UNIVERSITY ADMIT ELIGIBILITY PREDICTOR

(TEAM ID : PNT2022TMID31830)

Nalaiya Thiran project based learning on Professional readlines for innovation,employment and entrepreneurship

A PROJECT REPORT

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In partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

KARPAGAM INSTITUTE OF TECHNOLOGY

COIMBATORE-641105

NOV 2022

ABSTRACT

At the time of admission all the work is done by manually by ink and paper, that is very slow and much time and effort consuming. Students admission is one of the most important activities in education industry. A poor and slower admission system can mean fewer students being admitted into abroad universities because they don't have proper source to do the process. This project aims for automated system, pre checking the inclusions of all required data and automatically listing each student based on their application. The data used by the system is stored by database that will be center of all information. This enables things to be simplified and considerably quick, making it easier. It supports the current process but centralized it and make it possible for abroad universities.

INDEX

s.no	Title	Page no
1.	Introduction	4
1.1	Project Overview	5
1.2	Purpose	5
2	LITERATURE SURVEY	6
2.1	Existing Problem	6
2.2	References	7
2.3	Problem Statement Definition	7
3	IDEATION & PROPOSED SOLUTION Empathy Map	8
3.1	Canvas	8
3.2	Ideation & Brainstorming	9
3.3	Proposed Solution	9
3.4	Problem Solution Fit	11
4	REQUIREMENT ANALYSIS	12
4.1	Functional Requirement Non-Functional	12
4.2	Requirement	12
5	PROJECT DESIGN	13
5.1	Data Flow Diagram	13
5.2	Solution & Technical Architecture User Stories	14
6	PROJECT PLANNING & SCHEDULING	15
6.1	Sprint Planning & Estimation	15
6.2	Sprint Delivery Schedule	15
6.3	Report to JIRA	16
7	CODING & SOLUTIONING	16
7.1	Code	16
7.2	Features	18
7.3	Algorithm	18
8	Testing	19
9	Results	20
10	ADVANTAGES & DISADVANTAGES	22
11	CONCLUSION	23
12	FUTURE SCOPE	23
13	APPENDIX	23

CHAPTER 1
INTRODUCTION

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. Every candidate has to take all the required examination and build a strong profile to secure admission in their dream universities. The students have to shortlist the universities which are best known for the courses they are looking for and also, they should have an idea about their chances of securing admission in those universities based on their profile. This task of shortlisting the universities where the student has high chances of admission is difficult for mainly for the international students, so they end up with applying to many universities in hopes of getting admission in few of them thus investing an extra amount of money in the applications. There are several portals and websites which provide information and help to students in shortlisting the universities, but they are not reliable. Most of the students 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 student have to pay a huge amount of fee to the education consultant. The primary objective of this research is to develop a system to solve the problems the international students are facing while applying for universities. This 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 scores. Multiple machine learning classification algorithms were evaluated to develop the system. Also, we will be creating a simple user interface which will help the users to input the data related to student profile and get the predicted result for the application based on the profile as output. This research will thus eventually help students saving the extra amount of time and money they have to spend at the education consultancy firms. And also, it will help them to limit their number of application to a small number by proving them the suggestion of the universities where they have the best chance of securing admission.

1.1 Project Overview

University and college admission is a complex decision process that goes beyond simply matching test scores and admission requirements. For an aspiring graduate student, choosing which universities to apply to is really a difficult problem. Often, the students wonder if their profile is good enough for a certain university. In this project, this problem has been addressed by modeling a recommender system based on various classification algorithms. Based on the collected data set, various models were trained and one best and some other similar properties carrying universities are suggested for the students such that it maximizes the chances of a student getting an admit from that university list. Classification algorithms have also been used to predict the acceptance chance of any student on any individual university. To predict the best university for the particular student his/her TOEFL score, GRE score, their university ratings, the SOP score, LOR score and their CGPA, the score has been used as attributes for classification. Linear regression algorithm has been used to predict the eligibility chances for them to get admission

1.2 Purpose

Students are often worried about their chances of admission to university. The aim of the 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.

CHAPTER 2
LITERATURE SURVEY

1. Prediction for university admission using machine learning,2020.

Authors:

Chithra Apoorva D A, Malepati Chandu Nath, Peta Rohith, Bindu Shree.S. This research paper refers to discuss the prediction of student admission to university based on numerous factors and using logistic regression. Many prospective students apply for Master'sprograms. The admission decision depends on criteria within the particular college or degree program. The independent variables in this study will be measured statistically to predict graduate school admission. Exploration and data analysis, if successful, would allow predictive models to allow better prioritization of the applicants screening process to Master's degree program which in turn provides the admission to the right candidates.

2. University Admission Prediction using Machine Learning, 2021.

Authors:

Kruthika CS, Apeksha B, Chinmaya GR, Madhumathi JB, Veena MR. This research paper talk about is to make a Machine Learning model which could be utilized by understudies who need to seek after their education. Many AI algorithms were used for this examination. Linear Regression model contrasted with different models gives the best outcome. Understudies can utilize the model to survey their shots at getting induction into a specific University.

3. Graduate Admission Prediction Using Machine Learning,2020.

Authors:

Sara Aljasmi , Ali Bou Nassif ,Ismail Shahin, Ashraf Elnagar. This research paper talk about machine learning models were performed to predict the opportunity of a student to get admitted to a master's program. The machine learning models included are multiple linear regression, k-nearest neighbours, random forest, and Multilayer Perceptron. Experiments show that the Multilayer Perceptron model surpasses other models. As for the future work, more models can be conducted on more datasets to learn the model that gives the best performance.

