University Admit Eligibility Predictor

Professional Readiness for Innovation, Employability and Entrepreneurship

Team ID: PNT2022TMID13046

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1. INTRODUCTION

Students are often worried about their chances of admission to University. The aim of this project is to help students in shortlisting universities with their profiles.The predicted output gives them a fair idea about their admission chances to a particular university.This analysis should also help students who are currently preparing or will be preparing to get a better idea. College admission predictor is a boon to many students. This helps the student not only to help in filling out theapplication forms but also give the students an idea about their future college by calculating their cut off.

When students come from rural places , they find it hard to go along with the formal procedures. So, this application helps them a lot and eases out their fear. Whatever may be their scores , this application helps to find the best colleges . Hence, our proposed computer aided system which help the students to get the list of all colleges in which they could get the admission at the click of a button. The students only have to enter their marks of XII, AIEEE etc. With this application, the students can very easily obtain the list of colleges even branch wise and course wise. This will not only make the admission process easy but also minimizes stress for students . The main objective of our system is to make the right choice of colleges. Recommending best suitable universities to students based on their GRE, GPA and TOEFL scores and also predicting admission probability.

1.1 Project Overview

The university prediction mostly depends the initial steps that are being carried out. Firstly, the dataset collection. The data that is collected for the prediction must be accurate and concise in nature. Any discrepancies in the dataset will cost the accuracy of the university prediction directly. The second step is Data preprocessing. The collected data is improper i.e., those data will have outliers, missing values and the number of attributes may also be huge. At times the data can also be unstructured. In order to solve this issue, the data must be cleaned and preprocessed in a proper manner. The next important issues arise with the data consistency, the university prediction data must be consistent. The data format must be same across all the dataset. These inconsistencies must be solved before training the model with the data. The issue also occurs due to abnormalities. The model cannot predict the in these abnormalities.

1.2 Purpose

The university prediction may help the school student's hugely to predict good possibility of good college. This university prediction can help the students hugely to plan ahead and save their valuable time. The reputation of the university can be majorly dependent on these university prediction because the prediction has a direct hand in determining the society trust on the application. Proper data preprocessing helps the model to get a high yield accuracy.

2. LITERATURE SURVEY

2.1 Existing problem

S.No	Title	Author and year of Publication	Proposed Work	Limitations
1.)	Predicting Undergraduate Admission	Md. Protikuzzaman et al[1] [2020]	The authors begin by gathering information from Bangabandhu University of Science and Technology of Sheikh Mujibur Rahman (BSMRSTU). They pre-process the data after gathering it. Feature extraction from the data. After that, they use supervised machine training, data validation, and extraction techniques for learning understanding from it.	Error percentages are lower because of k-fold cross-validation

2.)	College Admission Prediction using Ensemble Machine Learning Models	Vandit Manish Jain et al[2] [2021]	This paper states that, One can enter their scores in the proposed system by the corresponding fields offered. After that, the system performs the data entered generates a list of the results of colleges that a person's results might qualify them for. we have suggested an innovative technique using algorithms for machine learning. To increase the our model's accuracy, we have included not only Several machine learning algorithms, not just one.	It gives ambiguous result if unequal observations are present in dataset.
3.)	College Admission Predictor	Annam Mallikharjuna Roa et al[3] [2018]	This paper illustrates a model of developing a model with security based classification model which tells the student's class admission based on advanced machine learning techniques such as k-means , naïve based technioques.	It does not include all the desired features.

