAL NETWORK:* *https://ieeexplore.ieee.org/abstract/document/9397988*
- *Graduate University Admission Predictor using Machine Learning:* *https://www.ijmtst.com/volume6/issue12/92.IJMTST0612246.pdf*
- *A Statistical Approach to Graduate Admissions' Chance Prediction:* *https://www.researchgate.net/publication/339653123_A_Statistical_Approach_to_Graduate_Admissions'_Chance_Prediction*

2.3 Problem Statement Definition

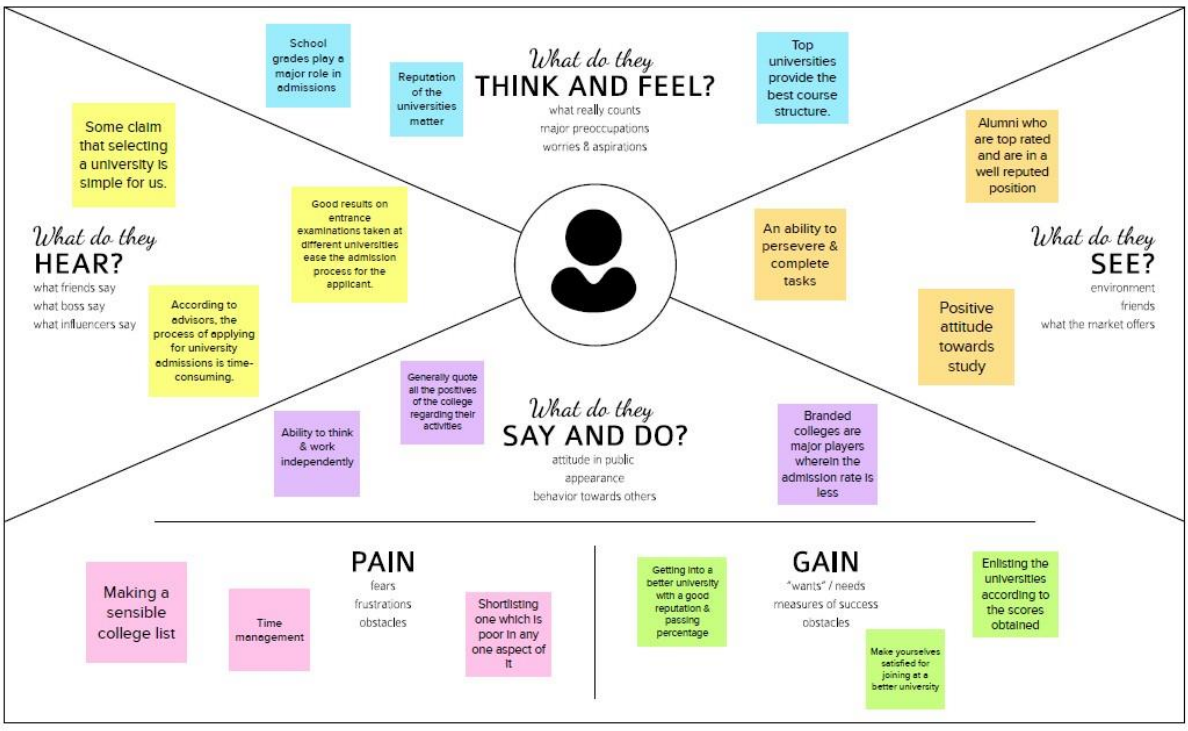
Concerns about getting into college are common among students. This project's goal is to assist students in narrowing down institutions based on their profiles. The anticipated results offer students a good indication of their prospects of admission to a certain university. This study ought to provide greater insight for students who are or will be preparing for exams.