4. Prediction of Admission Process for Gradational Studies using AI Algorithm,2021.

Authors:

Saurabh Singhal, Ashish Sharma. In the present time there are plenty of scholars seeking after their instruction away from their nations of origin. The fundamental nation focused through these worldwide scholars is The United States of America. The popular of the universal scholars in the United States of America are from India and China. With the expansion in the quantity of worldwide scholars concentrating in the USA, every candidate needs to confront extreme rivalry to get admission to their fantasy college. This work is to build up a framework utilizing AI algorithms, named it as Graduate Admission Prediction (GAP). GAP will assist the scholars by predicting the chance to get seat in Fantasy College. This paper compares and recognizes which AI algorithm is going to give precise outcome. A straightforward UI will be created for clients to get to the framework.

2.1 Existing Problem

When the user wants to know whether he/she is eligible for getting admission in the universities. They need to visit the universities personally and get their previous cut off records. Then the user needs to analyse those records to know their chance of admit. It takes a lot of time and energy and the prediction will also be inaccurate. The proposed system will be able to overcome these shortcomings and gives the chance of admit for the user.

2.2 References

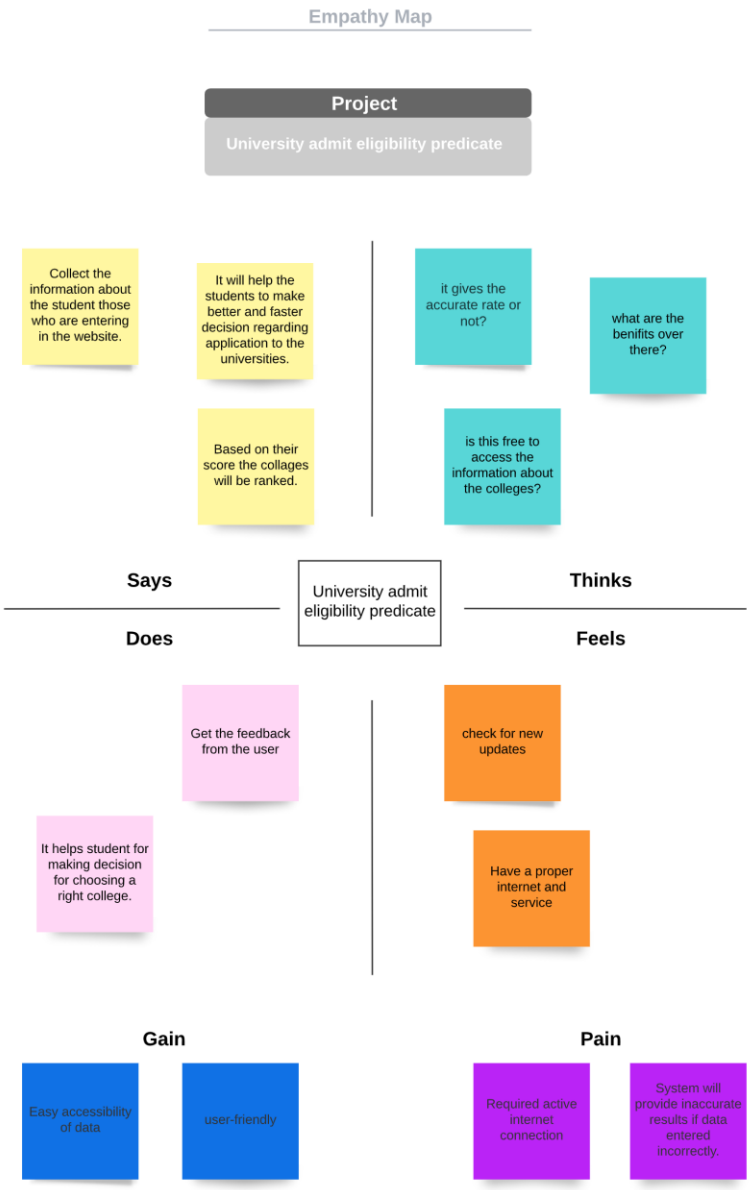
1. Chithra Apoorva D A, Malepati ChanduNath, Peta Rohith, Bindu Shree.S; Prediction for university admission using machine learning ,2020.
2. Kruthika CS, Apeksha B, Chinmaya GR, Madhumathi JB, Veena MR; University Admission Prediction using Machine Learning, 2021.
3. Sara Aljasmi , Ali Bou Nassif ,Ismail Shahin,Ashraf Elnagar; Graduate Admission Prediction Using Machine Learning,2020.
4. Saurabh Singhal, Ashish Sharma; Prediction of Admission Process for Gradational Studies using AI Algorithm,2021.
5. Sharan Kumar Paratala Rajagopal; Predicting Student University Admission Using Logistic Regression,2020.

2.3 Problem Statement

Definition Educational organizations have always played an important and vital role in society for development and growth of any individual. The problem statement, hence being tackled, is to design a university prediction system which helps students avoid spending time and money on counsellor and stressful research related to finding a suitable university. We aim to develop and provide a place which would give a probabilistic output as to how likely it is to get into a university given upon their details.