4.)	Prediction Probability of Getting an admission using ml	A.Sivasangari et al[4] [2021]	In this paper, the modelling dataset has the following appearance. Preprocessing is an essential stage of the process. Choosing how to handling missing data is a typical issue in data cleaning. After cleaning , prediction done.	The most important feature is only considered for prediction
5.)	Engineering & Technology Admission Analysis And Prediction	Mr. Sachin Bhoite et al[5] [2021]	This paper aims in helping students to select engineering college for first year based on marks.For achieving that , they used machine learning algorithms such as k nearest neighbour , decision tree classifier.	Tuning the model is essential for better accuracy.
6.)	Graduate admission predicting using machine learning	Ali bou nasif[6][2020]	In this paper , they assist in advance prediction for student gettting into a college.The algorithms used here are multiple linear regression , multilayer perceptron.	Larger dataset is required to train the model to give best performance
7.)	College Admission Predictor and	Kiran Kumari et al [7] [2019]	This paper illustrates to generate probability to predict yes or no. This is done using filters and	The process of data feeding is manual and prediction is

			several preprocessing steps. Several analysis of algorithms done and they are compared to get a optimised and well defined class lables.	limited to certain region only.
	Smart List Generator			
8.)	Hybrid recommend system for college prediction	Abdul hamid et al[8][2020]	This paper aims at construction of trusted recommendation system based data mining techniques and frame rules to predict the enrollment of student's admission. Based on parameters like capacity, course rate, student's score and classify them accordingly.	The real students data was used from KAU, so the design is not generic.

2.2 References

[1]   Md. Protikuzzaman, Mrinal Kanti Baowaly , Maloy Kumar Devnath , Bikash Chandra Singh," Predicting Undergraduate Admission: A Case Study in Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Bangladesh", (IJACSA) International Journal of Advanced Computer Science and Applications, Vol. 11, No. 12, 2020

[2]   Vandit Manish Jain, Rihaan Satia," College Admission Prediction using Ensemble Machine Learning Models", International Research Journal of Engineering and Technology (IRJET), Volume: 08 Issue: 12 | Dec 2021

[3]   Annam Mallikharjuna Roa , Nagineni Dharani , A. Satya Raghava , J. Buvanambigai , K. Sathish," College Admission Predictor", Journal of Network Communications and Emerging Technologies (JNCET), Volume 8, Issue 4, April (2018)

[4]   A.Sivasangari, V.Shivani , Y.Bindhu, D.Deepa, R.Vignesh, "Prediction Probability of Getting an Admission into a University using Machine Learning", Proceedings of the Fifth International Conference on Computing Methodologies and Communication (ICCMC 2021) IEEE Xplore Part Number: CFP21K25-ART

[5]   Sachin Bhoite, Ajit More, "Engineering & Technology admission analysis and prediction", Article published at: https://www.researchgate.net/publication/341740217 ,May 2020 DOI: 10.37896/GOR33.02/181

[6]   Ali Bou Nassif ,Ismail Shahin ,Ashraf M Elnagar, "Graduate admission predicting using machine learning", Article published at: https://www.researchgate.net/publication/348433004, December 2020 DOI: 10.46300/91013.2020.14.13

[7]   Kiran Kumari, Meet Kataria, Viral Limbani, Rahul Soni,"CAPSLG: College Admission Predictor and Smart List Generator ", 2nd International Conference on Advances in Science & Technology (ICAST-2019) K. J. Somaiya Institute of Engineering & Information Technology, University of Mumbai, Maharashtra, India

[8]   Ragab, A.H.M.," Hybrid recommender system for predicting college admission", Intelligent Systems Design and Applications (ISDA), 29 Nov. 2012, 107-113.

2.3 Problem Statement Definition

University education is becoming a critical pillar of social and economic life in the twenty-first century. It is crucial not only in the educational process but also in assuring two vital things: a great job and financial stability. Predicting university entrance, on the other hand, might be extremely challenging because pupils are unaware of the admission standards. This University admission predictor most often helps the students in getting the chances of good college. This university prediction can help the students hugely to plan ahead and save their valuable time. The reputation of the university can be majorly dependent on these university prediction because the prediction has a direct hand in determining the society trust on the application.

