

A PROJECT REPORT ON UNIVERSITY ADMIT ELIGIBILITY PREDICTOR

Domain : Applied Data Science

Team ID : IBM-Project-42692-1660705650

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TABLE OF CONTENTS

| | |
|--|-----------|
| 1. INTRODUCTION..... | 3 |
| Project Overview | 3 |
| Purpose..... | 3 |
| 2. LITERATURE SURVEY..... | 4 |
| Existing problem..... | 4 |
| References | 4 |
| Problem Statement Definition..... | 5 |
| 3. IDEATION & PROPOSED SOLUTION | 6 |
| Empathy Map Canvas | 6 |
| Ideation & Brainstorming..... | 7 |
| Proposed Solution..... | 8 |
| Problem Solution fit | 9 |
| 4. REQUIREMENT ANALYSIS | 10 |
| Functional requirement | 10 |
| Non-Functional requirements | 10 |
| 5. PROJECT DESIGN | 13 |
| Data Flow Diagrams | 13 |
| Solution & Technical Architecture | 13 |
| User Stories | 16 |
| 6. PROJECT PLANNING & SCHEDULING..... | 17 |
| Sprint Planning & Estimation | 17 |
| Sprint Delivery Schedule..... | 17 |
| Reports from JIRA..... | 18 |
| 7. CODING & SOLUTIONING | 18 |
| Feature 1..... | 18 |
| Feature 2..... | 20 |
| Database Schema | 20 |
| 8. TESTING..... | 21 |
| Test Cases..... | 21 |
| User Acceptance Testing | 22 |
| 9. RESULTS | 23 |
| Performance Metrics | 23 |
| 10. ADVANTAGES & DISADVANTAGES | 24 |
| 11. CONCLUSION | 25 |
| 12. FUTURE SCOPE | 25 |
| 13. APPENDIX..... | 26 |
| Source Code | 26 |
| GitHub & Project Demo Link | 26 |

1. INTRODUCTION

Project Overview

Student admission problem is very important in educational institutions. This paper addresses machine learning models to predict the chance of a student to be admitted to a master's program. This will assist students to know in advance if they have a chance to get accepted. Newly graduate students usually are not knowledgeable of the requirements and the procedure of the postgraduate admission and might spend a considerable amount of money to get advice from consultancy organizations to help them identify their admission chances. Human consultant and calculations might be biased and inaccurate. The machine learning models are multiple linear regression, k-nearest neighbor, random forest, and Multi layer Perception. Experiments show that the Multi layer Perception model surpasses other models.

Purpose

It helps students for making decisions 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. It helps you to understand as to how your profile can be further improved to secure an admit in your target college. It can guide you whether you need to retake the GRE or not, in order to improve your chances of landing an admit in your preferred university. Students from rural background 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 difficulty in analyzing cut-offs in each of these categories and predict the best colleges they can get an admission in. Whatever 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 helps colleges too to recognize their stand in attracting students and finer prediction implies better results for the students.

2. LITERATURE SURVEY

Existing problem

Previous research done in this area used 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 in the student admission process like TOEFL/IELTS, SOP, LOR and under graduate score. Bayesian Networks Algorithm have 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 on the basis of 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 so this method will not be that much accurate.

References

1. N. Chakrabarty, S. Chowdhury, and S. Rana, "A Statistical Approach to Graduate Admissions'Chance Prediction," no. March, pp. 145–154, 2020.
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4. S. Sujay, "Supervised Machine Learning Modelling & Analysis for Graduate Admission Prediction," vol. 7, no. 4, pp. 5–7, 2020.
5. Janani P, Hema Priya V, Monisha Priya S, Prediction of MS Graduate Admissions using Decision Tree Algorithm ,International Journal of Science and Research (IJSR) ISSN: 2319- 7064 ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426.
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Problem Statement Definition