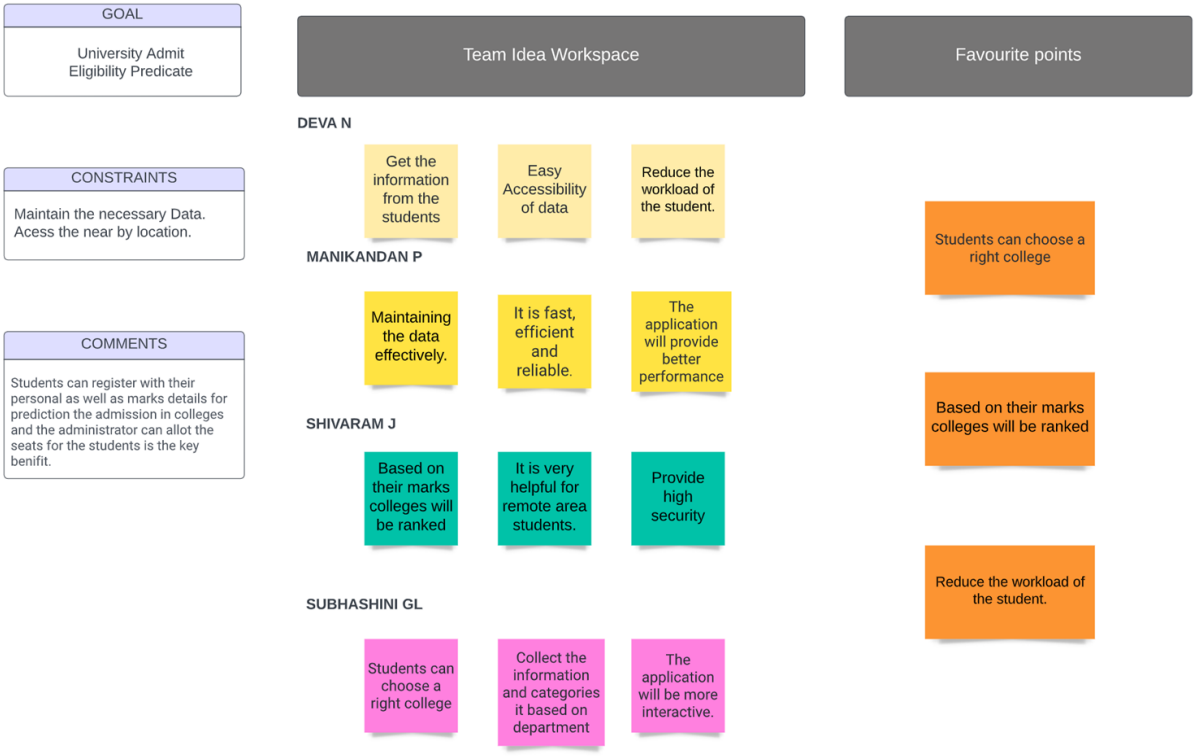
CHAPTER 3
IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



An empathy map is a collaborative tool teams can use to gain a deeper insight into their customers. Much like a user persona, an empathy map can represent a group of users, such as a customer segment. The empathy map has gained much popularity within the agile community.