3. IDEATION & PROPOSED SOLUTION
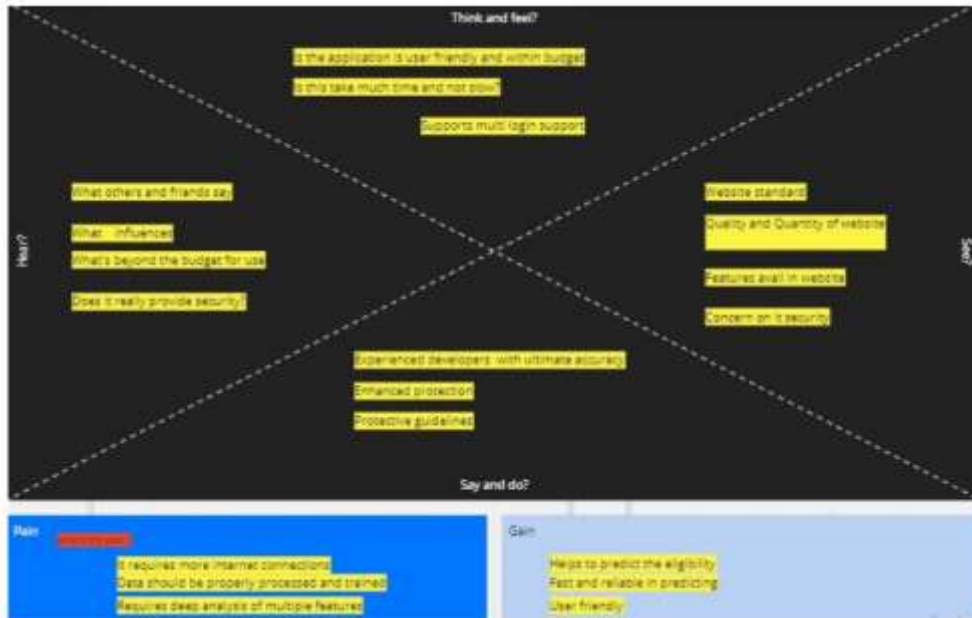
3.1 Empathy Map Canvas

Figure 3.1 Empathy map

This Figure 3.1 shows a empathy map that will gives a collaborative visualization for the end user, what they can perform using this project, what challenges have been faced and also what is the real time use for this application.

3.2 Ideation & Brainstorming

3.2.1 Brainstorm

Brainstorming phase, the ideas from every group members are gathered.

Figure 3.2 Brainstorm

3.2.2 **Group ideas**

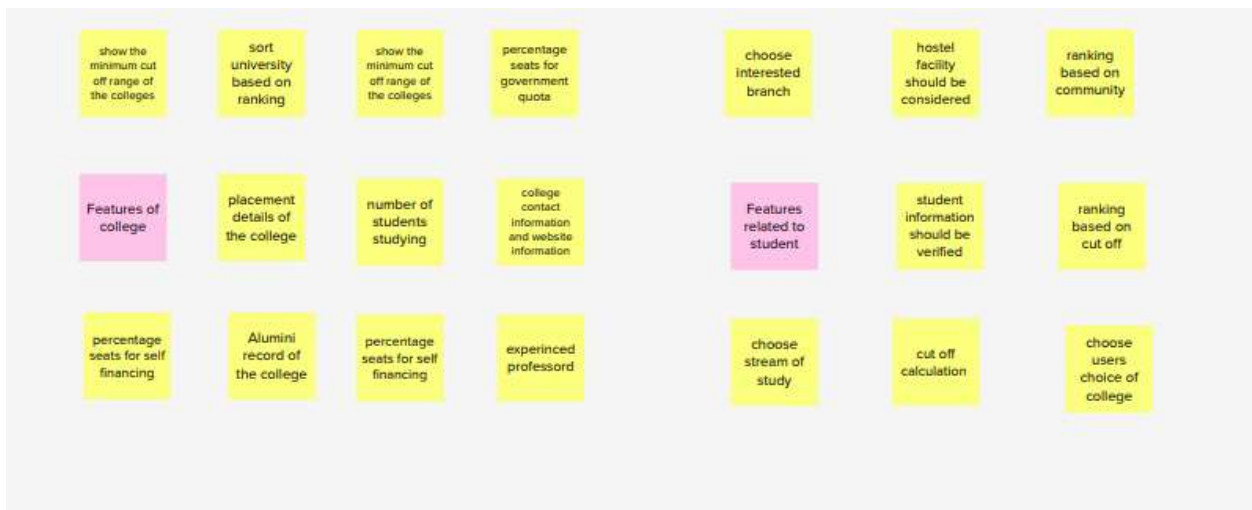Grouping the ideas under the suitable topics for better understanding