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

3. IDEATION & PROPOSED SOLUTION

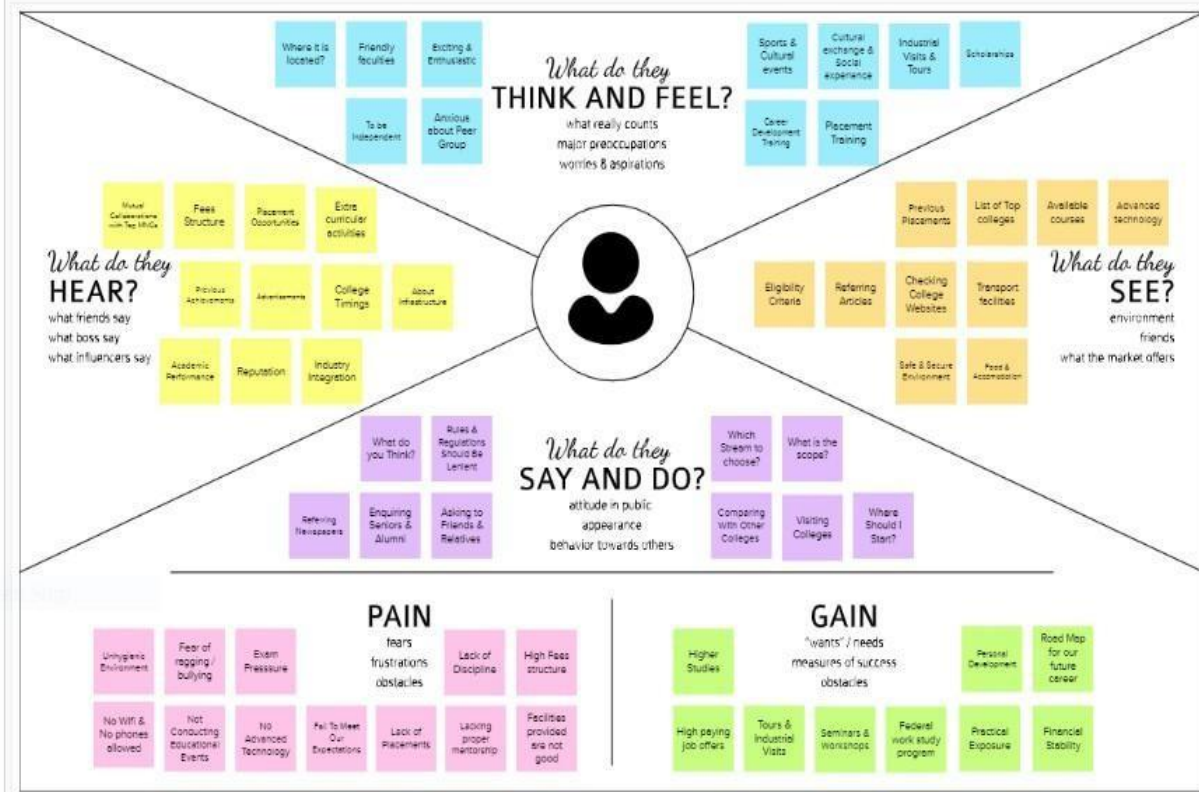
Empathy Map Canvas

Empathy Map Canvas

Gain insight and understanding on solving customer problems.

1

Build empathy and keep your focus on the user by putting yourself in their shoes.



Share your feedback

Ideation & Brainstorming

Brainstorm & Idea prioritization

Use this template to your next brainstorming session or your team's next ideation session. This template will help you generate ideas and prioritize them.

- 1. Brainstorming
- 2. Prioritization
- 3. Ideation

Before you collaborate

1. Set up your workspace. Make sure you have a clear workspace with a whiteboard or a large sheet of paper. This will help you organize your ideas.

2. Set up your agenda. Make sure you have a clear agenda for your session. This will help you stay focused and on track.

3. Set up your materials. Make sure you have all the materials you need for your session. This will help you avoid interruptions and keep your session flowing.

Define your problem statement

1. Write down your problem statement. This will help you focus your brainstorming session on a specific problem.

2. Write down your goals. This will help you know what you want to achieve from your session.

3. Write down your constraints. This will help you know what you are working with and what you are not working with.

Brainstorm

1. Write down your ideas. This will help you generate a large number of ideas.

2. Write down your questions. This will help you explore your ideas further.

3. Write down your thoughts. This will help you organize your ideas and see how they relate to each other.

Group ideas

1. Write down your ideas. This will help you generate a large number of ideas.

2. Write down your questions. This will help you explore your ideas further.

3. Write down your thoughts. This will help you organize your ideas and see how they relate to each other.

Prioritize

1. Write down your ideas. This will help you generate a large number of ideas.

2. Write down your questions. This will help you explore your ideas further.

3. Write down your thoughts. This will help you organize your ideas and see how they relate to each other.

After you collaborate

1. Write down your ideas. This will help you generate a large number of ideas.

2. Write down your questions. This will help you explore your ideas further.

3. Write down your thoughts. This will help you organize your ideas and see how they relate to each other.

1. Brainstorming

2. Prioritization

3. Ideation

4. Group ideas

5. Prioritize

6. After you collaborate

Proposed Solution

1. Problem Statement (Problem to be solved)

I am a Student who is trying to choose a right college based on scores but I couldn't because I am not aware of eligibility criteria which makes me feel frustrated.

2. Idea / Solution description

This idea 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 college's cut off and also predicting admission probability.

3. Novelty / Uniqueness

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

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. It helps you to understand as to how your profile can be further improved to secure an admit in your target college. It can guide you whether you need to retake the GRE or not, in order to improve your chances of landing an admit in your preferred university. Students from rural background find it difficult to do the necessary analysis and prepare a preference list. This idea will be beneficial for them.

5. Business Model (Revenue Model)

Like most areas of the educational world these days, technology is forcing higher education institutions to do more with less. Institutions 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. Predictive analytics has also allowed colleges to better tailor their advising services and personalize learning to improve student outcomes as well as institutional efficiencies.

6. Scalability of the Solution

This will also help you to finalize your dream schools with a realistic road map, with the help of factual information coupled with a bit of reality check on your academic scores, credentials, work experience, your eminence over your peers. On the other hand, we have connoisseurs who shall work with you to amplify your prospects of receiving offers by ensuring that the universities you apply, do not digress from your profile, and chiefly your ambition. However with open source technology widely available, analytics tools are easier to access and are getting more affordable. The key lies in investing in analytics professionals that can contribute effectively to the entire process. Another concern is privacy and ownership for both students and teachers