III. IDEATION & PROPOSED SOLUTION:

3.1 Empathy map canvas

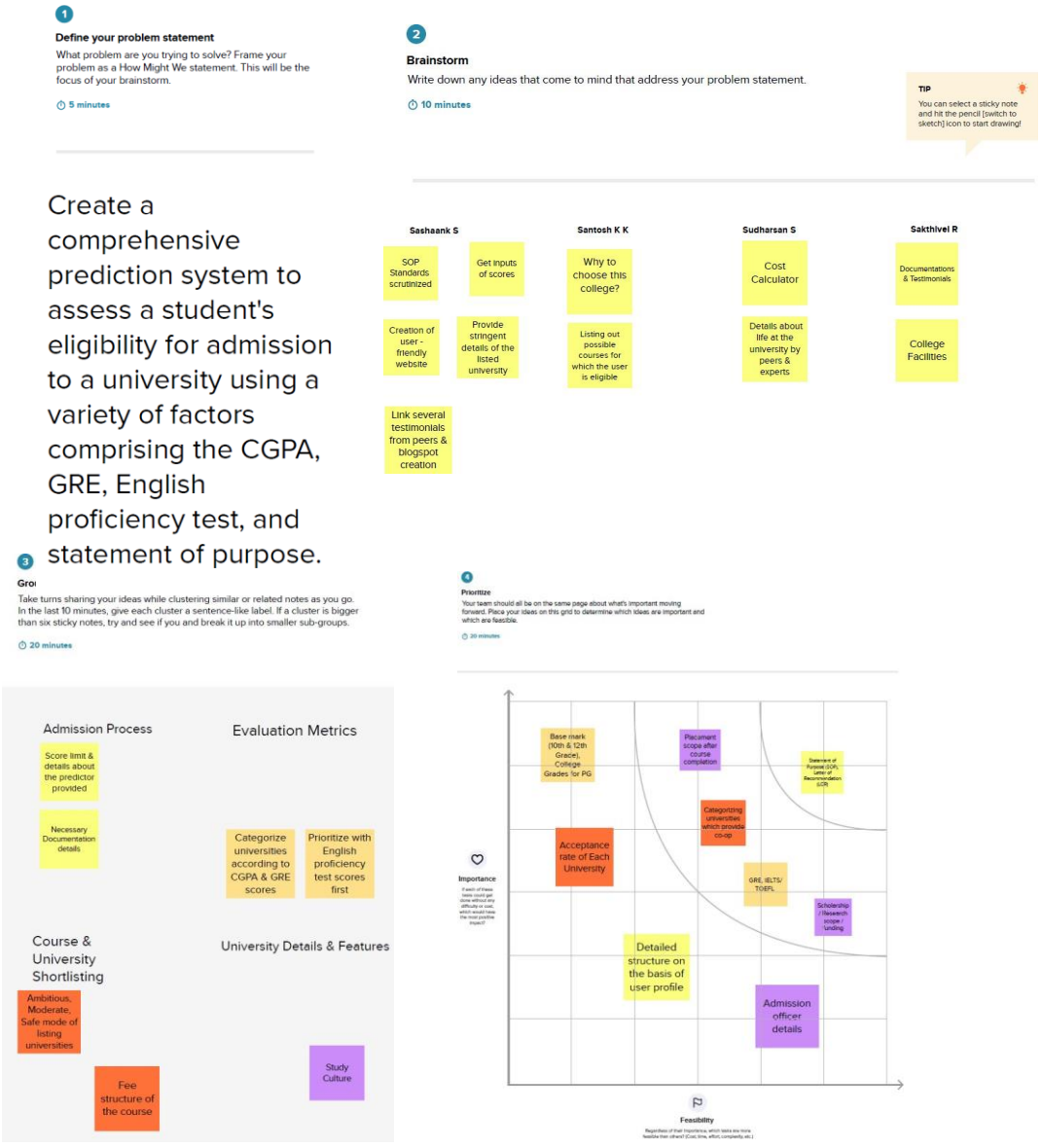
An empathy map is a straightforward, simple-to-understand picture that summarises information about a user's actions and views.

It is a helpful tool that enables teams to comprehend their users more fully. It's important to comprehend both the actual issue and the individual who is experiencing it in order to develop a workable solution. Participants learn to think about issues from the user's perspective, as well as his or her objectives and obstacles, via the process of constructing the map.



3.2 Ideation & Brainstorming

During a brainstorming session, everyone in a team is encouraged to engage in the process of original thought that results in issue solutions. Volume over quality is prioritised, unconventional ideas are welcomed and developed upon, and everyone is urged to participate in order to produce a wealth of original solutions.

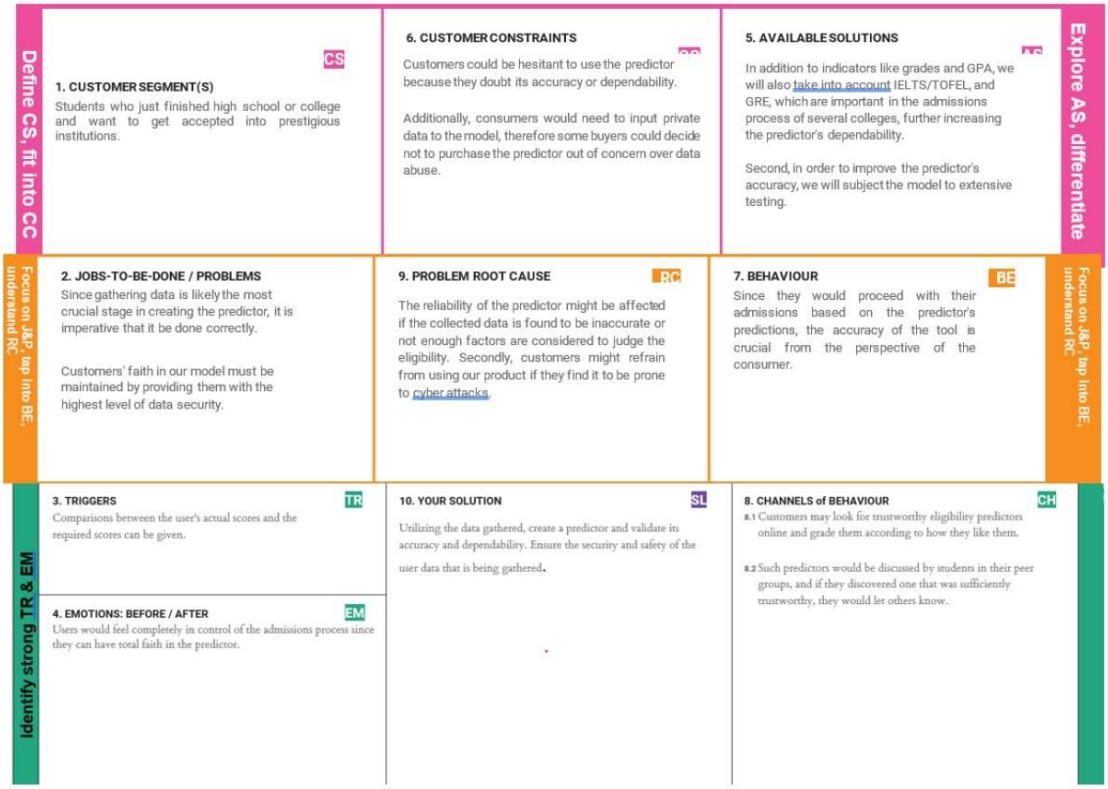


3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Education institutions use online applications for admissions and eligibility criteria based on marks, but there are no set procedures followed for predicting a student's admission to the university. Instead, they investigate and take measures to predict their eligibility for enrolling in the course.

