UNIVERSITY ADMIT ELIGIBILITY PREDICTOR

IBM PROJECT REPORT
Submitted by

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1. INTRODUCTION

1.1 PROJECT OVERVIEW

A lot of students worry about getting into college. The purpose of this initiative is to help students select colleges based on their profiles. They might get a decent idea of their chances of being admitted to a specific university from the projected outcomes. Students who are/will be studying for exams should find this analysis to be clear. Student admission problem is very important in educational institutions. This paper addresses the issue by proposing machine learning models to predict the chances of a student being admitted to a master's program in a specific university. This will assist students to know in advance if they have a chance to get accepted. Newly graduated students usually are not knowledgeable of the requirements and procedures of post-graduate admission and might spend a considerable amount of money to get advice from consultancy organizations to help them identify their admission chances. Human consultants and calculations might be biased and inaccurate. The machine learning models are multiple linear regression, k-nearest neighbor, random forest, and Multi-layer Perceptron. Experiments show that the Multi-layer Perceptron model surpasses other models.

1.2 PURPOSE

The quality of one's education has a significant impact on their life. When planning for higher education, students typically have a variety of questions about the courses, universities, employment prospects, prices involved, etc. Getting accepted to the university of their dreams is one of their main concerns. Students typically wish to continue their education at colleges and universities with a strong international reputation. It helps students in choosing the 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. It helps you to understand how your profile can be further improved to secure admission to your target college. It can guide you on whether you need to retake the GRE or not, to improve your chances of landing admission to your preferred university. Students from rural backgrounds find it difficult to do the necessary analysis and prepare a preference list. This idea will be beneficial for them. Students who belong to multiple categories face difficulties in analyzing cut-offs in each of these categories and predicting the best colleges they can get admission in. Whatsoever is the student's rank, this application will aid them in finding the best branch and college for his/her rank. This accommodates the need of students to choose the best college and also helps colleges to recognize their potential in attracting students. Accurate prediction implies better results for the students.

2. LITERATURE SURVEY

The majority of international students prioritize studying in the United States of America. The majority of highly regarded universities in the world, a broad selection of programs offered in every field, a highly regarded educational system and faculty, scholarships offered to students, the best job market, and a host of other benefits make it the ideal location for international students. Over 8 million foreign students are enrolled in over 1700 public and 2500 private universities and colleges in the United States, according to a conducted study. (2017) Master Portal

2.1 EXISTING PROBLEM

Universities take into consideration different factors like the score on aptitude-based examinations like the General Record Examination (GRE), command over the English language is judged based on their score in English competency tests like the Test Of English as a Foreign Language (TOEFL) OR International English Language Testing System (IELTS), their work experience in same or other fields, the quality of the Letters Of Recommendation (LOR) and the Statement Of Purpose documents provided by the student. Based on the overall profile of the student decision is taken by the universities admission team whether to admit or reject a particular candidate. Previous research done in this area used the Naive Bayes algorithm which will evaluate the success probability of student application into a respective university but the main drawback is they didn't consider all the factors which will contribute to the student admission process like TOEFL/IELTS, SOP, LOR, and undergraduate score. Bayesian Network algorithm has been used to create a decision support network for evaluating the application submitted by foreign students of the university. This model was developed to forecast the progress of prospective students by comparing the score of students currently studying at university. The model thus predicted whether the aspiring student should be admitted to university based on various scores of students. Since the comparisons are made only with students who got admission into the universities but not with students who got their admission rejected, this method will not be that accurate.

2.2 REFERENCES

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2.3 PROBLEM STATEMENT DEFINITION

Build an application that predicts the university admission chances of a student powered by machine learning models. Train the model and host it on the IBM cloud. The majority of international students studying in the USA are from India and China. In the past decade, India has seen a huge increase in the number of students opting to pursue their education from foreign universities in countries like the USA, Ireland, Australia, Germany, etc. Although there are significant universities and colleges in India, students are finding it difficult to get admission into highly ranked colleges, also getting a job is a challenge as the ratio of the number of students to the number of work opportunities available is quite high. India is one of the leading counties in the number of software engineers produced each year; it becomes tough for students to find jobs in elite companies due to high competition. This motivates a good number of students to pursue post-graduation in their field. It was observed that the number of students pursuing a Master's degree in Computer Science field from universities in the USA is quite high; the focus of this research will be on these students.

3. IDEATION AND PROPOSED SOLUTION

The project aims to develop an application that uses artificial intelligence with the help of a chatbot to customize products for the customers which enhances the fame of an e-commerce store and reduces the time where customers spend on choosing products. The application also uses IBM cloud storage for storing objects.

An application that predicts the university admission chances of a student powered by machine learning models. Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. The primary objective of this research is to develop a system to solve the problems international students are facing while applying for universities in the USA.

I am	I'm trying to	But	Because	Which makes me feel
Student	choose a right college	I'm confused	there is too much on my plate	anxiety
GATE Aspirant	crack GATE exam	I couldn't find a way	I'm not aware of the cutoff	restless
Student	choose a right university	I couldn't fit my profile in any university	many websites are having paid section	daunting
Graduated Student	take my career to next level	I'm finding many ineffective websites	many websites are Ad-enabled	distrustful
Student	pursue my studies in abroad	user interfaces are hard to understand	I'm not aware of fees structure	infuriated
Student	join a college	I'm not able to choose	I don't know about the seat allotment	vexed

3.1 EMPATHY MAP CANVAS

How are personal infos verified?

How trustable is this?

What do they THINK AND FEEL?
what really counts
major preoccupations
worries & aspirations

Lot of features may lead to confusion

How securely the datas are stored?

What about the cost or license?

Is this effective and reliable?

Online support, if any issues

Impersonating and asking to accomplish certain things

Ridiculous registration process

What do they HEAR?
what friends say
what boss say
what influencers say

Is it trustable and verified?

Need to pay extra

What do they SEE?
environment
friends
what the market offers

Are particular colleges and places available?

Lack of updates to the app and its terms & policies

How many results can be seen and accuracy rate?

Doubts on Results and confirmation of Seats

Doubts on Gurantee

Personal info Leaks

Collection of unwanted infos

Doubts on Accuracy

What do they SAY AND DO?
attitude in public
appearance
behavior towards others

Spreads information about this and posts a review

Some Expectations are unsatisfiable

PAIN
fears
frustrations
obstacles

May have good chances of getting into their dream university, but facing financial problems.

GAIN
"wants" / needs
measures of success
obstacles

Instant and Precise Results

Simple steps to find best suitable colleges

Fears on privacy, whether personal info is secured or not

Distance, Long travel times, and unfamiliar area leads to fear of applying

Being frustrated of seeing low chances to get into their expected college

Vast Collection of College and University Details

Best categorization based on the search filters

3.2 IDEATION AND BRAINSTORMING

This task of shortlisting the universities where the student has a high chance of admission is difficult, mainly for international students, so they end up applying to many universities in hopes of getting admission in a few of them thus investing an extra amount of money in the applications. There are several portals and websites which provide information and help students in shortlisting the universities, but they are not reliable. Most of the students don't take the risk of evaluating the colleges by themselves, and they seek the help of the education consultancy firms to do it for them. Again, for this, students have to pay a huge amount of fee to the education consultancies.