Problem Solution fit

Problem-Solution fit canvas 2.0 Purpose / Vision To choose a right college based on scores

| | | | | | |
|--|---|---|---|-------------|---------------------------------------|
| Define CS, fit into | 1. CUSTOMER SEGMENT(S) CS Who is your customer? Students | 6. CUSTOMER CC What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices. Network connection, Cost, Time, Poor Knowledge, Lack of Resources. | 5. AVAILABLE SOLUTIONS AS 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? i.e. pen and paper is an alternative to digital networking Seat allotment, Eligibility criteria, Previous year cut off, Exam scores like GRE, TOEFL, GATE etc. | Explore AS, | |
| | 2. JOBS-TO-BE-DONE / PROBLEMS J&P Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one, explore different sides. High Fees structure, Placement Opportunities & Training, Courses Offered, Advanced Technology, Career development programmes. | 9. PROBLEM ROOT CAUSE RC What is the real reason that this problem exists? What is the back story behind the need to do this job? i.e. customers have to do it because of the change in regulations. Lack of Placement Opportunities and Not meeting the Expected cut off. Due to high Competition & less Opportunities results in the difficulty to choose a right college. | 7. BEHAVIOUR BE What does your customer do to address the problem and get the job done? i.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (i.e. Groupspace) Referring Articles & Checking websites, Visiting College premises, Academic Performance, Fees structure and Enquiring Alumni. | | Focus on J&P, tap into BE, understand |
| | 3. TRIGGERS TR What triggers customers to act? i.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news. To put a road map for future career & to get high paying job offers. | 10. YOUR SOLUTION SL If you are working on an existing business, write down your current solution first, fill in the curves, and check how much it fits reality. If you are working on a new business proposition, then keep it blank until you fill in the curves and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour. This idea helps students to get the list of colleges by comparing the student's marks and college's cut off and predicting admission probability. Here the chance of occurrence of error is less when compared to existing system. It is fast, efficient and reliable. It helps you to understand as to how your profile can be further improved to secure an admit in your target college. | 8. CHANNELS of BEHAVIOUR CH 8.1 ONLINE What kind of actions do customers take online? Extract online channels from #7 Referring Articles & Websites, Advertisements, College Reputation, Courses Available, List of Top Colleges, Eligibility Criteria, Previous Placements. 8.2 OFFLINE What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development. Visiting College campuses, Food & Accommodation, Transport & Lab facilities, Enquiring College students, Speaking to Academic representatives. | | |
| 4. EMOTIONS: BEFORE / AFTER EM How do customers feel when they face a problem or a job and afterwards? i.e. lost, insecure > confident, in control - use it in your communication strategy & design. Confused, Anxious about peer group, Exciting & Enthusiastic & Friendly Faculties. | | | | | |
| Identify strong TR & EM | | | | | |

4. REQUIREMENT ANALYSIS

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 Details | Enter the Marks scored <ul style="list-style-type: none">● HSC/Diploma score● GRE score● TOEFL score● GATE score● IELTS score● CGPA etc. |
| FR-4 | User Requirements | <ul style="list-style-type: none">● Choose the tier of university they wish to apply and then get a prediction of their chances of admission to that level university based on the mapping between their requirements and the student's results.● The system shall allow the user's details to be stored for the next time they return to the website.● If the user chooses to take a new evaluation, the most recent inputs as well as prediction shall replace any previous data. |

Non-Functional requirements

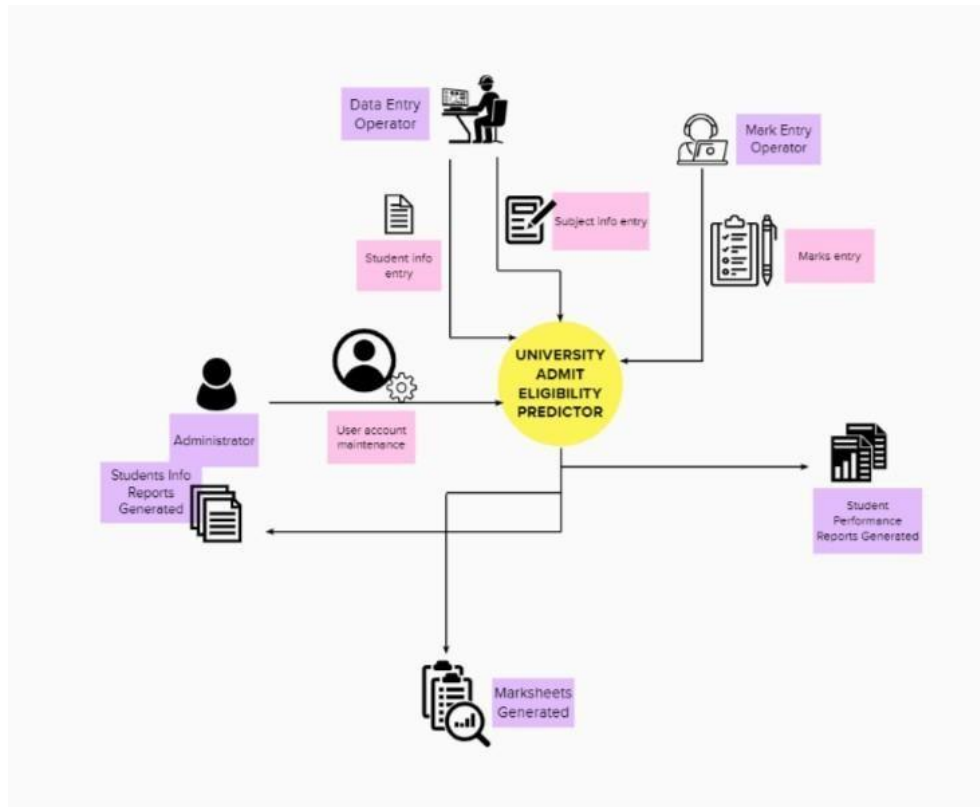
| FR No. | Non-Functional Requirement | Description |
|--------|----------------------------|--|
| NFR-1 | Usability | <ul style="list-style-type: none">● No training is required to use the website.● The form, home, about, FAQ and analysis pages load up within 10 seconds.● The results from the predictor should not take more |