2.	Idea / Solution description	We intend to put into practise an effective system for assessing a candidate's suitability for admission to a university.
3.	Novelty / Uniqueness	We look forward to mentioning a wide range of information about the university that the student is qualified to attend, including geographic data, cultural information, details about alumni, information about the university's top courses, admit percentage, job prospects after graduation, and peer reviews, which are additional features.
4.	Social Impact / Customer Satisfaction	By offering information directly from students who recently graduated from the university and guiding us toward courses that are relevant to our profiles, it makes it easier to use the website to enrol in the university.
5.	Business Model (Revenue Model)	It is offered for free.
6.	Scalability of the Solution	The more users there are, the easier it will be to collect input and work on system improvements. In turn, the model may be trained to make predictions more accurately based on the feedback.

3.4 Problem Solution Fit



IV. REQUIREMENT ANALYSIS:

4.1 Functional Requirements

Following are the functional requirements of the proposed solution**.**

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Details	Submit the paperwork • Score report for the GRE or TOEFL • Curriculum Vitae (CV) • Recommendation letter • Statement of Purpose (SoP)
FR-4	User Requirements	• Upload all necessary files to the proper area of the website. • Based on the uploads, the system would extract the necessary data. • A list of every probable university for the candidate would be shown based on the information that was scraped.

4.2 Non- Functional Requirements

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

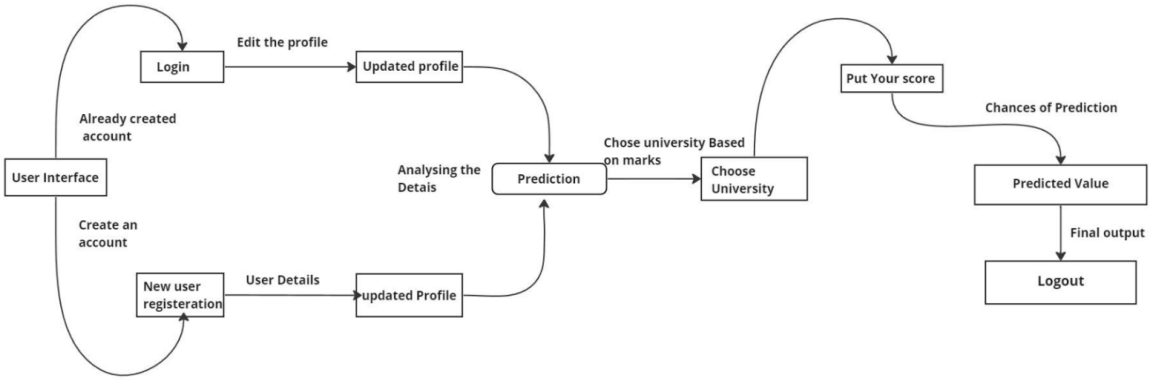
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	• Even a beginner user can access the system because it doesn't require any prior technological expertise from them. • The user interface would give recognition more weight than recall. • Friendly to users • Be aware of internal sources of control • The loading and display of the content wouldn't take too long (30 seconds). • The site's fields would be self-explanatory.
NFR-2	**Security**	• The site's services may only be accessed by authorised users. • Every hour, the database has to be backed up. • The system should be able to resume normal operation in less than an hour in the case of any errors.
NFR-3	**Reliability**	• Given the importance of the data and the potential damage • The damage that erroneous or inadequate data • System will constantly aim for the highest level of dependability. • The system will function every day of the week.

NFR-4	**Performance**	• The website may effectively manage traffic by quickly responding to queries. • This webpage may be seen in less than 30 seconds using a 64 kbps modem connection (quantitatively, the mean time)
NFR-5	**Availability**	Low data redundancy, lower danger of mistake, and quick and efficient
NFR-6	**Scalability**	• An academic portal is required for the courses that use it, therefore a large number of users must be able to use the system at once. • The system must be able to accommodate several users at once because the admissions season is likely to be its busiest time.