3.3 PROPOSED SOLUTION

Random Forest Regression algorithms were used as they were found to be the best fit for the system developed. Also, we will be creating a simple user interface that will help the users to input the data related to student profile and get the predicted result for the application based on the profile as output. This research will thus help students save the extra amount of time and money they may spend at education consultancy firms. And also, it will help them to limit their number of applications to a small number as they will be provided with the suggestion of the universities where they have the best chance of securing admission thus saving more money on the application fees.

1. PROBLEM STATEMENT (PROBLEM TO BE SOLVED)

These days, university admissions are very difficult to secure for even the most exceptional students. A student who is trying to choose the right college based on his/her scores may feel frustrated by the process as they are not aware of the eligibility criteria of universities. Every year, millions of dollars are spent on university applications by students hoping to get admitted. Such spending can be detrimental to students, especially those who hail from poor backgrounds. A student not knowing his or her admission chances to a university is a real problem which needs to be solved.

2. IDEA / SOLUTION DESCRIPTION

We will be developing a University Admit Eligibility Predictor system which will help the students to predict the chances of their application being accepted by a particular university to which they wish to apply for. This idea helps students to shortlist colleges to which they can apply as the system compares the student's marks and the college's cut-off to predict admission probability. Also, the system will provide a recommendation of universities to the student to which the student has a high possibility of getting admission. Multiple machine learning classification algorithms were evaluated to develop the system.

3. NOVELTY / UNIQUNESS

The main advantage of the project is the computerization of the entrance seat allotment process. The total time for the entrance allotment became lesser and the allotment process became faster.

4. SOCIAL IMPACT / CUSTOMER SATISFACTION

We aim to provide a competent admission predictor tool with the highest possible accuracy to students around the world so that they can reassure themselves of their university choices. It helps students for deciding on choosing the right college. It helps students to understand how their profile can be further improved to secure admission to their target college. Students from rural backgrounds find it difficult to do the necessary analysis and prepare a preference list. This idea will be beneficial for them. Successful implementation of our project can save a great amount of students' money.

5. BUSINESS MODEL (REVENUE MODEL)

Institutions around the world are under increasing pressure to admit more students, retain these students, and do their best to ensure student success. Facing this pressure, tech-savvy institutions can benefit greatly from predictive analytics and predictive models to help achieve their goals. With accurate and satisfactory predictions, the integrity of our project will be revered

among universities and students. By developing a positive reputation, our project may potentially attract more universities and students to avail of our service, thus increasing business profits.

6. SCALABILITY OF THE SOLUTION

University admission eligibility is an issue for students all around the world but current solutions only offer predictions on universities in select countries. If our project is successful and attracts a plenitude of clients, then it can be enhanced to provide predictions on universities around the world. The accuracy of the results can be improved by integrating another ML approach if it is found to be more effective. We can also provide connoisseurs who shall work with you to amplify your prospects of receiving offers by evaluating the universities you apply to, making sure you do not digress from your wants and chiefly your goals. We can also invest in analytics professionals that can contribute effectively to the entire process.

3.4 PROBLEM SOLUTION FIT

Project Title: University Admit Eligibility Predictor   **Project Design Phase-I - Solution Fit**   **Team ID: PNT2022TMID21686**

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) **CS**	6. CUSTOMER CONSTRAINTS **CC**	5. AVAILABLE SOLUTIONS **AS**	Explore AS, differentiate
	Who is your customer?	What constraints prevent your customers from taking actions or limit their choices of solutions?	Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have	
	Candidate who wants to select the university according to their eligibility criteria.	• An ability to think and work independently. • A positive attitude towards study. • A passion for the chosen course subject. • An ability to preserve and complete tasks. • An inquiring mind. • Good written English.	• counselling process. • advise from the seniors and literate person. Pros: • Some of them choosing the alternatives. • making decision for choosing a right college. • chance of occurrence of error is less • Proper response fast, efficient, and reliable. Cons: • Lack of proper guidance. • Lack of awareness. • Lack of prior knowledge	

Focus on J&P, tap into BE, understand RC	2. JOBS-TO-BE-DONE / PROBLEMS **J&P**	9. PROBLEM ROOT CAUSE **RC**	7. BEHAVIOUR **BE**	Focus on J&P, tap into BE, understand RC
	Which jobs-to-be-done (or problems) do you address for your customers?	What is the real reason that this problem exists?	What does your customer do to address the problem and get the job done?	
	To find the probability for a student to get an admit in the university before applying. Get all the required documents before counselling or admission.	It helps student for making decision for choosing a right college based on their eligibility. What is the back story behind the need to do this job? The Candidate will do it because to get right University respected to their marks.	To find the right University according to their marks, predict their willing university where they are eligible. The allotment is depending upon the percentage of the candidate and the availability.	

4. REQUIREMENT ANALYSIS

Requirements analysis, also called requirements engineering, is the process of determining user expectations for a new or modified product. These features, called requirements, must be quantifiable, relevant, and detailed. In software engineering, such requirements are often called functional specifications. Requirements analysis is critical to the success or failure of a systems or software project. The requirements should be documented, actionable, measurable, testable, traceable, related to identified business needs or opportunities, and defined to a level of detail sufficient for system design.

4.1 FUNCTIONAL REQUIREMENT

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIn
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP

FR-3	User Information	All the grades and scores necessary for the user's admission will need to be provided.
		These include,
		• English Proficiency Test scores (at least one of the following 2):
		  i. IELTS BAND score on a 9-point scale
		  ii. TOEFL score out of 120 marks
		• Knowledge Evaluation Test scores (which test score depends on which program the student wishes to apply to):
		  i. GRE score out of 340 marks
		  ii. GMAT score out of 800 marks
		• High School / Undergraduate CGPA on a 4.0-point scale

FR-4	User Tasks	The user should complete the following tasks to get their admission prediction scores: • Create an account and enter all the required personal details • Upon successful verification, enter the test scores required for admission prediction • Select the university(s) the user wishes to apply to Upon immaculate completion of these tasks, the user's chances of acceptance to the selected university(s) will be provided