3.2 Ideation & Brainstorming

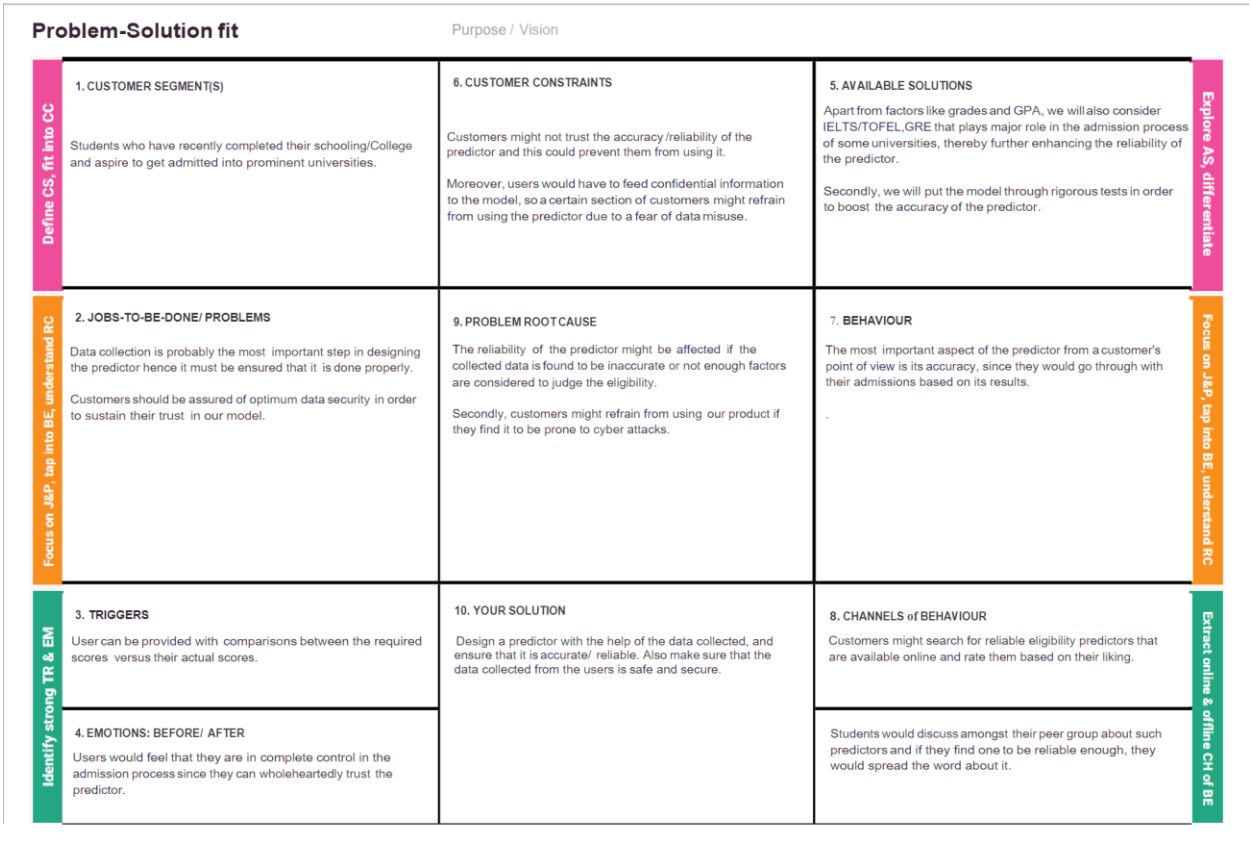


3.3 Proposed Solution

s.no	Parameter	Description
1.	Problem Statement (Problem to be solved)	Choosing the right universities or colleges is definitely a student have to face. Many students apply for the universities in which they have little chance of acceptance. This leads students of poor economic backgrounds to frustration and anxiety as they only lose surplus amount of money just for applying to those universities.
2.	Idea / Solution description	University and College research being one part of the university application process is itself an arduous and lengthy task. This issue being a big problem for students have not been solved till now. There are recognized sites which filters the best universities and colleges based on the location, tuition fees, major and degree but none of them have use machine learning algorithm to solve the issue. Hence, we have done this research project to solve that issue to some extent with the use of data mining techniques.

3.	Novelty / Uniqueness	University Application process itself being a tedious task Students needs lots of endeavour and determination for completing overall application process. It would definitely be easier for students if they get relief from step of selecting best suited universities and colleges for application.
4.	Social Impact / Customer Satisfaction	Results of this project are not applicable to college graduates of each and every major. As there was limitation of information on dataset this system could not predict and recommend universities to students of every major. Nevertheless, the statistical data mining techniques used in this project can be applicable to all majors. If any universities have insufficient data on the major chosen by the student it will return insufficient data for prediction to the user.
5.	Business Model (Revenue Model)	The required data was obtained from thegradcafe.com. Based on this data set, various models were trained and one best and some other similar properties carrying universities are suggested for the students such that it maximizes the chances of a student getting an admit from that university list.
6.	Scalability of the Solution	In this project, this problem has been addressed by modelling a recommender system based on various classification algorithms. To predict the best University for the particular student his/her GPA score, GRE (Verbal and Quant) Score, TOEFL score has been used as attributes for classification. K nearest neighbour has been used to predict best University and K means clustering has been used to find more similar universities. Support Vector Machine and Random Forest has been used to predict the admission chance of particular student on specific University.

3.4 Problem Solution Fit



CHAPTER 4
REQUIREMENT ANALYSIS

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 toidentified business needs or opportunities, and defined to a level of detail sufficient for system design.

4.1 Functional Requirements:

Functional requirements explain what has to be done by identifying the necessary task, action or activity that must be accomplished.
Functional requirements analysis will be used as the top-level functions for functional analysis.

- **Prediction**
  The system will predict whether the user is eligible for getting admission in the universities based on the scores.
- **Chance of Admit**
  The system shows the chance percentage of getting admission in the universities to the user.

4.2 Non-Functional Requirements

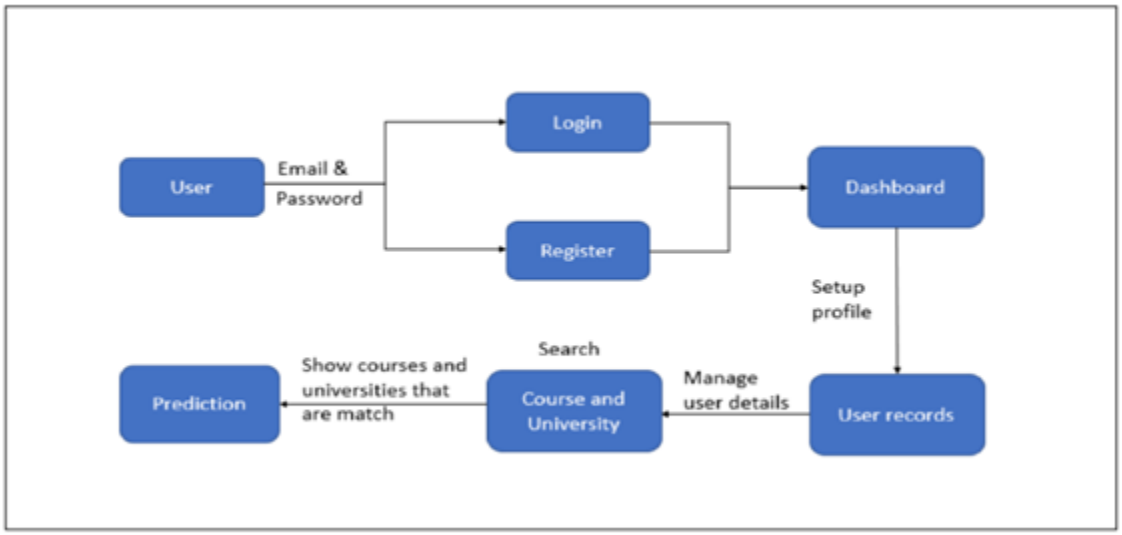
Non-functional requirements are requirements that specify criteria that can be used to judge the operation of a system, rather than specific behaviours.

- **Reliability**
  The system shall be completely operational all hours of the day unless system failure. Down time is not less than 24 hours.
- **Performance**
  The system can support any number of users at a time.
- **Supportability**
  The system will be able to incorporate more features without major reengineering.
- **Usability**
  No training is required to use the website. The results from the predictor should not take more than 30 seconds.