| | | |
|-------|---------------------|--|
| | | than 30 seconds. |
| NFR-2 | Security | <ul style="list-style-type: none"> ● The system shall provide password protected access to the website to all users – students & admins both. |
| NFR-3 | Reliability | <ul style="list-style-type: none"> ● University Application process itself being a tedious task students needs lots of endeavor and determination for completing overall application process. ● It seems students have to work on lots of things when he/she prepares for application process. ● It would definitely be easier for students if they get relief from step of selecting best suited universities and colleges for application. ● This would encourage them to work vigorously on other application components so that their application candidacy will be potent enough to be selected. ● This system shall be completely operational all hours of the day unless system failure or upgradation work is to be performed. ● Downtime after a failure shall not exceed 24 hours. |
| NFR-4 | Performance | <ul style="list-style-type: none"> ● This system can support any number of users at a time. ● The mean time to view a webpage over a 56 Kbps modem connection shall not exceed 5 seconds. |
| NFR-5 | Availability | <ul style="list-style-type: none"> ● Easy access of data. ● Avoids data redundancy and inconsistency. ● It is fast, efficient and reliable. ● Very user friendly. ● Chances of occurrence of error is less when compared to existing system. |

| | | |
|-------|--------------------|---|
| NFR-6 | Scalability | <ul style="list-style-type: none"> ● This will also help you to finalize your dream schools with a realistic road map, with the help of factual information coupled with a bit of reality check on your academic scores, credentials, work experience, your eminence over your peers. ● On the other hand, we have connoisseurs who shall work with you to amplify your prospects of receiving offers by ensuring that the universities you apply, do not digress from your profile, and chiefly your ambition. ● However with open source technology widely available, analytics tools are easier to access and are getting more affordable. ● The key lies in investing in analytics professionals that can contribute effectively to the entire process. ● Another concern is privacy and ownership for both students and teachers. |
|-------|--------------------|---|

5. PROJECT DESIGN

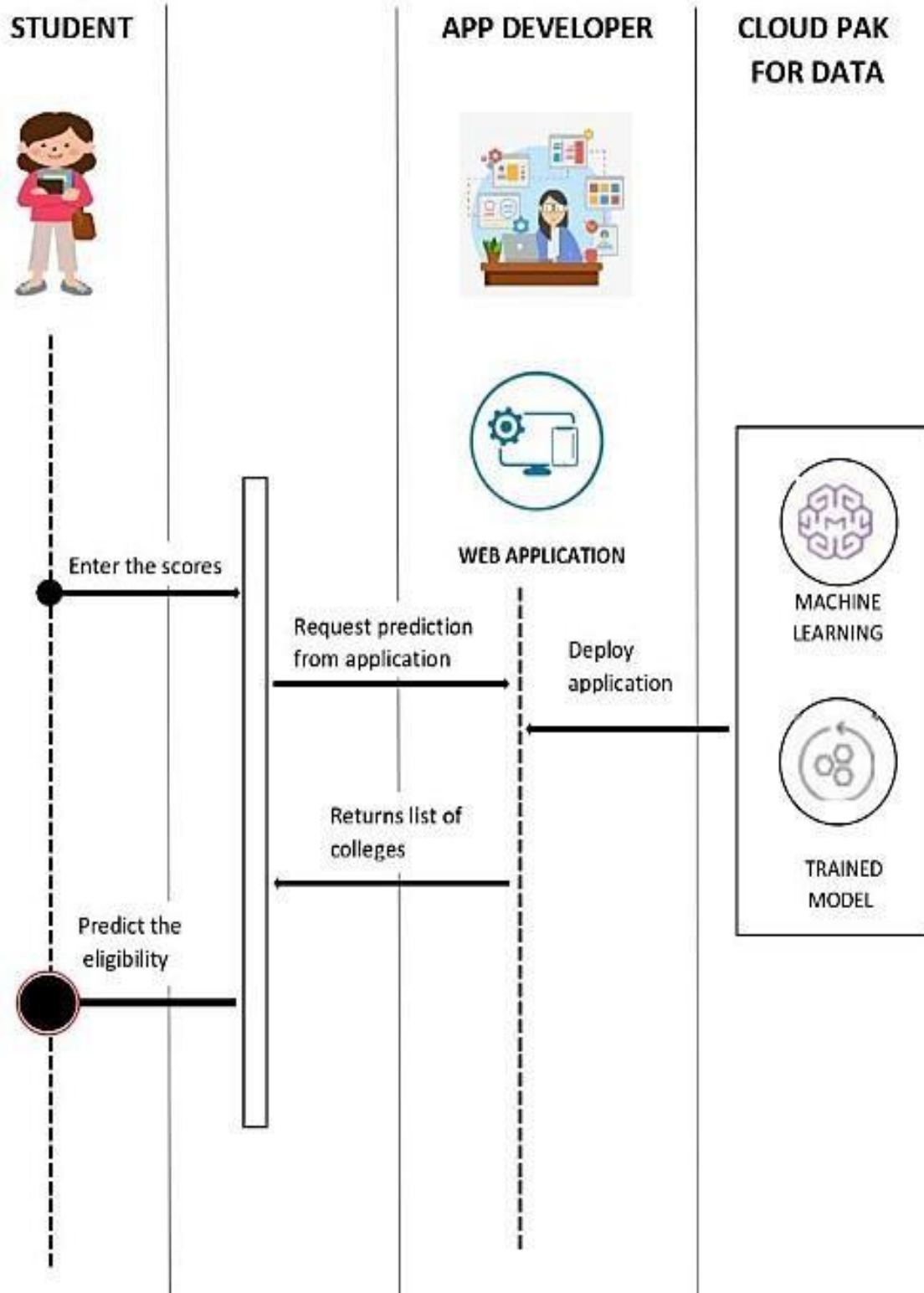
Data Flow Diagrams



Solution & 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 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 web application.
5. Returns the list of colleges based on scores.
6. Predicts the eligibility score.
7. Recommending best suitable universities to students based on their GRE, GPA and TOEFL scores and also predicting admission probability.