4.2 NON − FUNCTIONAL REQUIREMENTS

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	• Relatively simple interface so User − Friendly • User does not need to know how the solution works i.e., no technical expertise is required to use the product • Takes very little time to provide results as our solution will be adequately optimized under various operational conditions
NFR-2	Security	• Standard authentication protocols will be implemented. • Only those with the correct credentials will be allowed to login into their account • Privacy is guaranteed. The user's personal information will not be shared with any third party
NFR-3	Reliability	• The user can rely on the solution to provide results with the highest possible accuracy • The solution will be thoroughly optimized and tested to ensure fault-free operation • Easy-to-use interface, thus the user can share or recommend the solution to friends and family and rest assured that they won't be perplexed
NFR-4	Performance	• The solution will be sufficiently trained to function under stressful workloads • Efficiently optimized to provide results as soon as possible given the speed of the user's internet connection • Concrete and precise results are guaranteed
NFR-5	Availability	• The solution will be available 24/7 discounting the maintenance periods • Performance of the solution will always be monitored to ensure flawless results at all times • Any reported errors will be quickly fixed so quick recovery is warranted
NFR-6	Scalability	• The solution can be enhanced to provide predictions on universities around the world. • The accuracy of the results can also be improved by integrating another ML approach if it is found to be more effective • The system can be improved to handle more concurrent users if available capacity is not adequate

5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS
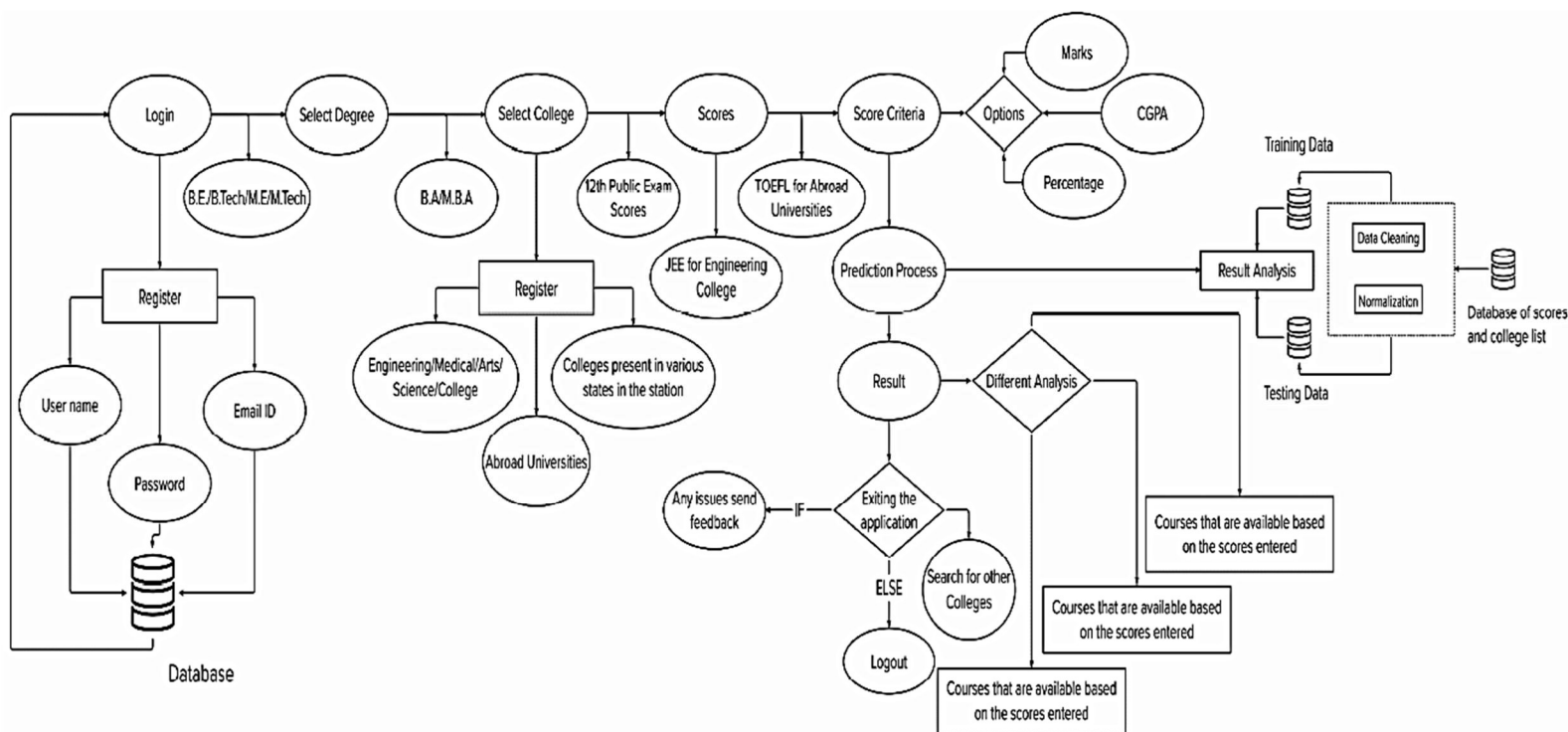
5.2 SOLUTION AND TECHNICAL ARCHITECTURE

SOLUTION ARCHITECTURE

1. This solution helps students to get the list of colleges to which they can apply as the system shortlists the colleges by comparing the student's marks and the college's cut-off.
2. The chance of occurrence of error is less when compared with the existing system.
3. First, Enter the scores in the fields.
4. Next, request the prediction from the web application.
5. It returns the list of colleges after evaluating your scores.
6. It predicts the eligibility score.
7. It recommends the best suitable universities for students based on their GRE, GPA, and TOEFL scores and also predicts admission probability.

Training data

Training ML algorithm

no

Check

yes

Successful model

Model input data

Pre-Processing

ML Algorithm

Machine Learning Prediction

Pickle File (.pkl)