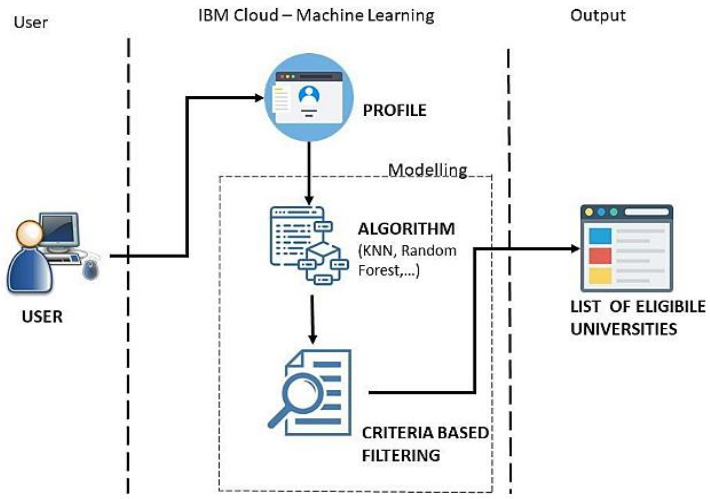
CHAPTER 5

5.1 Data Flow Diagram PROJECT DESIGN

A Data Flow Diagram (DFD) is a visual representation of the information flows within a system. It can be manual, automated, or a combination of both.



5.2 Solution & Technical Architecture



5.3 User Stories

A user story is a note that captures what a user does or needs to do as part of his/her work. Each user story consists of a short description written from user's point of view, with natural language.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application.	I can receive confirmation email & click confirm	Medium	Sprint-1
		USN-3	As a user, I can register for the application through Gmail.		Medium	Sprint-1
	Login	USN-4	As a user, I can log into the application by entering email & password.		High	Sprint-2
	Dashboard	USN-5	As a user, I can access my dashboard.	I can access my account / dashboard	High	Sprint-2
	Input	USN-6	As a user, I can setup the profile and basic details. I can enter my marks, qualifications and other requirements.	I can enter my details/requirements	High	Sprint-3
Customer care Executive	Customer care	USN-7	As an executive, I can solve the queries and issues.	I can give my support.	Low	Sprint-3
Administration	Application	USN-8	As an administrator, I can upgrade or update the application.	I can modify and improve the application.	High	Sprint-4

CHAPTER 6
PROJECT PLANNING & SCHEDULING

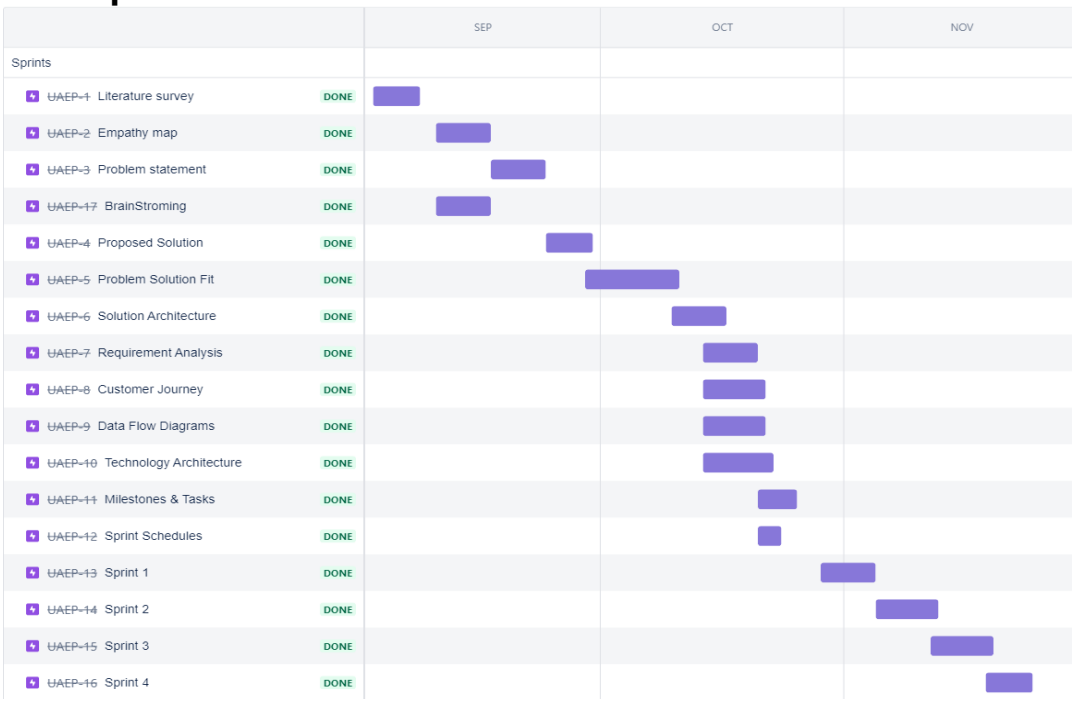
6.1 Sprint Planning & Estimation

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.	10	High	All
Sprint-2	Login	USN-3	As a user, I can login with my credential and geta personalized dashboard.	5	Low	All
Sprint-3	prediction	USN-5	As a user, I can provide my scores for prediction.	10	High	All
Sprint-4	preferences	USN-6	As a user, I can select and filter results basedon my preferences.	20	High	All