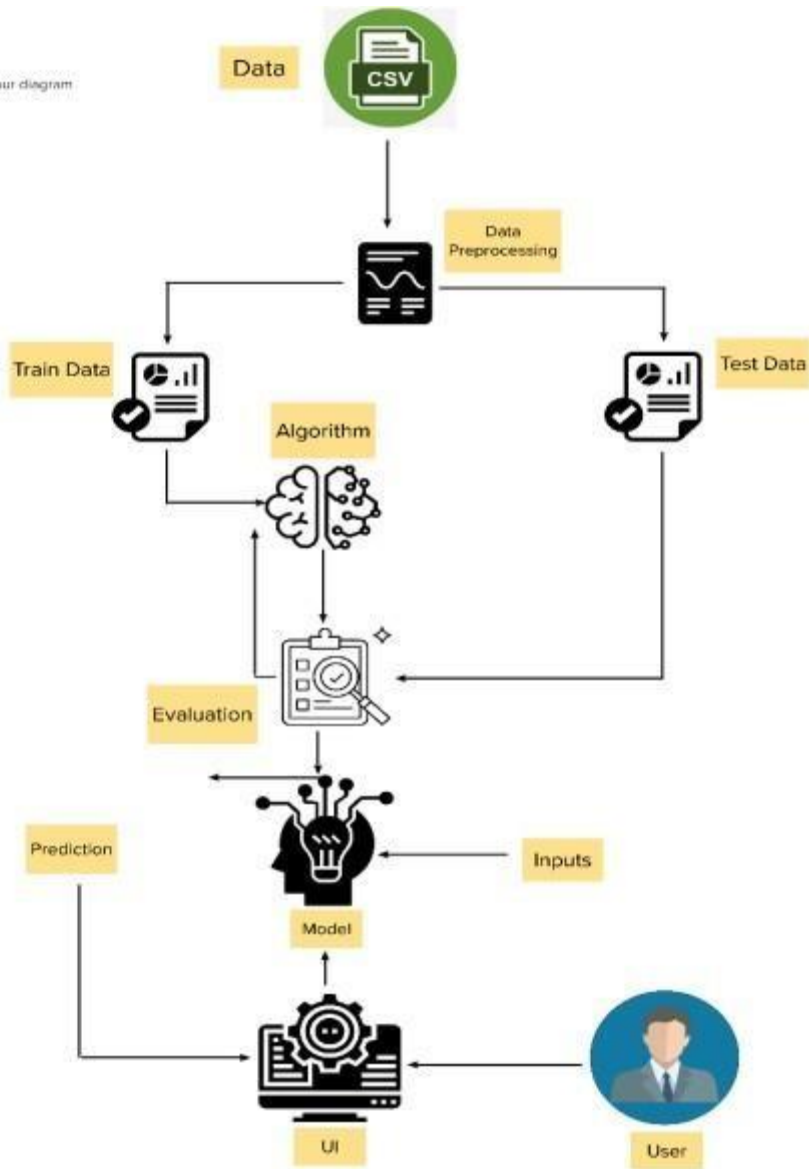


Technical Architecture

ONS

s in the key to build your diagram

tions



User Stories

User Stories

Use the below template to list all the user stories for the product.

| User Type | Functional Requirement (Epic) | User Story Number | User Story / Task | Acceptance criteria | Priority | Release |
|------------------------|-------------------------------|-------------------|---|---|----------|----------|
| Customer (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 / 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 | High | Sprint-1 |
| | | USN-3 | As a user, I can register for the application through Facebook | I can register & access the dashboard with Facebook Login | Low | Sprint-2 |
| | Login | USN-4 | As a user, I can register for the application through Gmail | I can register & access the dashboard with Gmail Login | Medium | Sprint-1 |
| | | USN-5 | As a user, I can log into the application by entering email & password | I can access the dashboard | High | Sprint-1 |
| | | USN-6 | As a user, I can enter the scores. | I can find eligibility | High | Sprint-2 |
| Customer (Web user) | Registration | USN-7 | 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-8 | As a user, I will receive confirmation email once I have registered for the application | I can receive confirmation email & click confirm | High | Sprint-1 |
| | | USN-9 | As a user, I can register for the application through Facebook | I can register & access the dashboard with Facebook Login | Low | Sprint-2 |