Figure 3.3 Group ideas

3.2.3 **Prioritize**

Prioritizing the ideas or the features and performing the feasibility study on it.
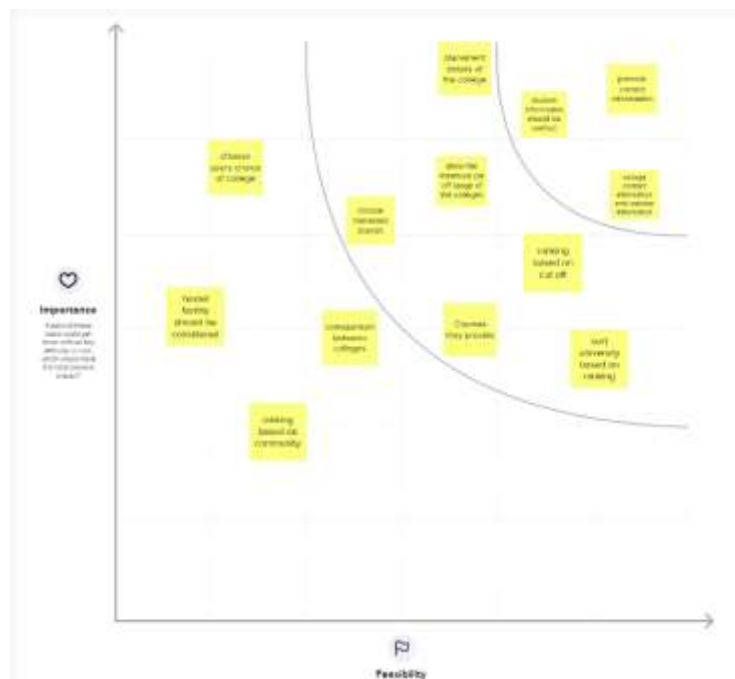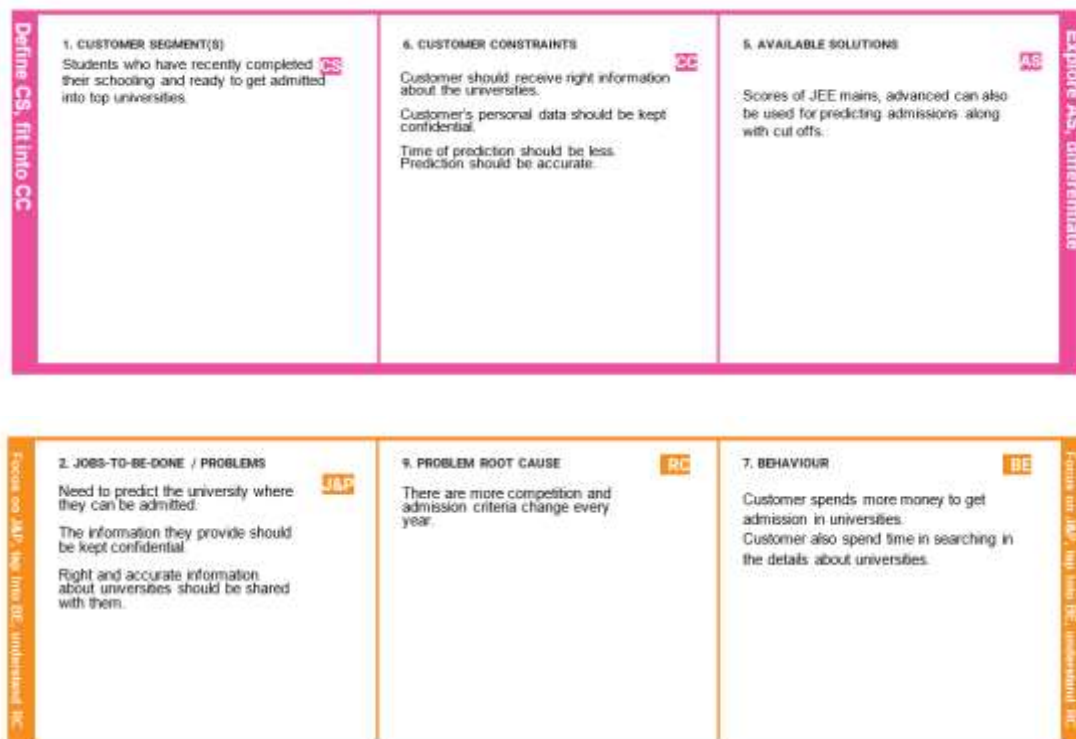