API

Flask

prediction request

prediction score

User

DATA INPUT
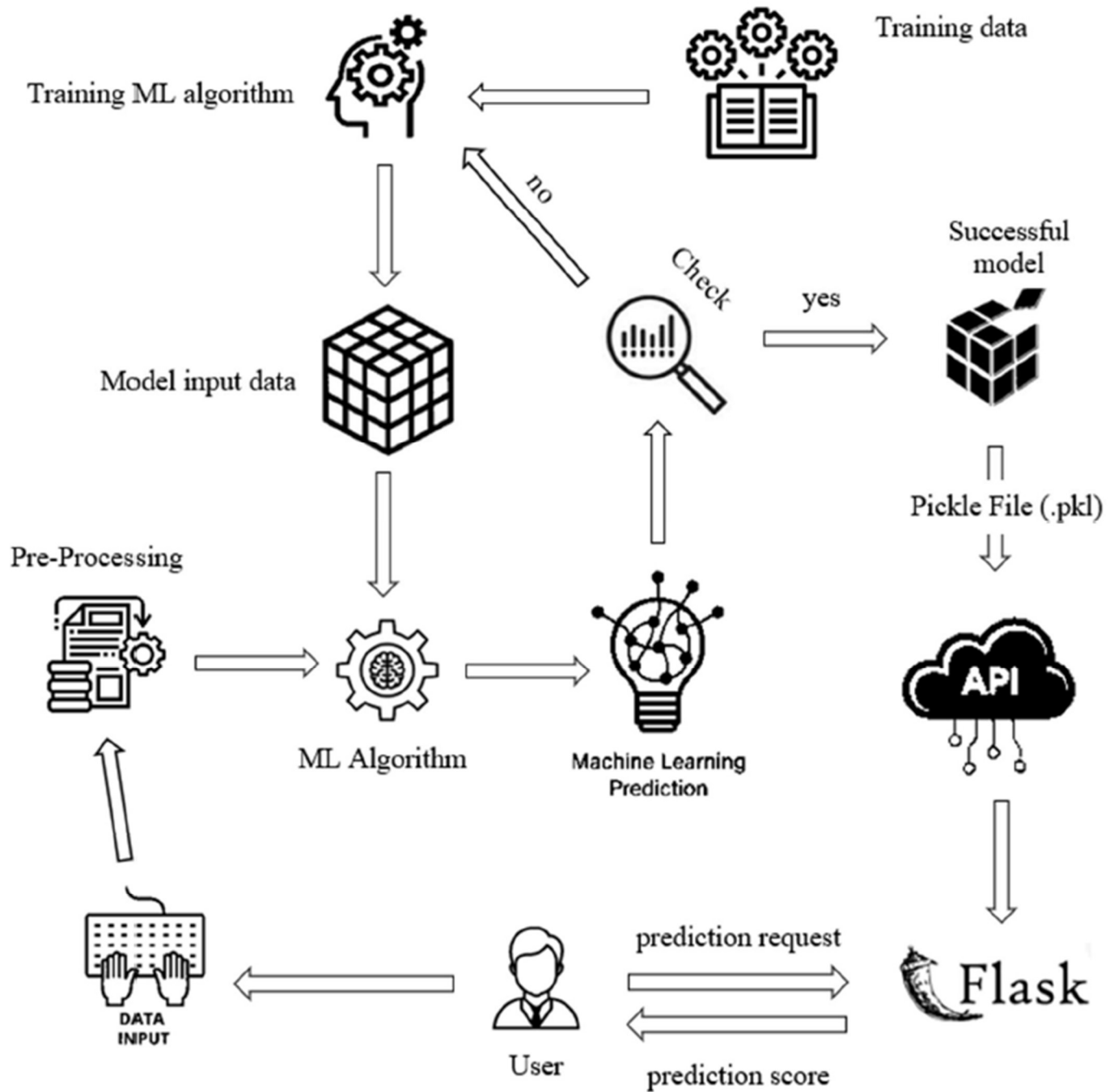
TECHNICAL ARCHITECTURE
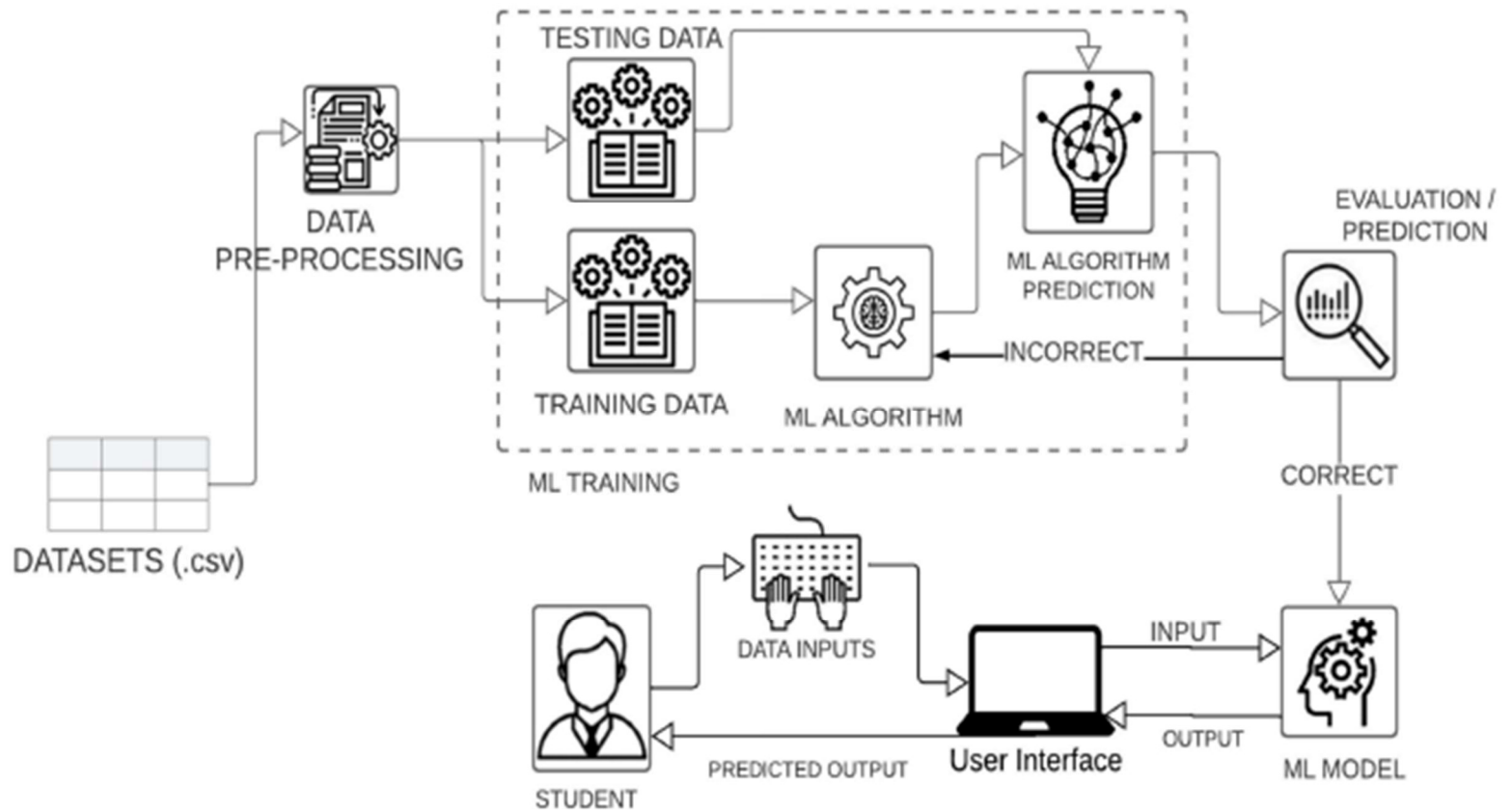
5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Web user and Mobile User)	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 view the dashboard.	High	Sprint – 1
	Confirmation	USN – 2	As a user, I will receive confirmation email I have registered for the application.	I can receive confirmation email &click confirm.	High	Sprint – 1
	Login	USN – 3	As a user, I can log into the application by entering email & password.	I must also have the feature of resetting thepassword.	High	Sprint – 1
	Dashboard	USN – 4	As a user, I must have the scoring details and demo steps to use the portal.	I must have a clear explanation for using thewebsite.	High	Sprint – 1
	Login	USN – 5	As a user, I need to have the access the same as that of the laptop or desktop thesame feel in mobile.	I must not have any discomfort and easy to use in the mobile phonealso.	Medium	Sprint – 2
Administrator	Monitoring	USN – 6	As an administrator, I must have the authentication for the website to know about the data that are been stored by theuser.	I need to maintain to make the user to use the website with ease for the user every time they login.	High	Sprint – 1
Administrator	Database Update	USN – 7	As an administrator, I should update the database as an when a user registers or sets the new password as a rest.	I need a regular update of the database so that the users can access the website without any problems.	High	Sprint – 3
	Update of Dataset	USN – 8	As a admin, I need to analyze the search and entry of scores by the users and need tomake an update if the users are not finding the exact details or prediction expected bythem.	I need to prepare on an analysis based on the users searches on the college names and scores for avoiding any loss of the customers.	Low	Sprint – 4