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	15	6 Days	24 Oct 2022	29 Oct 2022	15	29 Oct 2022
Sprint-2	15	6 Days	31 Oct 2022	05 Nov 2022	15	05 Nov 2022
Sprint-3	10	6 Days	07 Nov 2022	12 Nov 2022	10	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

6.3 Reports from JIRA



CHAPTER 7
CODING & SOLUTIONING

Code:

```
from flask import Flask, render_template, redirect, url_for, request
import requests
app = Flask(__name__)
@app.route("/", methods = ['POST', 'GET'])
def index():
    if request.method == 'POST':
        arr = []
        for i in request.form:
            val = request.form[i]
            if val == '':
                return redirect(url_for("demo2"))
            arr.append(float(val))
        # deepcode ignore HardcodedNonCryptoSecret: <please specify a reason of ignoring this>
        API_KEY = "LCI3WnVbNVVVk0zSyCGIBhWp0voyjeb5VzA1GuzPSEyl"
        token_response = requests.post('https://iam.cloud.ibm.com/identity/token', data={
            "apikey": API_KEY,
```

```
        "grant_type": 'urn:ibm:params:oauth:grant-type:apikey'
        })
    mltoken = token_response.json()["access_token"]
    header = {'Content-Type': 'application/json', 'Authorization': 'Bearer ' + mltoken}
    payload_scoring = {
      "input_data": [{"fields":[  'GRE Score',
                      'TOEFL Score',
                      'University Rating',
                      'SOP',
                      'LOR ',
                      'CGPA',
                      'Research'],
                "values": [arr]
                }]
              }

    response_scoring = requests.post(
      'https://us-south.ml.cloud.ibm.com/ml/v4/deployments/fd146f26-1deb-49a9-a688-
731daa863097/predictions?version=2022-11-16',
      json=payload_scoring,
      headers=header
    ).json()
result = response_scoring['predictions'][0]['values']

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

@app.route("/home")
def demo2():
  return render_template("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 __name__ == "__main__":
    app.run()
```

7.1 Features

Login Page

The login page allows a user to gain access to an application by entering the username and password. If the authentication is successful, the user is directed to the next page.

Enter Details

In this page, the user can enter their exam scores such as GRE score, TOEFL score, SOP score, LOR score, university ranking, CGPA and by clicking the predict button they will be redirected to the result page.

Result Page

This page displays the percentage of user's chance of getting admission in a university.

7.2 Algorithm

There are many algorithms for predictive modeling machine learning such as Linear regression, Support vector regression, Decision tree regression, Random Forest, XG Boost. Among these algorithms, Linear regression, Random Forest, XG Boost are evaluated. The evaluated results showed that the Linear regression is the most suitable machine learning for university admit eligibility prediction.

Linear Regression:

It is the most important algorithm in the field of Machine Learning, especially supervised learning. It is a way to model a relationship between a dependent variable and one or more independent variables. It consists of finding a regression line straight line through the points.

8. TESTING

8.1 Test Cases

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	51	0	0	51
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

Test case ID	Feature Type	Component	Test Scenario	Steps To Execute	Test Data	Expected Result	Actual Result	Status
LoginPage_TC_OO1	Functional	Home Page	Verify user is able to see the Login/Signup popup when user clicked on My account button	1.Enter URL and click go 2.Click on My Account dropdown button 3.Verify login/Singup popup displayed or not	http://127.0.0.1:5000	Login/Signup popup should display	Working as expected	Pass
LoginPage_TC_OO2	UI	Home Page	Verify the UI elements in Login/Signup popup	1.Enter URL and click go 2.Click on My Account dropdown button 3.Verify login/Singup popup with below UI elements: a.email text box b.password text box c.Login button d.New customer? Create account link e.Last password? Recovery password link	http://127.0.0.1:5000	Application should show below UI elements: a.email text box b.password text box c.Login button with orange colour d.New customer? Create account link e.Last password? Recovery password link	Working as expected	Fail
LoginPage_TC_OO3	Functional	Home page	Verify user is able to log into application with Valid credentials	1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter Valid username/email in Email text box 4.Enter valid password in password text box 5.Click on login button	Username: user1 password: 1234	User should navigate to user account homepage	Working as expected	Pass
LoginPage_TC_OO4	Functional	Login page	Verify user is able to log into application with InValid credentials	1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter Valid username/email in Email text box 4.Enter Invalid password in password text box 5.Click on login button	Username: user1 password: 123	Application should show 'Incorrect email or password ' validation message.	Working as expected	Pass

9. RESULTS

9.1 Performance Metrics

Measure the performance using Metrics

```
pd.crosstab(Y_Test,y_predict)
```

col_0	0	1	2
Sex			
0	108	29	112
1	33	223	35
2	123	52	121

```
print(classification_report(Y_Test,y_predict))
```

```
              precision    recall  f1-score   support

           0       0.41      0.43      0.42       249
           1       0.73      0.77      0.75       291
           2       0.45      0.41      0.43       296

    accuracy                           0.54       836
   macro avg       0.53      0.54      0.53       836
weighted avg       0.54      0.54      0.54       836
```