Figure 3.4 Prioritize

3.3 Proposed Solution

The main objective of the model is to predict university admission accurately and efficiently inorder to help students in selecting college. Using a machine learning model, university admission for college is done. The input to the algorithm is rows of feature vector like marks or gpa , cut off , category etc. Then a decision tree and random forest is used to predict the eligibility of the student for that college / university. Unlike other models here, comparison of decision tree classifier with logistic regression and random forest classifier for various figures of merit is performed for better efficiency of prediction. The model used is where students will be able to use features of the app for free. If the application used with more students, it is planned to enhance for subscription for some features

3.4 Problem Solution fit

Figure 3.5 Problem solution fit

4. REQUIREMENT ANALYSIS

4.1 Functional requirement

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	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 - HSC/Diploma score - GRE score - TOEFL score - GATE score - IELTS score - CGPA etc.

FR-4	User Requirements	• Choose the tier of university they wish to apply and then get a prediction of their chances ofadmission 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 bestored 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.

4.2 Non-Functional requirements

Following are the non-functional requirements of the proposed solution

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	• No training is required to use thewebsite. • The form, home, about, FAQ and analysis pages load up within 10 seconds. • The results from the predictor should nottake more than 30 seconds.
NFR-2	**Security**	• The system shall provide password protected access to the website to all users –students & admins both.

NFR-3	**Reliability**	• University Application process itself being a tedious task students needs lots of determination for completing overall application process.
		• It seems students have to work on lots ofthings when he/she prepares for application process.
		• It would definitely be easier for studentsif they get relief from step of selecting best suited universities and colleges for application.
		• This would encourage them to work vigorously on other application componentsso 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 beperformed.
		• Downtime after a failure shall not exceed24 hours.
NFR-4	**Performance**	• This system can support any number of users at a time.
		• The mean time to view a webpage overa 56 Kbps modem connection shall not exceed5 seconds.

NFR-5	Availability	• Easy access of data.
		• Avoids data redundancy andinconsistency.
		• It is fast, efficient and reliable.
		• Very user friendly.
		• Chances of occurrence of error is lesswhen compared to existing system.