|						
Customer Care Executive	Chatbot / Contact Details	USN – 9	As a user, I must be able to contact the developer team to enquire about any problems.	I need to see the contact details for the communication with the team at any time.	Medium	Sprint – 2
	Feedback	USN – 10	As a customer, when I any problems in feedback form it must reach the development team.	I need the team to made the updates before the next time using of the website.	Medium	Sprint – 3
Deployment	Maintenance	USN – 11	As a part of maintenance, the maintenance of the server the times o more users using the website	I need to aware of the server capacity so that the interruption of service may not occur.	Medium	Sprint - 2

PROJECT PLANNING AND SCHEDULING

6.1. SPRINT PLANNING AND 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	Sabarish
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	Rajalaksmi
Sprint-1	Login	USN-3	As a user, I can log into the application by entering email & password	2	High	Suryakumar
Sprint-2	Dashboard	USN-4	As a user, I will provide my schooling information in the application	3	High	Ranjith
Sprint-2		USN-5	As a user I will view the colleges which are under my criteria.	2	High	Sabarish
Sprint-3		USN-6	As an Administrator I provide the eligibility criteria of the college for the students.	5	Medium	Suryakumar
Sprint-4		USN-7	As a user after checking my college details I can view the customer care phone number for addition information.	5	Medium	Ranjith

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	15	6 Days	31 Oct 2022	05 Nov 2022	15	05 Nov 2022
Sprint-3	15	6 Days	07 Nov 2022	12 Nov 2022	15	12 Nov 2022
Sprint-4	15	6 Days	14 Nov 2022	19 Nov 2022	15	19 Nov 2022

6.3 REPORTS FROM JIRA
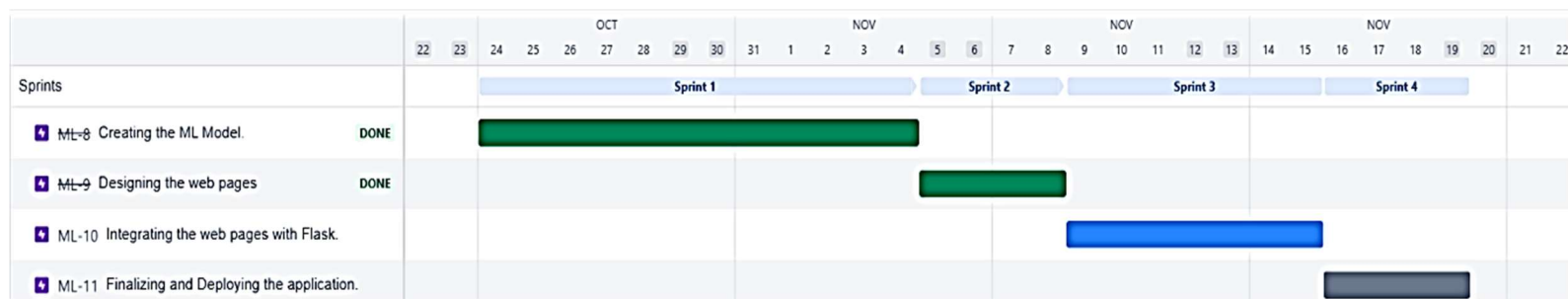
7. CODING AND SOLUTIONING

7.1 FEATURE 1

- We have updated the website image which changes the visual appearance of the website which can be a very effective way to refresh the content.
- It helps to attract attention and to guide the user's line of sight.
- Clear and consistent navigation is a basic requirement for the user interface.
- If it turns out to be difficult, most users will not want to waste their time to figure it out.
- Easy to Understand
- Well-designed and functional
- Site visitors are always in a hurry. Don't make them work for the information. User Experience plays a key role in helping visitors use, understand, and stay on your website.
- Optimized for Search and the Social Web.
- Images enable the identification of features that may not be as easily detected in the spatial domain.

index.html

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>University Admit Eligibility Predictor</title>
    <link rel="stylesheet" href="{{ url_for("static",
filename="css/styles.css") }}">
    <!-- <link rel="stylesheet" href="../static/css/styles.css">-->
    <!-- UIkit CSS -->
    <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/uikit@3.15.12/dist/css/uikit.min.css" />
    <!-- UIkit JS -->
    <script
src="https://cdn.jsdelivr.net/npm/uikit@3.15.12/dist/js/uikit.min.js"></script>
    <script src="https://cdn.jsdelivr.net/npm/uikit@3.15.12/dist/js/uikit-
icons.min.js"></script>
</head>
<body>
    <header class="uk-width-1-1">
        <div class="heading uk-padding-small uk-width-1-1" uk-sticky>
            <a href="#">University Admit Eligibility Predictor</a>
        </div>
    </header>
    <section class="uk-flex uk-flex-center uk-padding-large uk-width-1-1">
        <div class="card uk-padding">
            <div class="info uk-dark">Lets check whether you are eligible or
not...<br />Enter the details below...</div>
            <div class="uk-divider-icon"></div>
            <div class="form">
                <form action="/predict" method="post">
                    <div class="label">
                        <label for="gre">GRE Score</label>
                    </div>
                    <div class="input">
                        <input type="text" name="gre" id="gre"
placeholder="Enter your score between 0 - 360" required/>
                    </div>
                    <div class="label">
                        <label for="toefl">TOEFL Score</label>
                    </div>
                    <div class="input">
                        <input type="text" name="toefl" id="toefl"
placeholder="Enter your TOEFL score between 0 - 120" required/>
                    </div>
```

```html
                    <div class="label">
                        <label for="rating">University Rating</label>
                    </div>
                    <div class="input">
                        <select name="rating" id="rating" required>
                            <option disabled>select a rating</option>
                            <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>
                    </div>
                    <div class="label">
                        <label for="sop">SOP</label>
                    </div>
                    <div class="input">
                        <input type="text" name="sop" id="sop"
placeholder="Enter your SOP score between 0 - 5" required/>
                    </div>
                    <div class="label">
                        <label for="lor">LOR</label>
                    </div>
                    <div class="input">
                        <input type="text" name="lor" id="lor"
placeholder="Enter your LOR score between 0 - 5" required/>
                    </div>
                    <div class="label">
                        <label for="cgpa">CGPA</label>
                    </div>
                    <div class="input">
                        <input type="text" name="cgpa" id="cgpa"
placeholder="Enter your CGPA score between 0 - 10" required/>
                    </div>
                    <div class="label">
                        <label for="research">Research</label>
                    </div>
                    <div class="input">
                        <select name="research" id="research" required>
                            <option value="1">Yes</option>
                            <option value="0">No</option>
                        </select>
                    </div>
                    <div class="btn uk-flex uk-flex-center uk-margin-top">
                        <input type="submit" value="Check" />
                    </div>
                </form>
```