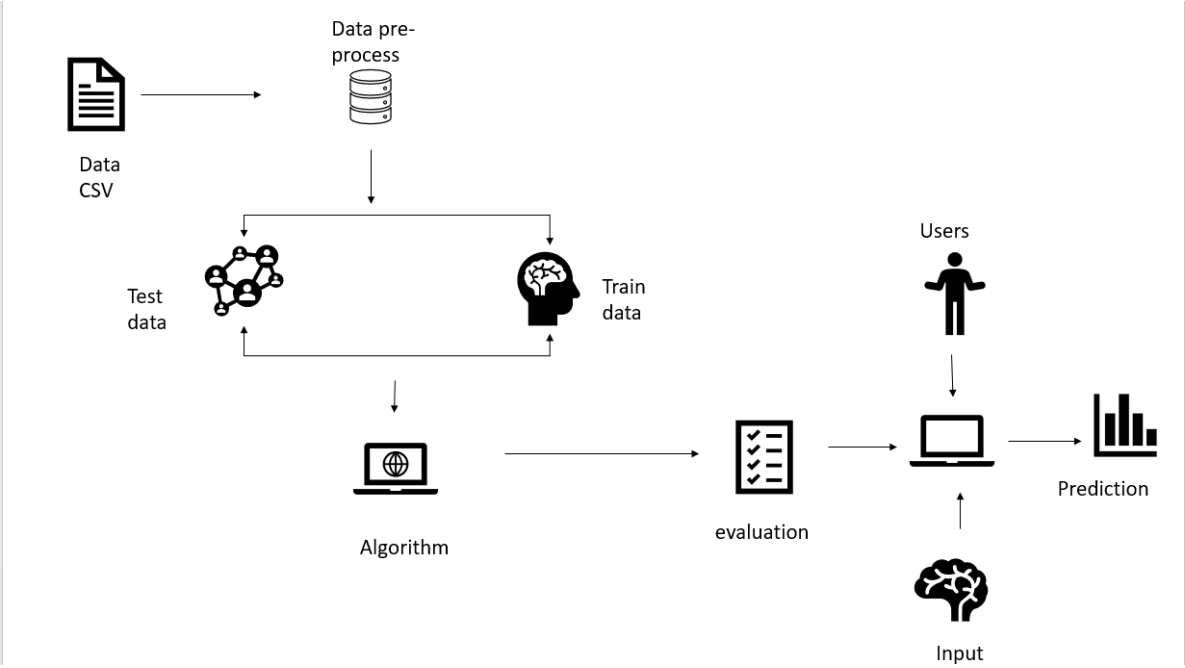
V. PROJECT DESIGN:

5.1 Data Flow Diagrams

The classic visual depiction of how information moves through a system is a Data Flow Diagram (DFD). A tidy and understandable DFD may visually represent the appropriate quantity of the system demand. It demonstrates how information enters and exits the system, what modifies the data, and where information is kept.



5.2 Solution & Technical Architecture



5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer	Homepage	USN-1	I can see information about the university as a user.	I can get to the school's home page.	Medium	Sprint-1
		USN-2	I may access the most recent university news as a user.	I have access to the most recent news.	Medium	Sprint-1
		USN-3	As a user, I can submit inquiries using the contact form.	I am able to complete and submit the contact form.	Low	Sprint-2
		USN-4	As a user, I have access to the university's social media profiles.	I may contact them through social media.	Medium	Sprint-1
		USN-5	As a user, I am able to view testimonials from university graduates.	I have access to the testimonies.	Medium	Sprint-1
	Admissions	USN-6	I can see the prior year's cut off markings as a user.	I may obtain the prior year's cut-off information.	High	Sprint-2
		USN-7	As a user, I may read about the university's proud alumni.	May obtain information on university alumni	Medium	Sprint-2
		USN-8	As a user, I can anticipate my eligibility for university entrance.	I can obtain either an eligible or ineligible result.	High	Sprint-2
	Courses Offered	USN-9	As a user, I may see the PG courses provided by the institution.	I have access to the course information.	Medium	Sprint-3
	Events	USN-10	As a user, I may view a list of upcoming technical events at the institution.	I can register for the events	Low	Sprint-3
	Scholarship	USN-11	As a user, I will look for information about scholarship opportunities.	I have access to scholarship resources.	High	Sprint-4
Administrator	Homepage	USN-12	As an administrator, I will keep the university's news up to date.	I can see if the update has been reflected or not.	Medium	Sprint-4
	Events	USN-13	As an administrator, I can change the list of activities that will be held.	I can see if the update has been reflected or not.	Medium	Sprint-4

VI. PROJECT PLANNING & SCHEDULING:

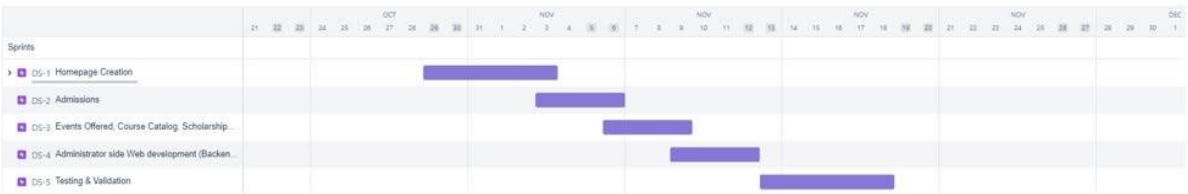
6.1 Sprint Planning & Estimation

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 confirmingmy password.	2	High	Vishal.B
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	Sharan.A
Sprint-1	Login	USN-3	As a user, I can log into the application by entering email & password	2	High	Nithish.S
Sprint-2	Dashboard	USN-4	As a user, I will provide my schooling information in the application	3	High	Vishal.B Sharan.A
Sprint-2		USN-5	As a user I will view the colleges which are under my criteria.	2	High	Nithish.S Vikash.S
Sprint-3		USN-6	As an Administrator I provide the eligibilitycriteria of the college for the students.	5	Medium	Sharan.A Vishal.B
Sprint-4		USN-7	As a user after checking my college details I can view the customer care phone number foraddition information.	5	Medium	Nithish.S

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	10	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	10	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	15	11 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	17 Nov 2022