| User Type | Functional Requirement (Epic) | User Story Number | User Story / Task | Acceptance criteria | Priority | Release |
|-------------------------|-------------------------------|-------------------|---|--|----------|----------|
| | | USN-10 | As a user, I can register for the application through Gmail | I can register & access the dashboard with Gmail Login | Medium | Sprint-1 |
| | Login | USN-11 | As a user, I can log into the application by entering email & password | I can access the dashboard | High | Sprint-1 |
| | Dashboard | USN-12 | As a user, I can enter the scores. | I can find eligibility | High | Sprint-2 |
| Customer Care Executive | Support | USN-13 | As a Customer Care Executive, responding to queries via telephone, live chat etc. | Immediate response is sent. | Medium | Sprint-3 |
| | | USN-14 | As a Customer Care Executive, Ask for and act on customer feedback | Thank you for your valuable feedback | High | Sprint-2 |
| | | USN-15 | As a Customer Care Executive, analyse customer data and communication to adjust customer care strategies. | We'll look into that issue soon & try to rectify it | Low | Sprint-3 |
| Administrator | Administrative functions | USN-16 | As an Administrator, design, develop, maintain and troubleshoot websites. | No issues are found | High | Sprint-3 |
| | | USN-17 | As an Administrator, view and manage user permissions in an application. | Allows the user to manage permissions | Low | Sprint-4 |
| | | USN-18 | As an Administrator, implementing user protocols & creating backups. | Data is synced & later recovered | Medium | Sprint-4 |
| | | USN-19 | As an Administrator, resolving software problems & updating new features. | Update to new features | High | Sprint-4 |

6. PROJECT PLANNING & SCHEDULING

Sprint Planning & Estimation

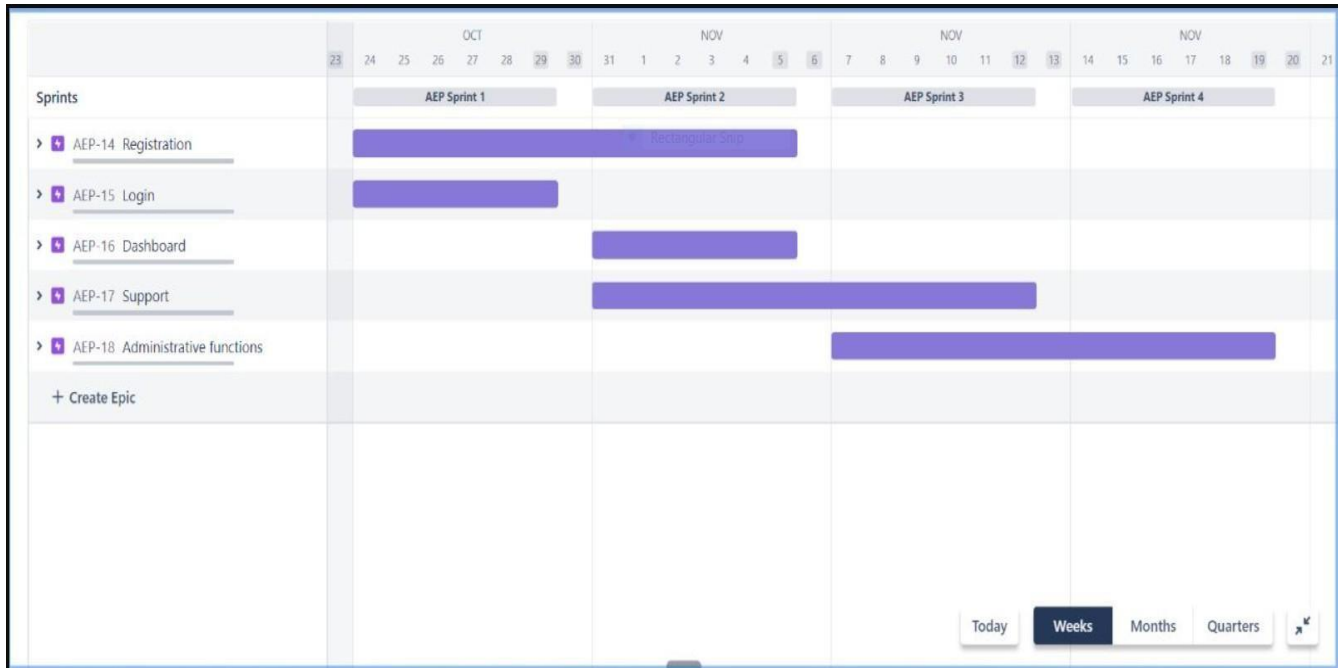
| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|----------|-------------------------------|-------------------|---|--------------|----------|--------------|
| Sprint-1 | Registration | USN-1 | As a user, I can register for the application by entering my email, password, and confirming my password. | 5 | High | M Rajeswari |
| Sprint-1 | | USN-2 | As a user, I will receive confirmation email once I have registered for the application | 5 | High | A Sweatha |
| Sprint-2 | | USN-3 | As a user, I can register for the application through Facebook | 5 | Low | A Sweatha |
| Sprint-1 | | USN-4 | As a user, I can register for the application through Gmail | 5 | Medium | Niranjani R |
| Sprint-1 | Login | USN-5 | As a user, I can log into the application by entering email & password | 5 | High | Sarika K |
| Sprint-2 | Dashboard | USN-6 | As a user, I can enter the scores. | 5 | High | Sarika K |
| Sprint-3 | Support | USN-7 | As a Customer Care Executive, responding to queries via telephone, live chat etc. | 5 | Medium | Sarika K |
| Sprint-2 | | USN-8 | As a Customer Care Executive, Ask for and act on customer feedback | 5 | High | M Rajeswari |
| Sprint-3 | | USN-9 | As a Customer Care Executive, analyse customer data and communication to adjust customer care strategies. | 5 | Low | Niranjani R |
| Sprint-3 | Administrative functions | USN-10 | As an Administrator, design, develop, maintain and troubleshoot websites. | 5 | High | M Rajeswari |
| Sprint-4 | | USN-11 | As an Administrator, view and manage user permissions in an application. | 5 | Low | M Rajeswari |