```
            </div>

        </div>
    </section>
    <footer class="uk-width-1-1">
        <div class="heading uk-padding-small uk-width-1-1">
          <a href="#">University Admit Eligibility Predictor</a>
        </div>
    </footer>
</body>
<script src={{url_for("static",filename="js/scripts.js")}}></script>
</html>
```

FEATURE 2

chance.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>University Admit Eligibility Predictor</title>
    <link rel="stylesheet" href="{{ url_for("static",
filename="css/styles.css") }}">
    <!-- <link rel="stylesheet" href="../static/css/styles.css">-->
    <!-- UIkit CSS -->
    <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/uikit@3.15.12/dist/css/uikit.min.css" />
    <!-- UIkit JS -->
    <script
src="https://cdn.jsdelivr.net/npm/uikit@3.15.12/dist/js/uikit.min.js"></script>
    <script src="https://cdn.jsdelivr.net/npm/uikit@3.15.12/dist/js/uikit-
icons.min.js"></script>
</head>
<body>
    <header class="uk-width-1-1">
        <div class="heading uk-padding-small uk-width-1-1" uk-sticky>
          <a href="#">University Admit Eligibility Predictor</a>
        </div>
    </header>
    <section class="uk-flex uk-flex-center uk-flex-column uk-padding-large uk-
width-1-1">
        <div class="card uk-padding uk-box-shadow-xlarge">
            <div class="img">
                <!-- <img src="../static/images/chance.jpeg" alt="response">-->
```

```html
                <img src="{{ url_for("static", filename="images/chance.jpeg")
}}" alt="response">
            </div>
            <div class="msg uk-margin-top uk-padding uk-width-1-1 uk-text-
justify">
                <p>{{msg}}<p>
            </div>
            <div class="nav uk-flex uk-flex-center uk-margin-top uk-width-1-1
uk-link-toggle uk-text-large">
                <a class="uk-link-heading" href="/">Back to Form</a>
            </div>
        </div>
    </section>
    <footer class="uk-width-1-1">
        <div class="heading uk-padding-small uk-width-1-1">
          <a href="#">University Admit Eligibility Predictor</a>
        </div>
    </footer>
</body>
</html>
```

nochance.html

```html
<!DOCTYPE html>

<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>University Admit Eligibility Predictor</title>
    <link rel="stylesheet" href="{{ url_for("static",
filename="css/styles.css") }}">
    <!-- <link rel="stylesheet" href="../static/css/styles.css"> -->
    <!-- UIkit CSS -->
    <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/uikit@3.15.12/dist/css/uikit.min.css" />
    <!-- UIkit JS -->
    <script
src="https://cdn.jsdelivr.net/npm/uikit@3.15.12/dist/js/uikit.min.js"></script>
    <script src="https://cdn.jsdelivr.net/npm/uikit@3.15.12/dist/js/uikit-
icons.min.js"></script>
</head>
<body>
    <header class="uk-width-1-1">
        <div class="heading uk-padding-small uk-width-1-1" uk-sticky>
          <a href="#">University Admit Eligibility Predictor</a>
        </div>
```

```
        </header>
        <section class="uk-flex uk-flex-center uk-flex-column uk-padding-large uk-
width-1-1">
            <div class="card uk-padding uk-box-shadow-xlarge">
                <div class="img">
                    <img src="{{ url_for("static", filename="images/nochance.jpeg")
}}" alt="response">
                </div>
                <div class="msg uk-margin-top uk-padding uk-width-1-1 uk-text-
justify">
                    {{msg}}
                </div>
                <div class="nav uk-flex uk-flex-center uk-margin-top uk-width-1-
1  uk-link-toggle uk-text-large">
                    <a class="uk-link-heading" href="/">Back to Form</a>
                </div>
            </div>
        </section>
        <footer class="uk-width-1-1">
            <div class="heading uk-padding-small uk-width-1-1">
              <a class="uk-link-heading" href="#">University Admit Eligibility
Predictor</a>
            </div>
        </footer>
</body>
</html>
```

7.2 DATABASE SCHEMA

	A	B	C	D	E	F	G	H	I	J
1	Serial No.	GRE Score	TOEFL Sco	University	SOP	LOR	CGPA	Research	Chance of Admit	
2	1	337	118	4	4.5	4.5	9.65	1	0.92	
3	2	324	107	4	4	4.5	8.87	1	0.76	
4	3	316	104	3	3	3.5	8	1	0.72	
5	4	322	110	3	3.5	2.5	8.67	1	0.8	
6	5	314	103	2	2	3	8.21	0	0.65	
7	6	330	115	5	4.5	3	9.34	1	0.9	
8	7	321	109	3	3	4	8.2	1	0.75	
9	8	308	101	2	3	4	7.9	0	0.68	
10	9	302	102	1	2	1.5	8	0	0.5	
11	10	323	108	3	3.5	3	8.6	0	0.45	
12	11	325	106	3	3.5	4	8.4	1	0.52	
13	12	327	111	4	4	4.5	9	1	0.84	
14	13	328	112	4	4	4.5	9.1	1	0.78	
15	14	307	109	3	4	3	8	1	0.62	
16	15	311	104	3	3.5	2	8.2	1	0.61	
17	16	314	105	3	3.5	2.5	8.3	0	0.54	