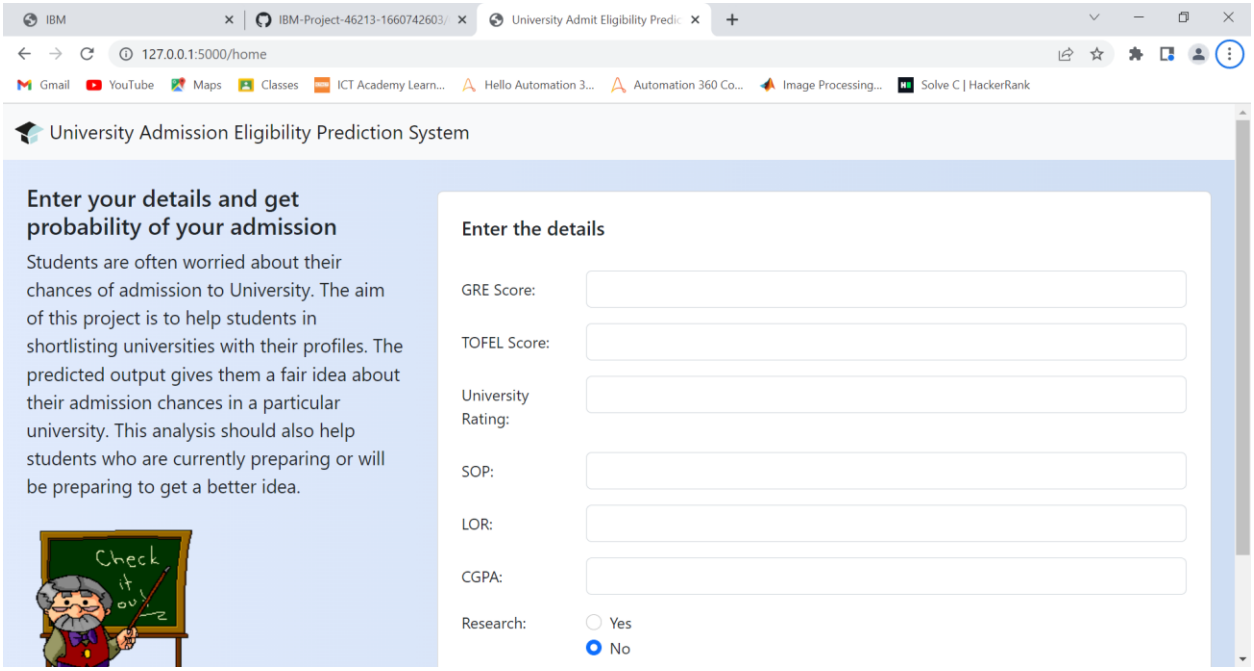
Measuring the performance using metrics

```
from sklearn.metrics import mean_squared_error,mean_absolute_error
from sklearn.metrics import accuracy_score
mse = mean_squared_error(pred_test,y_test)
print("The Mean squared error is: ", mse)
rmse = np.sqrt(mse)
print("The Root mean squared error is: ", rmse)
mae = mean_absolute_error(pred_test,y_test)
print("The Mean absolute error is: ", mae)
acc = lr.score(x_test,y_test)
print("The accuracy is: ", acc)
```

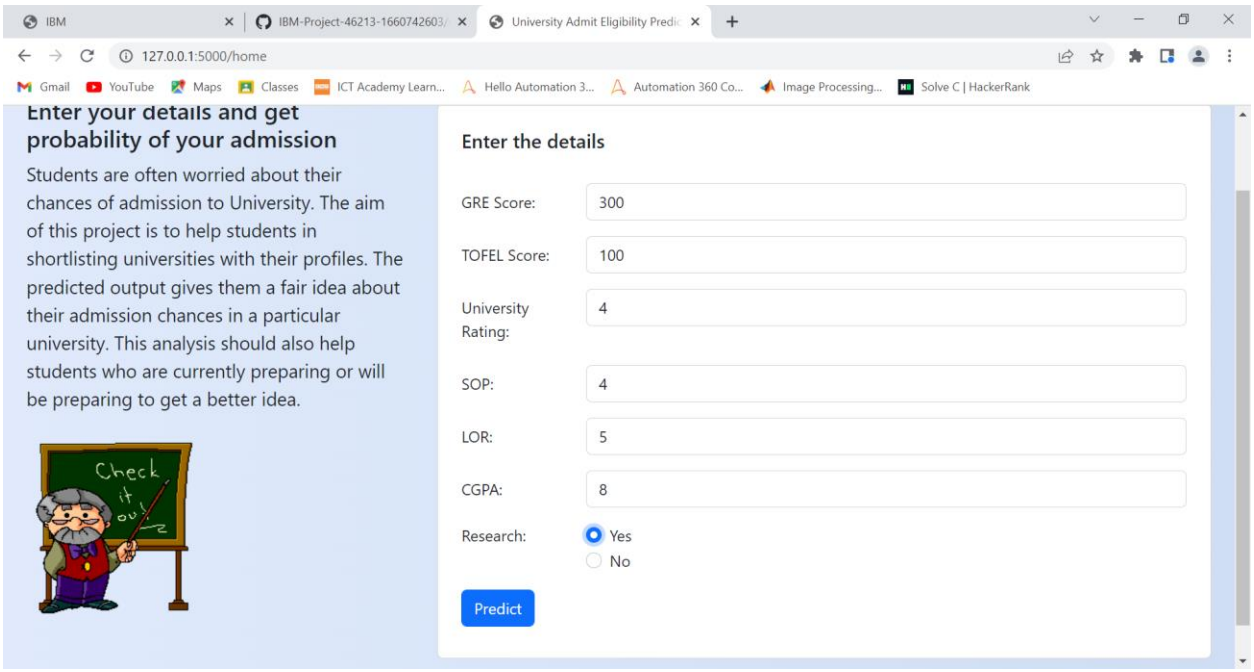
```
The Mean squared error is:  3.403389401193475
The Root mean squared error is:  1.8448277429596172
The Mean absolute error is:  1.3537325298790688
The accuracy is:  0.0657871258637811
```