5. PROJECT DESIGN

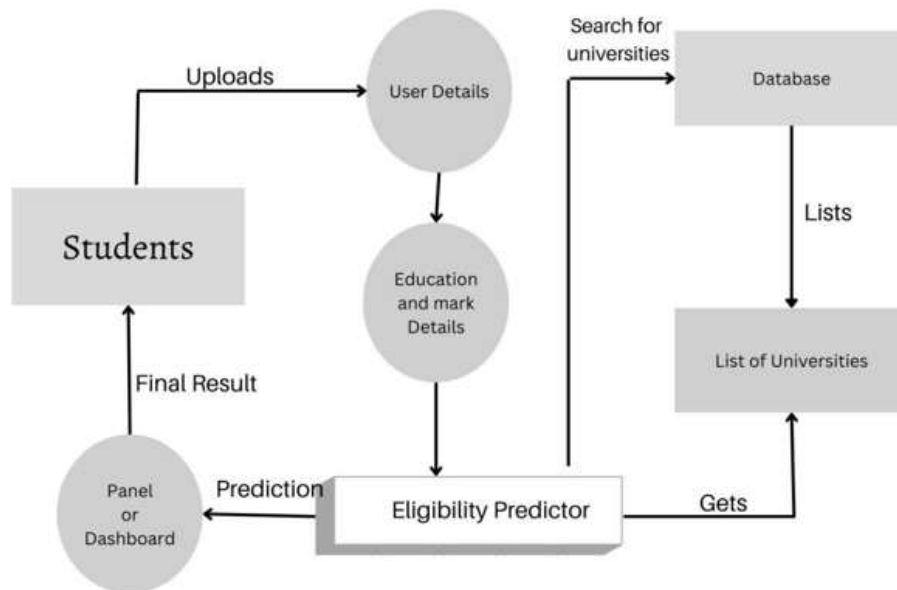## 5.1 Data Flow Diagrams

Figure 5.1 Data flow diagram

5.2 Solution & Technical Architecture
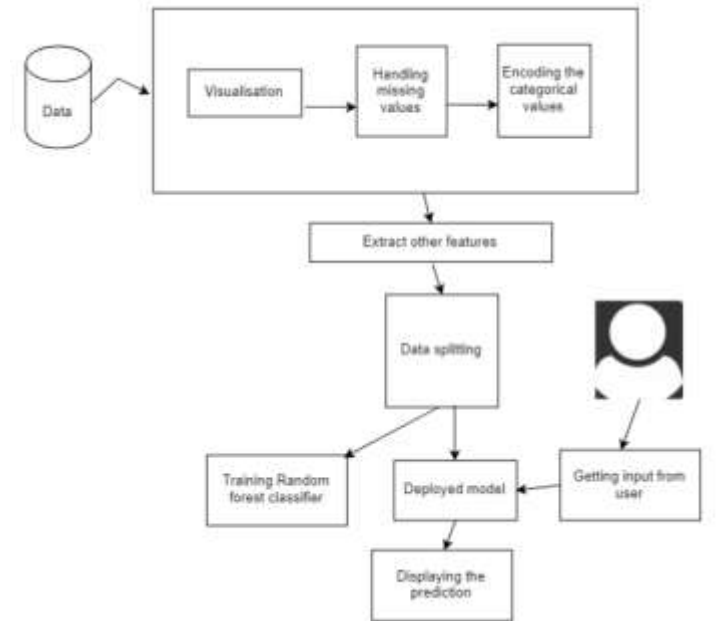
5.2.1 Solution Architecture

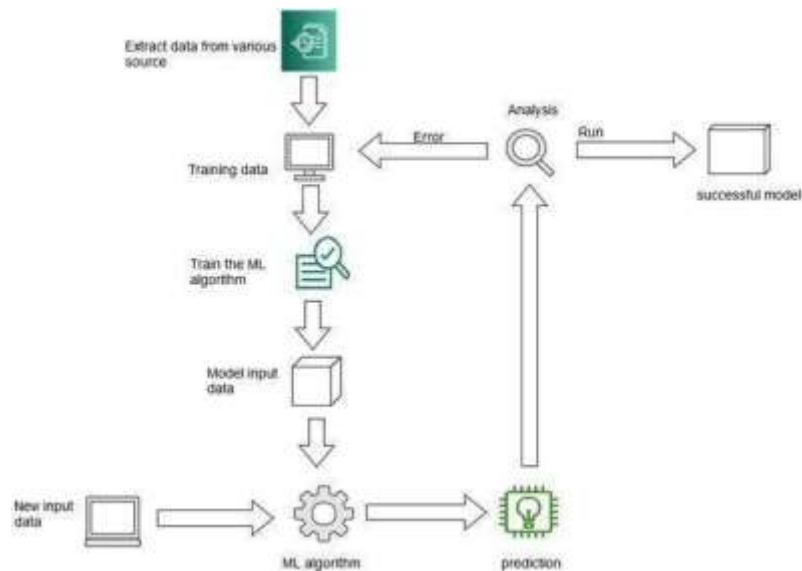**Figure 5.2 Solution architecture**

5.2.2 Technical Architecture

Figure 5.3 Technical architecture

5.3 User Stories

User Type	Functional Requirement(Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Student	Dashboard	USN-1	As a user, I can view the cut off marks of previous years in my dashboard	I can access and download the files	High	Sprint-1
		USN-2	As a user, I can view university details and their rankings	I can only view(read-only)	Medium	Sprint-1
		USN-3	As a user, I can review the experience of thestudents in the university	I can access the review sections	Medium	Sprint-2
		USN-4	As a user, I can upload my documents	I have read and write access to upload files	High	Sprint-1
		USN-5	As a user,I can fill out	I have read and write access to	High	Sprint-2

			the general and educational details in the form provided	the forms filled		
	Predictor	USN-6	I can view the list of universities in which I am eligible to get an admission	I can receive the final result as whether eligible or not	High	Sprint-2
		USN-7	I can view the list of universities I am eligible with the same cut-off but in previous years	I can access the files with read-only permission	Medium	Sprint-2
Administrat or	Dashboard	USN-8	As an administrator,I can have access to update the latest updates of the universities	I can have access to read and write the university information in the dashboard	High	Sprint-3
		USN-9	As an administr ator,I can	I can access the resources that are	Medium	Sprint-3