8 TESTING

8.1 TEST CASE

Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status
Home Page	Verify the UI elements in Home Page		1.Enter URL and click go 2.Verify Home Page with below UI elements: a.GRE Score b.TOEFL Score c.University Rating d.SOP e.LOR f.CGPA g.Research	http://127.0.0.1:8801/	Application should show below UI elements: a.GRE Score b.TOEFL Score c.University Rating d.SOP e.LOR f.CGPA g.Research	Working as expected	Pass
Home Page	Verify the UI elements in Home Page		1.Enter URL and click go 2.Click the text box to enter scores 3.View the image displayed 4.Click submit button to know the prediction	http://127.0.0.1:8801/	1. Should be able to enter the scores 2. The background image should be displayed. 3. The check button should work as intended	Working as expected	Pass
Web page	Verify whether user is able to predict the chance of admit		1.Enter URL(http://127.0.0.1:4000/) and click go 2.Enter the scores in the given fields 3.Click on Submit button, once you have entered all the scores.	a.GRE Score - 334 b.TOEFL Score - 119 c.University Rating - 5 d.SOP - 5 e.LOR - 4.5 f.CGPA - 9.7 g.Research - Yes	The application should show 'Congratulation, you are eligible. As the probability is 95%'	The application shows 'Congratulation, you are eligible. As the probability is 95%'	Pass
Web page	Verify whether user is able to predict the chance of admit		1.Enter URL(http://127.0.0.1:4000/) and click go 2.Enter the scores in the given fields 3.Click on Submit button, once you have entered all the scores.	a.GRE Score - 327 b.TOEFL Score - 111 c.University Rating - 4 d.SOP - 4 e.LOR - 4.5 f.CGPA - 9 g.Research - Yes	The application should show 'Congratulation, you are eligible. As the probability is 84%'	The application shows 'Congratulation, you are eligible. As the probability is 84%'	Pass
Web page	Verify whether user is able to predict the chance of admit		1.Enter URL(http://127.0.0.1:4000/) and click go 2.Enter the scores in the given fields 3.Click on Submit button, once you have entered all the scores.	a.GRE Score - 311 b.TOEFL Score - 104 c.University Rating - 3 d.SOP - 3.5 e.LOR - 2 f.CGPA - 8.2 g.Research - Yes	The application should show 'Congratulation, you are eligible. As the probability is 61%'	The application shows 'Congratulation, you are eligible. As the probability is 62%'	Fail
Web page	Verify whether user is able to predict the chance of admit		1.Enter URL(http://127.0.0.1:4000/) and click go 2.Enter the scores in the given fields 3.Click on Submit button, once you have entered all the scores.	a.GRE Score - 298 b.TOEFL Score - 98 c.University Rating - 2 d.SOP - 4 e.LOR - 3 f.CGPA - 8.03 g.Research - No	The application should show 'Sorry, Unfortunately you aren't eligible.!'	The application shows 'Congratulation, you are eligible. As the probability is 55%'	Fail
Web page	Verify whether user is able to predict the chance of admit		1.Enter URL(http://127.0.0.1:4000/) and click go 2.Enter the scores in the given fields 3.Click on Submit button, once you have entered all the scores.	a.GRE Score - 297 b.TOEFL Score - 96 c.University Rating - 2 d.SOP - 2.5 e.LOR - 2 f.CGPA - 7.43 g.Research - No	The application should show 'Sorry, Unfortunately you aren't eligible. As the probability is 49%'	The application shows 'Sorry, Unfortunately you aren't eligible. As the probability is 49%'	Pass

8.2 USER ACCEPTANCE TESTING

1. PURPOSE OF DOCUMENT

The purpose of this document 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).

2. 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	0	1	1	1	3
Duplicate	2	0	0	0	2
External	0	0	0	0	0
Fixed	0	2	1	0	3
Not Reproduced	1	0	0	0	1
Skipped	0	1	0	0	1
Won't Fix	0	0	0	0	0
Totals	3	4	2	1	10

3. TEST CASE ANALYSIS

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

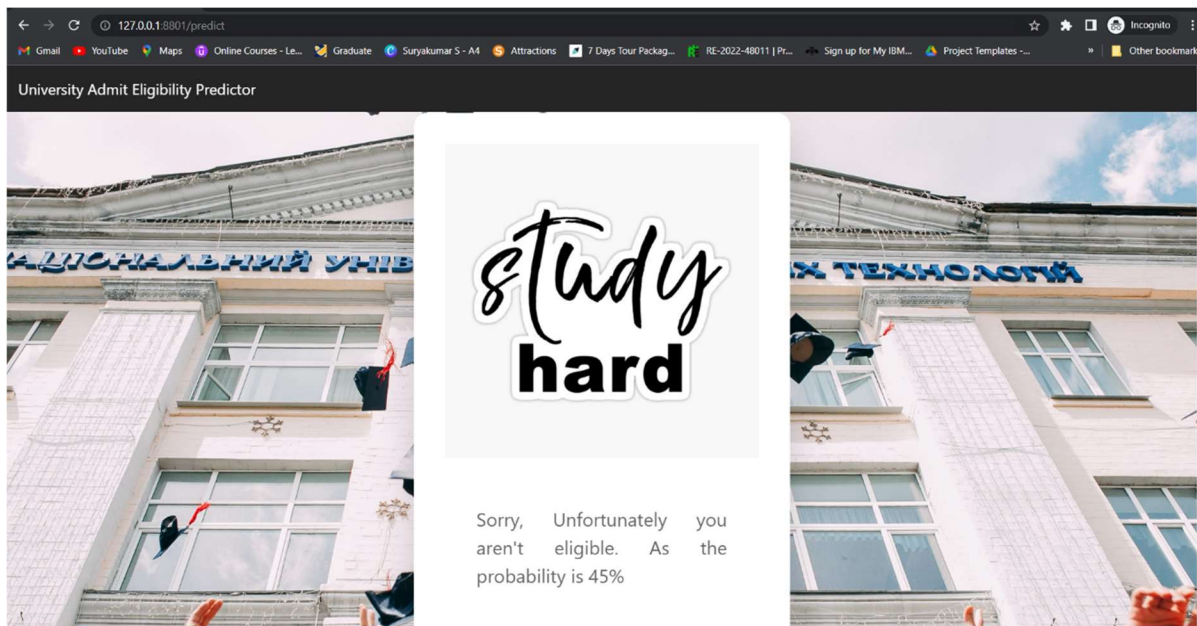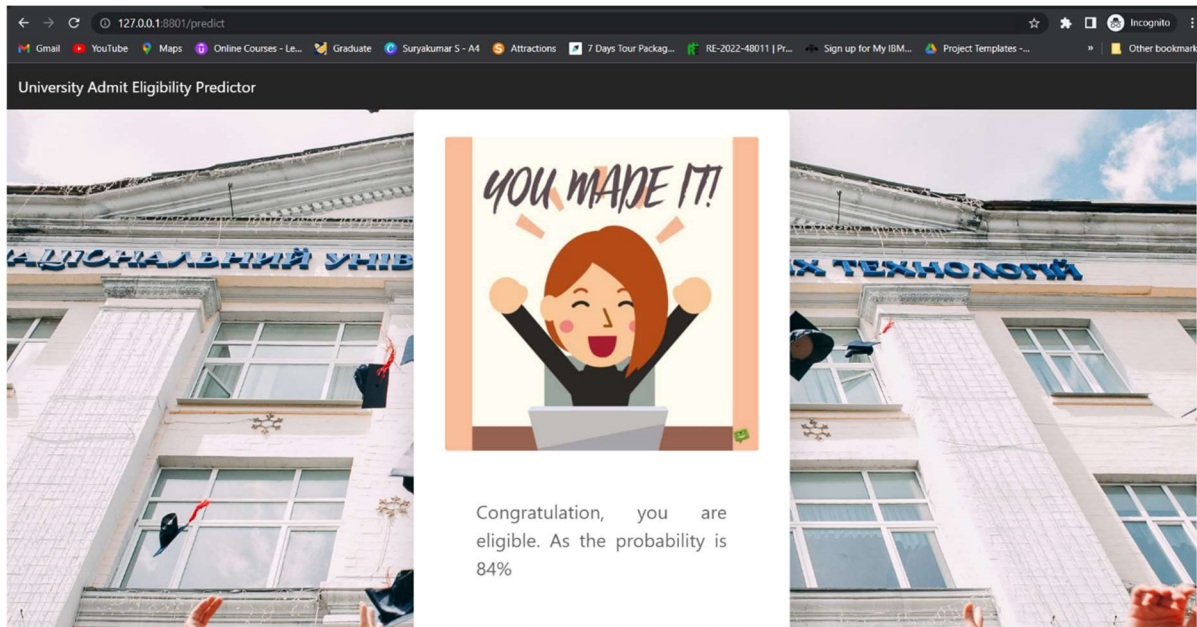| Section	Total Cases	Not Tested	Fail	Pass
View Home Page	8	0	1	7
Enter the scores	15	0	2	13
Click Submit button	3	0	0	3
Image displayed	15	0	3	12
Selecting from Dropdown	4	0	0	4
Final Report Output	35	0	10	25
Version Control	3	0	1	2