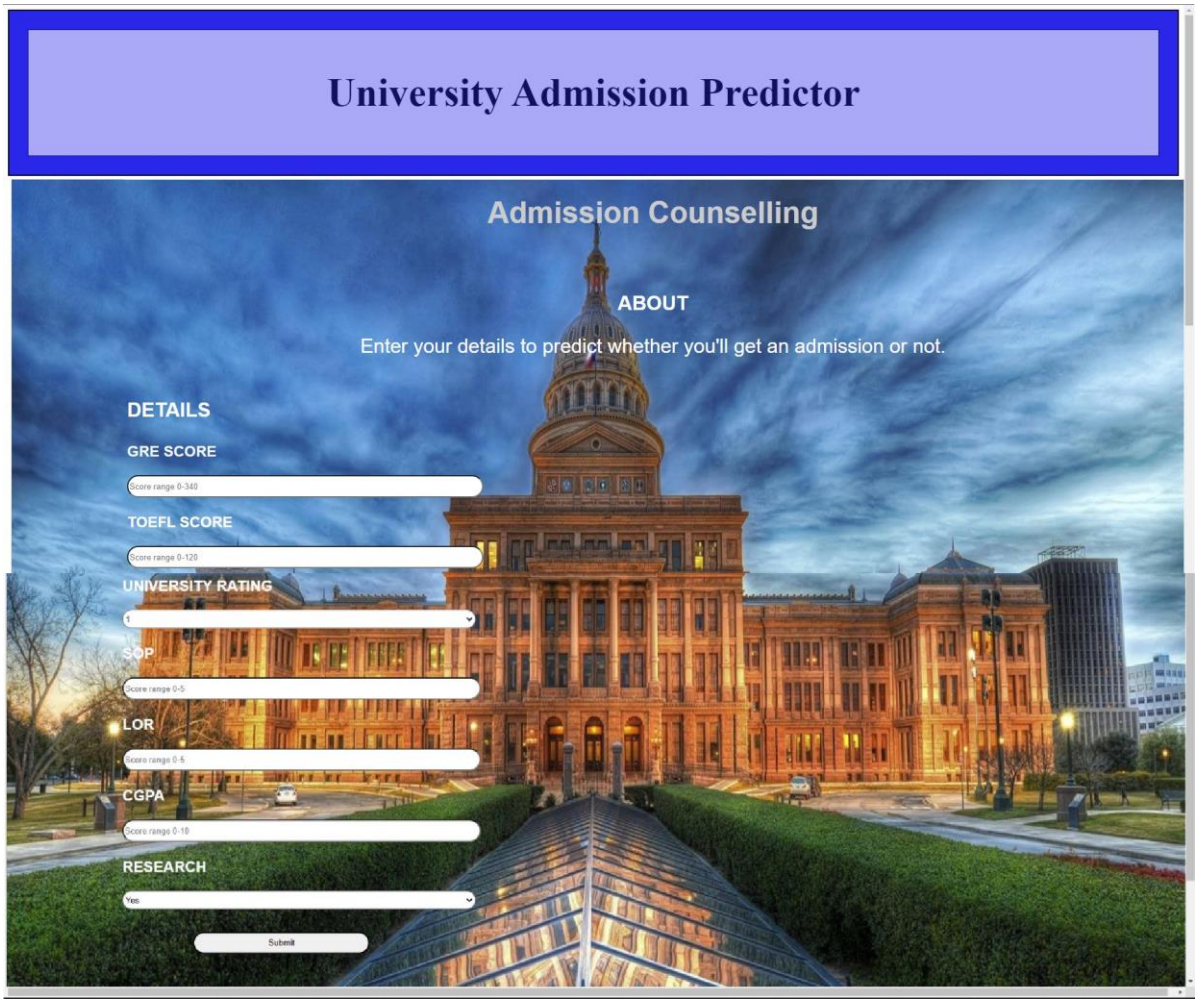
6.3 Reports from JIRA



VII. CODING & SOLUTIONING:

7.1 Feature 1

INDEX.HTML



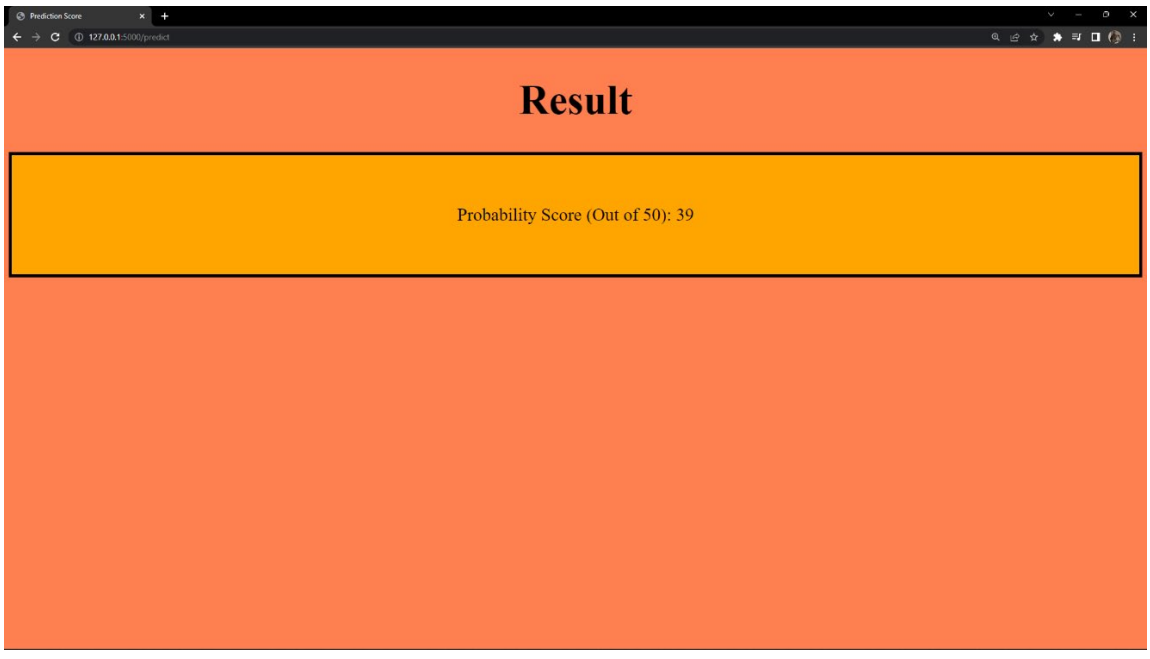
index.html Templates\index.html\...

```
<!DOCTYPE html>
<html lang="en" dir="ltr">
  <head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title> Responsive Registration Form </title>
    <link rel="stylesheet" href="style.css">
   </head>
   <style type="text/css">

    h1,h2{
      font-family: 'Raleway', sans-serif;
      color: black;
    }
    h2,h1,form,p,b{
      text-align: left;
      color: black;
    }
    label,p,b{
      font-family: 'Noto Sans HK', sans-serif;
      color: black;
    }
    .elements{
      padding-top: 2px;
    }
    div.background {

      /* background: url("C:\Users\santosh\OneDrive\Desktop\toro.jpg.crdownload") repeat; */
      background-size: auto;
      background-color: rgb(42, 39, 234);
      border: 2px solid black;
    }

    div.transbox {
      margin: 30px;
      background-color: #ffffff;
      border: 1px solid black;
      opacity: 0.6;
    }

    div.transbox p {
      margin: 5%;
      font-weight: bold;
      color: #000000;
    }
    div.gallery{
      margin: 5px;
      border: 1px solid #ccc;
      float: left;
      width:180px;

    }
```

```
index.html Templates\index.html\...
</style>
<body>
  <div class="background">
    <div class="transbox">
      <h3 style="font-size: 4rem; text-decoration-thickness: auto; position: -webkit-sticky; text-align: center;" >University Adm
    </div>
  </div>
  <div class="gallery">
      <img src ="static/images/bg.jpg" alt="Cinque Terre" width="1900" height="1600" />
    </a>
  </div>



  <h1 style="color: #ccc; font-size: 3rem;  text-decoration-style: auto; position: sticky;   text-align: center; text-decoratic
  <br>
  <br>
  <p style=" color:#ffffff; font-size: 2rem; font-family: 'Raleway', sans-serif; text-align: center;"> <strong> ABOUT </strong>
  <p style=" color:white; font-size:  2rem; font-family: 'Raleway', sans-serif; text-align: center;">Enter your details to prec

  <form action="/predict" method="POST" class="elements" style="font-size: 1rem;">
    <p style=" color:#ffffff;  font-size: 2rem; font-family: 'Raleway', sans-serif; "> <strong> DETAILS </strong></p>
    <p style="color:whitesmoke;font-size: 1.5rem; font-style: inherit; font-weight: bolder;" class="elements">GRE SCORE</p>
    <p><input type="text" name="gre" placeholder="Score range 0-340" style=" border-radius: 200px; height: 30px; width: 30%;" req
    <p style="color:#ffffff;font-size: 1.5rem; font-style: initial; font-weight: bolder;" class="elements">TOEFL SCORE</p>