			access any resources available in the page	available		
		USN-10	As an administrator,I can have a track on the universities the student is eligible to get admission at	I can access the list of the universities obtained as final result	High	Sprint-3

6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Point	Priority	Team Members
Sprint -1	Registration and Login	USN-1	As a new user, I can register for the application by entering my email and my password.	2	High	Parthiban
Sprint -2	Confirmation email	USN-2	As a user, I will receive confirmation email once I have registered for the application	2	Medium	Vinith
Sprint -1	User login	USN-3	As a user, I can login into the application by entering the registered email-id and password	2	High	Tharmentheran
Sprint -2	Admin Panel	USN-4	As an admin, I can authenticate the registration and login	2	High	Sandiyaa

			credentials of the passengers			
Sprint -3	University availabilities	USN-5	As a user, I can find all the details of a specific universities	2	High	Parthiban
Sprint -3		USN-6	As a user, I can find exactly how long the flight will be delayed	2	High	Vinith
Sprint -4	Helpdesk	USN-7	As a customer care executive, I can provide the contact details of the airlines	1	Medium	Tharmentheran
Sprint -4		USN-8	As a student, I can see the universities with similar name	1	High	Sandiyaa
Sprint -4	Feedback	USN-9	As a user, I can provide my suggestions and feedback for the improvement of the application	2	Medium	Sandiyaa

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

6.2.1 Velocity

We have a 24-day sprint duration, and the velocity of the team is 4 (points per sprint). Thus the team's average velocity (AV) per iteration unit (storypoints per day) is as follows