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|----------|-------------------------------|-------------------|---|--------------|----------|--------------|
| Sprint-4 | | USN-12 | As an Administrator, implementing user protocols & creating backups. | 5 | Medium | A Sweatha |
| Sprint-4 | | USN-13 | As an Administrator, resolving software problems & updating new features. | 5 | High | Niranjani R |

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 |

Reports from JIRA



7. CODING & SOLUTIONING

Feature 1

- We have updated the website image which can change the visual apperance of websitethat can be very effective way to refresh the above fold content .
- It help 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 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 enables the identification of features that may not be as easily detected in the spatial domain.

```

<!DOCTYPE html>
<html>
<head>
  <title>University Admit Eligibility Predictor</title>
</head>
<link rel="preconnect" href="https://fonts.gstatic.com">
<link href="https://fonts.googleapis.com/css2?family=Raleway:wght@100&display=swap" rel="stylesheet">
<link href="https://fonts.googleapis.com/css2?family=Noto+Sans+HK:wght@500&display=swap" rel="stylesheet">
<style type="text/css">

  h1,h2{
    font-family: 'Times New Roman', serif;
    color: black;
  }
  h2,h1,form,p,b{
    text-align: left;
    color: black;
  }
  label,p,b{
    font-family: 'Arial', sans-serif;
    color: black;
  }
  .elements{
    padding-top: 1px;
  }

</style>
<body>


<h1 style="font-size: 3rem; text-decoration-line: underline; text-decoration-thickness: auto;">University Admit Eligibility Predictor</h1>

<p style="font-size: 2rem; font-family: 'Arial', sans-serif;"><strong> ABOUT </strong></p>
<p style="font-size: 1.5rem; font-family: 'Helvetica', sans-serif;">Enter your details to predict whether you'll get an admission or not .</p>

  <form action="/predict" method="post" class="elements" style="font-size: 1rem;">
    <p style="font-size: 2rem; font-family: 'Arial', sans-serif;"><strong> DETAILS </strong></p>
    <p class="elements">GRE Score</p>
    <p><input type="text" name="gre" value="Score range 0-340" style="border-radius: 8px;"></p>
    <p class="elements">TOEFL Score</p>
    <p><input type="text" name="tofl" value="Score range 0-120" style="border-radius: 8px;"></p>
    <p class="elements"><label>University Rating</label> </p>
    <select name="rating" style="border-radius: 8px;">
      <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 class="elements">SOP</p>
    <p><input type="text" name="sop" value="Score range 0-5" style="border-radius: 8px;"></p>
    <p class="elements">LOR</p>
    <p><input type="text" name="lor" value="Score range 0-5" style="border-radius: 8px;"></p>
    <p class="elements">CGPA</p>
    <p><input type="text" name="cgpa" value="Score range 0-10" style="border-radius: 8px;"></p>
    <p class="elements"><label>Research</label></p>
    <select name="research" style="border-radius: 8px;">
      <option value="Yes">Yes</option>
      <option value="No">No</option>
    </select>
    <p class="elements"><input type="Submit" value="Submit" style="border-radius: 8px;"> </p>
  </form>

</body>
</html>

```


Feature 2

Chance

```
<!DOCTYPE html>
<html>
<head>
  <title>eligibility</title>
</head>
<body>
  
  <div style="padding-top: 15%">
    <h2>Predicting chance of admission</h2>
    <h3>A Machine Learning Web App Using Flask</h3>
    <p>Prediction : <b>You've a <b>{{p}}</b> chance to get the admission !</b></p>
  </div>
</body>
</html>
```

No Chance

```
<!DOCTYPE html>
<html>
<head>
  <title>eligibility</title>
</head>
<body>
  
  <div style="padding-top: 15%">
    <h2>Predicting chance of admission</h2>
    <h3>A Machine Learning Web App Using Flask</h3>
    <p>Prediction : <b>You don't have a chance!</b></p>
  </div>
</body>
</html>
```

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

Test Cases

| Test case ID | Feature Type | Component | Test Scenario | Pre-Requisite | Steps To Execute | Test Data | Expected Result | Actual Result | Status |
|------------------|--------------|-----------|--|---------------|--|---|---|---|--------|
| LoginPage_TC_001 | UI | 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 | http://127.0.0.1:4000/ | 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 |
| LoginPage_TC_002 | UI | 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://127.0.0.1:4000/ | 1. Should be able to enter the scores 2. The image should be displayed on the right side. 3. We can know the chance of admit | Working as expected | Pass |
| LoginPage_TC_003 | Functional | Web page | Verify 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 - 3.7 g.Research - Yes | Application should show 'You have a 95% chance to get the admission!' | Application should show 'You have a 95% chance to get the admission!' | Pass |
| LoginPage_TC_004 | Functional | Web page | Verify 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 - 3 g.Research - Yes | Application should show 'You have a 84% chance to get the admission!' | Application should show 'You have a 84% chance to get the admission!' | Pass |
| LoginPage_TC_005 | Functional | Web page | Verify 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 - 3.2 g.Research - Yes | Application should show 'You have a 61% chance to get the admission!' | Application should show 'You have a 65% chance to get the admission!' | Fail |
| LoginPage_TC_006 | Functional | Web page | Verify 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 - 3.03 g.Research - No | Application should show 'You don't have a chance!' | Application should show 'You have a 55% chance to get the admission!' | Fail |
| LoginPage_TC_007 | Functional | Web page | Verify 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 - 3.43 g.Research - No | Application should show 'You don't have a chance!' | Application should show 'You don't have a chance!' | Pass |