    <p><input type="text; range" name="tofl" placeholder="Score range 0-120" min="50" max="120" style=" border-radius: 20px; heig
    <p style="color:#ffffff; font-size: 1.5rem; font-style: inherit; font-weight: bolder;"class="elements">UNIVERSITY RATING</p
    <select name="rating" style=" border-radius: 100px; height: 30px; width: 30%;" required>
      <option value="1">1</option>
      <option value="2">2</option>
      <option value="3">3</option>
      <option value="4">4</option>
      <option value="5">5</option>
        </select>
    <br>
    <p style=" color:#ffffff;font-size:  1.5rem; font-style: inherit; font-weight: bolder;" class="elements">SOP</p>
    <p><input type="text" name="sop" placeholder="Score range 0-5" style=" border-radius: 20px; height: 30px; width: 30%;" requir
    <p style=" color:#ffffff;font-size: 1.5rem; font-style: inherit; font-weight: bolder;" class="elements">LOR</p>
    <p><input type="text" name="lor" placeholder="Score range 0-5" style=" border-radius: 20px; height: 30px; width: 30%;" requir
    <p style=" color:#ffffff;font-size: 1.5rem; font-style: inherit; font-weight: bolder;"class="elements">CGPA</p>
    <p><input type="text" name="cgpa" placeholder="Score range 0-10" style=" border-radius: 20px; height: 30px; width: 30%;" requ
    <p class="elements" style=" color:#ffffff;font-size: 1.5rem; font-style: inherit; font-weight: bolder;">RESEARCH</p>
    <select name="research" style=" border-radius: 100px; height: 30px; width: 30%;" required>
      <option value="Yes">Yes</option>
      <option value="No">No</option>
        </select>
        <br>
        <br>
        <br>
        <input type="submit" value="Submit" style=" border-radius: 40rem; height: 35px; width:15%; margin-left:6%;"></p>


</body>
</html>
```

7.2 Feature 2

RESULT.HTML



result.html Templates\result.html\ html\ html\ body\ div.center\ div.results\ p.result-p

```
<!DOCTYPE html>
<html>
  <html lang="en" dir="ltr">
    <head>
    <link rel="stylesheet" href="style.css">
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title> Prediction Score</title>
<style>
.center {
  display: flex;
  justify-content: center;
  align-items: center;
  height: 200px;
  border: 5px solid  black;
  background-color:  orange;
}
p {
  font-size: 30px;
}
body{
   background-color: coral;
}
</style>
</head>
<body>
<h1 style="font-size: 70px; text-decoration-thickness: auto; position: -webkit-sticky; text-align: center;" >Result</h1>
<div class="center">
  <div class="results">
    <p class='result-p'>Probability Score (Out of 50): {{ lower_limit }}</p>
</div>
</div>
</body>
</html>
```