9. RESULTS

a. PERFORMANCE METRICS

The Performance is the Accuracy of the model trained.
The training accuracy of the model is 92%.
The testing accuracy of the model is 89%.

S.No.	Parameter	Values	Screenshot
1.	Metrics	**Regression Model:** MAE - 0.05151999999999976, MSE - 0.005147544125000005, RMSE - 0.07174638753972219, R2 score - 0.6803475400971135	```from sklearn.metrics import mean_squared_error, r2_score,mean_absolute_error
print('Mean Absolute Error:', mean_absolute_error(y_test, y_pred))
print('Mean Squared Error:', mean_squared_error(y_test, y_pred))
print('Root Mean Squared Error:', np.sqrt(mean_squared_error(y_test, y_pred)))
print('r2 score:',r2_score(y_pred,y_test))

Mean Absolute Error: 0.051519999999999976
Mean Squared Error: 0.004440446999999992
Root Mean Squared Error: 0.06663667908892214
r2 score: 0.7773793433497371``` |
| 2. | Tune the Model | Hyperparameter Tuning – Cross Validation
Validation Method – GridSearchCV method | ```from sklearn.model_selection import GridSearchCV
import warnings
warnings.filterwarnings('ignore')
parameters = {
    'n_estimators': [100, 150, 200, 250, 300],
    'max_depth': [1,2,3,4],
}
clf = GridSearchCV(estimator = rgr, param_grid = parameters, cv = 3)
clf.fit(X_train, y_train)
print(clf.best_score_)

0.7584872527312757``` |

10. ADVANTAGES AND DISADVANTAGES

ADVANTAGES

- It helps students in choosing the 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.
- It is the easiest way to predict whether a student can secure admission to a university/college.
- It is also unbiased and transparent.
- Students need not depend on consultancies which are infamous for suggesting the colleges/universities that may have contracts with them.
- Moreover, applying to only those colleges/universities where the student has a genuine chance would also reduce the application fee processing time.
- Additionally living expenses of the area where the college/university is located would also be provided on the website.

DISADVANATAGES

- Requires active internet connection.
- System will provide inaccurate results if data is entered incorrectly.
- Other factors such as changes in policies by the university or by the country can also affect the chances of admissions in a way that is beyond the scope of this project.
- Admissions also depend on the individual university's policy regarding the intake of foreign students and are not modelled by our system.

11. CONCLUSION

Student admission problem is very important in educational institutions. This project addresses the issue by providing machine learning models to predict the chance of a student being admitted. This will assist students to know in advance if they have a chance to get accepted. In this paper, machine learning models were trained to predict the chances of a student getting admitted to a master's program. The machine learning models included are multiple linear regression, k nearest neighbor, random forest, and Multilayer Perceptron. Experiments show that the Multilayer Perceptron model surpasses other models. As for future work, more models can be conducted on more datasets to learn which model gives the best performance. We have successfully developed an application using Python, Flask, HTML, and CSS. By using the application, we can predict whether a student can get admission to the desired University or not.

12. FUTURE SCOPE

The future scope of this project is very broad. A few of them are:
- The prediction can be implemented in less time for a faster admission process.
- Download functionalities can be added where the student can download his list of universities, admission eligibility scores, etc.
- More data sets which take in more variables, weights and covariates can be implemented to facilitate a far more accurate prediction based on a wide variety of data.
- Ways to contact universities to clear doubts regarding admissions can be added.
- Future work in the project could include weighing in the features that have been ignored as of yet like the percentage of seats for Foreign Students.
- Other criteria like Co-curricular achievements, Leadership positions held, job experience etc. can also be included as metrics for the model.
- The accuracy of the results can also be improved by integrating another ML approach if it is found to be more effective.
- The system can be improved to handle more concurrent users if available capacity is not adequate.

13. APPENDIX

13.1 SOURCE CODE

```python
from flask import Flask, render_template, request
from math import ceil
import pickle
import requests

app = Flask(__name__)
# model = pickle.load(open("model1.pkl","rb"))

# fetching the ML model from the IBM Deployment space

API_KEY = "TpADwrsyFnYatIlV70EKAo9NQtUrr7HaZsR7TUREFkMR"
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.route('/')
def home():
    return render_template("index.html")

@app.route('/predict',methods=["GET","POST"])
def predict():
    gre=(eval(request.form["gre"])-290)/(340-290)
    toefl=(eval(request.form["toefl"])-92)/(120-92)
    rating=(eval(request.form["rating"])-1.0)/4.0
    sop=(eval(request.form["sop"])-1.0)/4.0
    lor=(eval(request.form["lor"])-1.0)/4.0
    cgpa=(eval(request.form["cgpa"])-6.7)/(10.0-6.7)
    research=request.form["research"]
    if research == 1:
        research = 1
    else:
        research = 0

    payload_scoring = {"input_data": [{
```

```python
        "fields": [["GRE Score","TOEFL Score","University
Rating","SOP","LOR","CGPA","Research"]],
        "values": [[gre,toefl,rating,sop,lor,cgpa,research]]
    }]}

    # fetching the prediction result..

    response_scoring = requests.post('https://us-
south.ml.cloud.ibm.com/ml/v4/deployments/b47f221e-15b5-4c30-a265-
8174210f27b3/predictions?version=2022-11-19', json=payload_scoring,
headers={'Authorization': 'Bearer ' + mltoken})
    # print("Scoring response")
    # print(response_scoring.json())

    temp = response_scoring.json()
    result = temp["predictions"][0]['values'][0][0]

    if result > 0.5:
        return render_template("chance.html",msg="Congratulation, you are
eligible. As the probability is " + str(ceil(result*100))+"%")
    return render_template("nochance.html",msg="Sorry, Unfortunately you aren't
eligible. As the probability is " + str(ceil(result*100))+"%")

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

13.2   GIHTUB AND PROJECT DEMO LINK

GitHub Link:

https://github.com/IBM-EPBL/IBM-Project-12001-1659365879

Project Demo Link:

https://uploadnow.io/en/share?utm_source=3NkrB3g