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 | 0 | 2 | 1 | 3 |
| Duplicate | 1 | 0 | 0 | 0 | 1 |
| External | 0 | 0 | 1 | 0 | 1 |
| Fixed | 0 | 1 | 1 | 0 | 2 |
| Not Reproduced | 0 | 1 | 0 | 0 | 1 |
| Skipped | 0 | 0 | 0 | 0 | 0 |
| Won't Fix | 0 | 1 | 0 | 0 | 1 |
| Totals | 1 | 3 | 4 | 1 | 9 |

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 | 10 | 0 | 3 | 7 |
| Enter the scores | 20 | 0 | 3 | 17 |
| Click Submit button | 2 | 0 | 0 | 2 |
| Image displayed | 10 | 0 | 4 | 6 |
| Selecting from Drop down | 5 | 0 | 0 | 5 |
| Final Report Output | 30 | 0 | 10 | 20 |
| Version Control | 5 | 0 | 2 | 3 |

9. RESULTS

Performance Metrics

| S.No. | Parameter | Values | Screenshot |
|-------|----------------|--|--|
| 1. | Metrics | Regression Model: MAE - 0.0530887499999999, MSE - 0.005890691124999996, RMSE - 0.07675083794330845, R2 score - 0.6045653205836166 | <pre>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))</pre> <p> Mean Absolute Error: 0.05308874999999998 Mean Squared Error: 0.005890691124999996 Root Mean Squared Error: 0.07675083794330845 r2 score: 0.6045653205836166 </p> |
| 2. | Tune the Model | Hyperparameter Tuning – Cross Validation Validation Method – GridSearchCV method | <pre>print(best_grid.score(X_test, y_test))</pre> <p>0.7752131291397252</p> |

Mean Absolute Error: 0.0530887499999999 Mean Squared Error: 0.005890691124999996
Root Mean Squared Error: 0.07675083794330845 r2 score: 0.7102742554605375

Best grid score : 0.7752131291397252

10. ADVANTAGES

- It helps student for making decision for choosing a right college.
- Here the chance of occurrence of error is less when compared with existing system.
- It is fast, efficient and reliable.
- Avoids data redundancy and inconsistency.
- Very user-friendly.
- Easy accessibility of data.
- It would be the easiest mode to predict the university/colleges person is applicable for as well as it would be unbiased and totally transparent.
- Individually would no more need to depend upon the consultancies who may be slightly deviated towards the list of colleges/university that may be having contract with them.
- Moreover applying to only that colleges/university where the student has genuine chance would even reduce application process.
- Additionally living expense of the area where colleges/university is located would also be provided on website.

DISADVANTAGES

- Required active internet connection.
- System will provide inaccurate results if data entered incorrectly.
- Other factors such as changes in policies by the university or by the country can also affect 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 is not modeled by our system.

11. CONCLUSION

Student admission problem is very important in educational institutions. In this project addresses machine learning models to predict the chance of a student to be admitted. This will assist students to know in advance if they have a chance to get accepted. In this paper, 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 neighbor, random forest, and Multi layer Perceptron. Experiments show that the Multi layer 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.

12. FUTURE SCOPE

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

- This can be implemented in less time for proper admission process.
- This can be accessed anytime anywhere, since it is a web application provided only an internet connection.
- The user had not need to travel a long distance for the admission and his/her time is also saved as a result of this automated system.
- The scope of this project is a web application that allows users to enter their academic data and get predictions of their chances of admissions in the university tier of their choosing.
- It also provides an analysis based on the data set used that shows how the different affect chances of admissions.
- A Database will also be implemented for the system so that students can save their data and review and edit it as they progress with the most recent predictions being saved with their profile.
- Future work in the project could include weighing in the features that have been ignored as of yet like percentage seats for Foreign Students.
- Other criterion's like Co-curricular achievements, Leadership positions held, job experience etc can also be included as metrics for the model.

13. APPENDIX

Source Code

```
1  import pickle
2  from flask import Flask , request, render_template
3  from math import ceil
4  app = Flask(__name__)
5  model = pickle.load(open("model.pkl","rb"))
6
7  @app.route('/')
8  def index():
9      return render_template('index.html')
10
11 @app.route('/predict',methods = ['GET','POST'])
12 def admin():
13     gre=(eval(request.form["gre"])-290)/(340-290)
14     tofl=(eval(request.form["tofl"])-92)/(120-92)
15     rating=(eval(request.form["rating"])-1.0)/4.0
16     sop=(eval(request.form["sop"])-1.0)/4.0
17     lor=(eval(request.form["lor"])-1.0)/4.0
18     cgpa=(eval(request.form["cgpa"])-6.7)/(10.0-6.7)
19     research=request.form["research"]
20     if (research=="Yes"):
21         research=1
22     else:
23         research=0
24     preds=[[gre,tofl,rating,sop,lor,cgpa,research]]
25     xx=model.predict(preds)
26     if (xx>0.5):
27         return render_template("chance.html",p=str(ceil(xx[0]*100))+"%")
28     return render_template("nochance.html")
29 if __name__ == '__main__':
30     app.run(debug = False, port=4000)
```

13.2 Github & Project Demo Link

Github Link: <https://github.com/IBM-EPBL/IBM-Project-42692-1660705650>