FLASK FILE TO INTEGRATE WEBSITE (app.py):

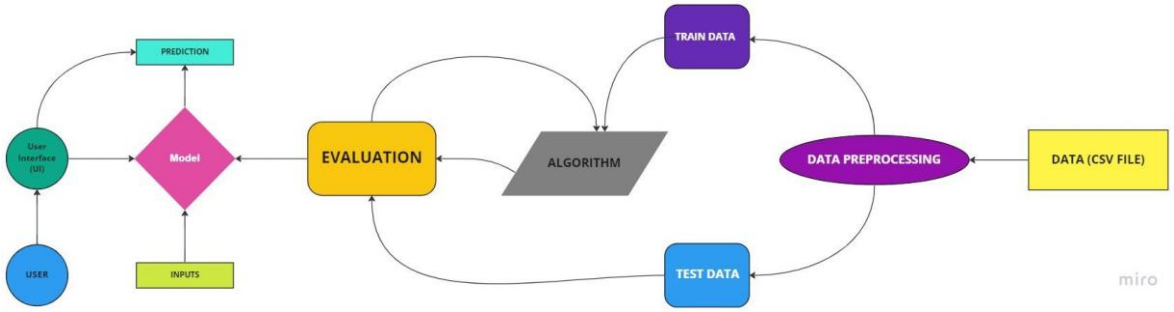
app.py

app.py > predict

```
import numpy as np
import os
import requests
from flask import Flask, request, render_template, redirect, url_for
import pickle
# from cloudant.client import Cloudant

filename = 'Linear_Regression.pkl'

regressor = pickle.load(open(filename, 'rb'))

# NOTE: you must manually set API_KEY below using information retrieved from your IBM Cloud account.
API_KEY = "zVsoaE6d4nyR7hKtiXZi19ElXPmpHmrbXIB3mzjI3UcE"
token_response = requests.post('https://iam.cloud.ibm.com/identity/token', data={"apikey": API_KEY, "grant_type": 'urn:ibm:params:oauth:grant-type:apikey'})
mltoken = token_response.json()["access_token"]

header = {'Content-Type': 'application/json', 'Authorization': 'Bearer ' + mltoken}

app = Flask(__name__)

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

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

    if request.method == 'POST':
        #gre_score = request.form["gre"]
        #toefl_score = request.form["tofl"]
        #university_rating = request.form["rating"]
        #sop = request.form["sop"]
        #lor = request.form["lor"]
        #cgpa = request.form["cgpa"]
        #research = request.form["research"]

        gre_score = int(request.form["gre"])
        toefl_score = int(request.form["tofl"])
        university_rating= int(request.form["rating"])
        sop = float(request.form["sop"])
        lor = float(request.form["lor"])
        cgpa = float(request.form["cgpa"])
        research = request.form["research"]
        payload_scoring = {"input_data": [{"field": ["GRE Score", "TOEFL Score", "University Rating", "SOP", "LOR", "CGPA", "Research", "Chance of Admit"], "values": [[gre_score, toefl_sc
        response_scoring = requests.post('https://us-south.ml.cloud.ibm.com/ml/v4/deployments/eede2024-9b01-4f89-8f2b-9d0cb309fae0/predictions?version=2022-11-17', json=payload_scoring,
        headers={'Authorization': 'Bearer ' + mltoken})
        print("Scoring response")
        predictions = response_scoring.json()
        print(predictions)
        pred = predictions['predictions'][0]['values'][0][0]
        print(gre_score)
```

```python
#cgpa = request.form["cgpa"]
#research = request.form["research"]

gre_score = int(request.form["gre"])
toefl_score = int(request.form["tofl"])
university_rating= int(request.form["rating"])
sop = float(request.form["sop"])
lor = float(request.form["lor"])
cgpa = float(request.form["cgpa"])
research = request.form["research"]
payload_scoring = {"input_data": [{"field": ["GRE Score", "TOEFL Score", "University Rating", "SOP", "LOR", "CGPA", "Research", "Chance of Admit"], "values": [[gre_score, toefl_s
response_scoring = requests.post('https://us-south.ml.cloud.ibm.com/ml/v4/deployments/eede2024-9b01-4f89-8f2b-9d0cb309fae0/predictions?version=2022-11-17', json=payload_scoring,
headers={'Authorization': 'Bearer ' + mltoken})
print("Scoring response")
predictions = response_scoring.json()
print(predictions)
pred = predictions['predictions'][0]['values'][0][0]
print(gre_score)
print(toefl_score)
print(university_rating)
print(sop)
print(lor)
print(cgpa)

temp_array = temp_array + [gre_score, toefl_score, university_rating, sop, lor, cgpa]
data = np.array([temp_array])
print(data)
print(temp_array)
my_prediction = int(regressor.predict(data)[0])
print(my_prediction)
return render_template('result.html',lower_limit=my_prediction)

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

7.3 Database Schema



VIII. TESTING:

8.1 Test Cases

Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status
LoginPage_TC_OO2	UI	Index	Verify the UI elements in home page		1.Enter URL and click go 2.Enter the Scores 3.Click the Submit button	http://127.0.0.1:5000/home	Working as expected	Working as expected	Pass
LoginPage_TC_OO3	Functional	Chance	Verifying whether the student is eligible for admission		1.As per the Entered Model Value. 2.Getting above 50%. 3.You have a Chance will get displayed	http://127.0.0.1:5000/chance/90.1742255758468	Working as expected	Working as expected	Pass