SCREENSHOTS

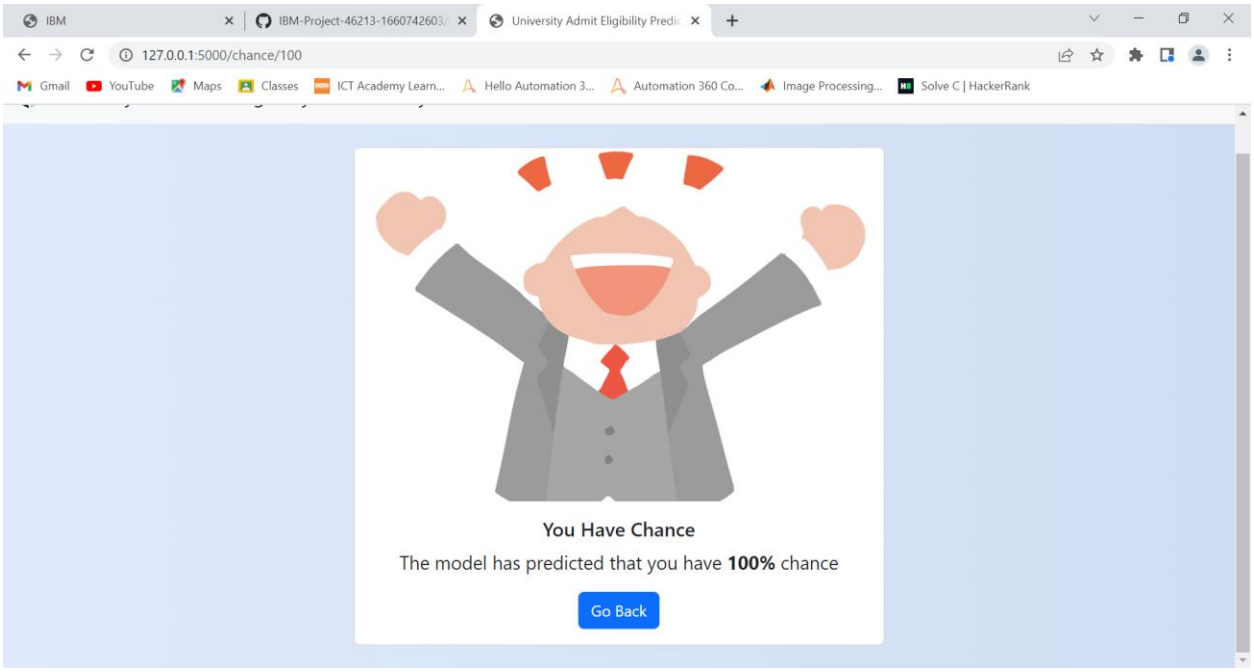
HOME PAGE



ENTER DETAILS



RESULTS



CHAPTER 9
ADVANTAGES & DISADVANTAGES

9.1 Advantages

- It helps student for making decision for choosing a university.
- Here the chance of occurrence of error is less when compared with the existing system.
- It is fast, efficient and reliable. And very user-friendly.
- Number of personnel required is considerably less.

9.2 Disadvantages

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

CONCLUSION

The web application helps the user make wise choice of colleges for his/her option-entry. Also, the user gets an outline/rough idea of the entries they can make in the option-entry process provided by examination authority. The same application can be used for Common Entrance Tests of other states and for other national level entrance exams by only changing the cut-off database of that exam. Proposed application benefits for the student admission community that accommodates the need of students to choose the best college and helps colleges too to recognize their stand in attracting students and finer prediction implies better results for the students.

FUTURE SCOPE

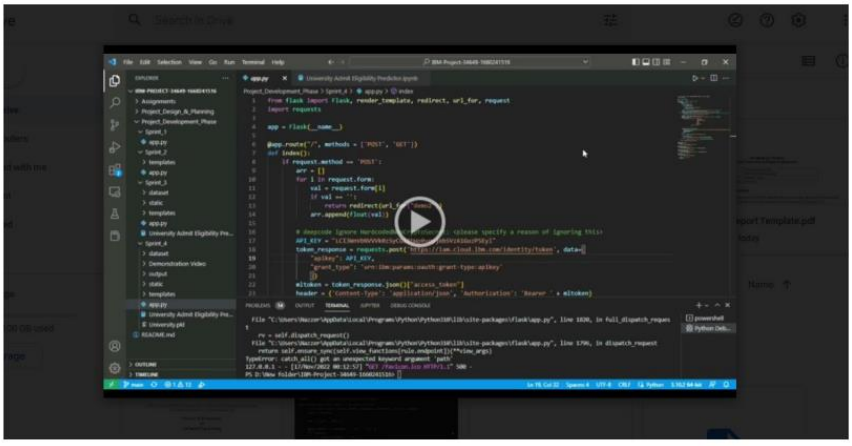
- Future indeed holds for big data science as there is a huge amount of data in the age of the internet, waiting to be utilized to make predictions, decisions and inventions.
- One of the most significant benefits of the University Admit Eligibility Predictor is that they are always open for business and can accept the predictions.
- Universities can use this project to get their work done quickly and efficiently in order to provide admissions to students.

APPENDIX

GitHub link:
https://github.com/IBM-EPBL/IBM-Project-46213-1660742603

Source Link:
https://drive.google.com/drive/folders/11cPxCoSFxthfasFe4isnRmLJfOdGaTGu?usp=share_link

Demo Link:



https://drive.google.com/file/d/1wQp_tyvUnSxg9d_0f_NM6SHFQGCrF8n/view?usp=share_link