LoginPage_TC_OO4	Functional	NoChance	Verifying whether the student does not have a chance of admission		1. As per the Entered Model Value. 2. Getting below 50% 3. You have a Low/Nochance will get displayed	http://127.0.0.1:5000/nochance/41.52682121752442	Working as expected	Working as expected	Pass

8.2 User Acceptance Testing

The purpose of User Acceptance Testing is to briefly explain the test coverage and open issues of the University Admit Eligibility Predictor project at the time of the release to User Acceptance Testing (UAT).

8.2.1 Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	10	4	2	3	20
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	11	2	4	20	37
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	2	1	8
Totals	24	14	13	26	77

8.2.2 Test Case Analysis

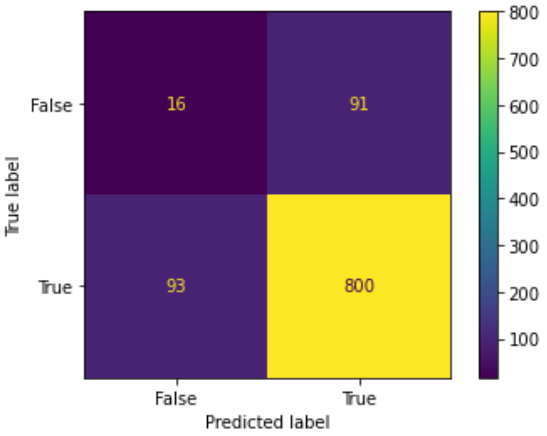
This report shows the number of test cases that have passed, failed, and untested

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	7	0	0	7
Client Application	45	0	0	45
Security	2	0	0	2
Outsource Shipping	3	0	0	3
Exception Reporting	9	0	0	9
Final Report Output	4	0	0	4
Version Control	2	0	0	2

IX. RESULTS:

9.1 Performance Metrics

S.No.	Parameter	Values	Screenshot

1.	Metrics	**Regression Model:**
		MAE - , 0.04555
		MSE - , 0.00426
		RMSE – 0.06527 ,
		R2 score – 0.71683
		Classification Model:
		Confusion Matrix -
		Accuracy Score-
		Classification Report -
			Mean Squared Error (MSE)
			In [25]:
			`from sklearn.metrics import mean_squared_error, r2_score`
			`mse = mean_squared_error(pred_test,y_test)`
			In [26]: `mse`
			Out[26]: `0.004260810050671112`
			Root Mean Squared Error (RMSE)
			In [27]: `rmse = np.sqrt(mse)`
			In [28]: `rmse`
			Out[28]: `0.06527488070208257`
			R2 Score
			In [29]: `r2_score(pred_test, y_test)`
			Out[29]: `0.7168318679092451`
			Mean Absolute Error (MAE)
			In [32]:
			`from sklearn.metrics import mean_absolute_error`
			`mean_absolute_error(pred_test, y_test)`
			Out[32]: `0.0455524319663054`
			 
			In [44]:
			`Accuracy = metrics.accuracy_score(actual, predicted)`
			`Accuracy`
			Out[44]: `0.816`
			Classification Report
			In [56]:
			`from sklearn.metrics import classification_report`
			`print(classification_report(actual, predicted))`
			precision recall f1-score support
			0 0.15 0.15 0.15 107
			1 0.90 0.90 0.90 893
			accuracy 0.82 1000
			macro avg 0.52 0.52 0.52 1000
			weighted avg 0.82 0.82 0.82 1000

2.	Tune the Model	Hyperparameter Tuning- Validation Method – Stratified K-Fold	**2.Stratified K-Fold**
			In [63]:
			`from sklearn import datasets`
			`from sklearn.tree import DecisionTreeClassifier`
			`from sklearn.model_selection import StratifiedKFold, cross_val_score`
			`X, y = datasets.load_iris(return_X_y=True)`
			`clf = DecisionTreeClassifier(random_state=42)`
			`sk_folds = StratifiedKFold(n_splits = 5)`
			`scores = cross_val_score(clf, X, y, cv = sk_folds)`
			`print("Cross Validation Scores: ", scores)`
			`print("Average CV Score: ", scores.mean())`
			`print("Number of CV Scores used in Average: ", len(scores))`
			Cross Validation Scores: [0.96666667 0.96666667 0.9 0.93333333 1.]
			Average CV Score: 0.9533333333333334
			Number of CV Scores used in Average: 5

X. ADVANTAGES & DISADVANTAGES

Advantages

- It helps student for making decision for choosing a right college.
- Here the chance of occurrence of error is less when compared with the existing system.
- It is fast, efficient and reliable.
- Avoids data redundancy and inconsistency.
- Very user-friendly.
- Easy accessibility of data.

Disavantages:

- Required active internet connection.
- System will provide inaccurate results if data entered incorrectly.

XI. CONCLUSION

Thus it is concluded that our model provides a robust prediction score with Multiple Linear Regression Algorithm & users are able to predict the scores what they expected. User experience of the website is a simple one to use & puts the user at ease to utilize the feature.

XII. FUTURE SCOPE

We intend to enhance the user experience by adding the details of every universities so that the user can get to know the culture of the place, alumni reviews, rating of the universities etc.

XIII. APPENDIX

Github : **https://github.com/IBM-EPBL/IBM-Project-13852-1659533411**