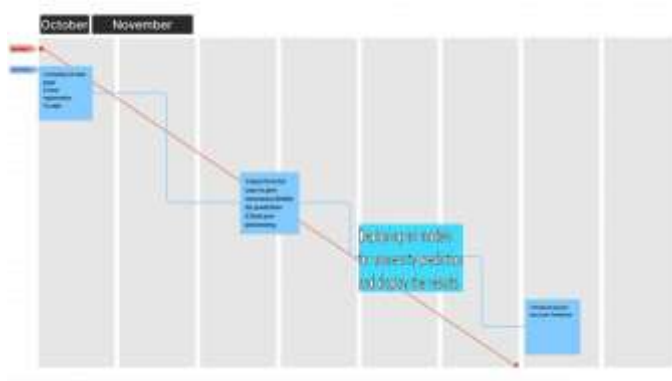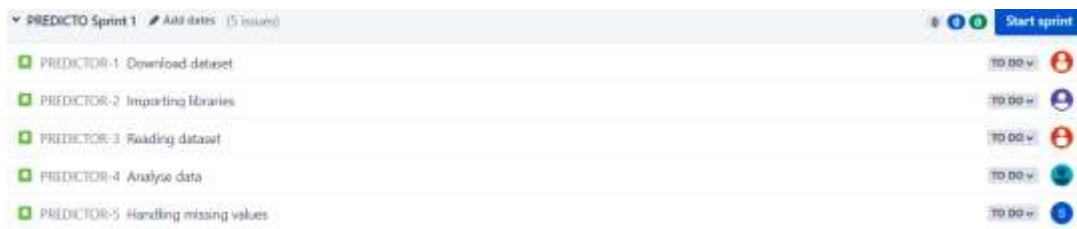AV = sprint duration / velocity= 24/16 $=$ 1.5

6.2.2 BurnDown chart

Figure 6.1 BurnDowm chart

6.3 Reports from JIRA

Figure 6.2 Sprint 1

Figure 6.3 Sprint 2

Figure 6.4 Sprint 3

Figure 6.5 Sprint 4

7. CODING & SOLUTIONING

7.1 Feature 1

The application's registration page is created. User registration is carried out if the user hasn't already done so. Enough work was put into making this process seamless. If the user has registered, he can now log in directly. Email address, name, and password were required for registration. The code to link it to the backend was successful, and this data is stored in Firebase.

7.2 Feature 2

The trained machine learning model can predict the output from an image that is uploaded, and the nutrition facts are also displayed on the same page.

7.3 Database Schema

The Firebase platform was used. A mechanism for storing and retrieving data that is modelled in ways other than the tabular relations used in relational databases is provided by the Firebase database (NoSQL).

This is the logical code which accepts the input from the user and the model predicts whether the user is eligible or not.

```
//
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]
                   }]
}
```

```python
@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"))

const disableButton = () => {
    console.log('Submitting form...');
    button.disabled = true;
    button.className = "btn btn-outline-primary";
    button.innerHTML = "Predicting..."
    loading.style.display = "block"
};

const enableButton = () => {
    console.log('Loading window...');
    button.disabled = false;
    button.className = "btn btn-primary"
    button.innerHTML = "Predict"
    loading.style.display = "none"
}
```
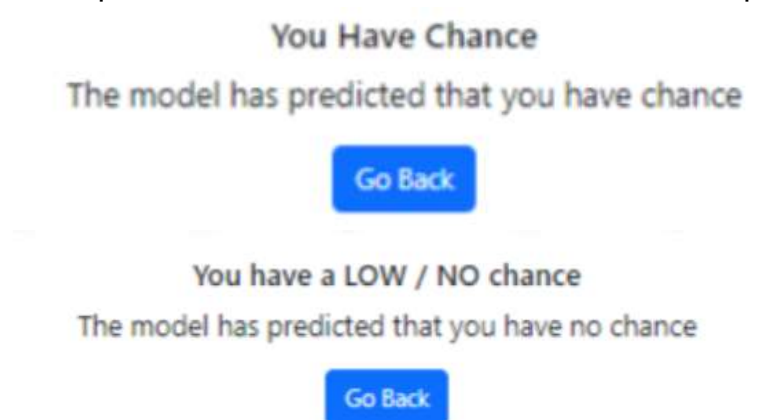
Model predicts chance or no chance based on the input parameters

You Have Chance

The model has predicted that you have chance

Go Back

You have a LOW / NO chance

The model has predicted that you have no chance

Go Back

8. TESTING

8.1 Test Cases

The test cases include invalid email and unrecognizable images. For the image part, a text file or other format files were uploaded as a corner case.

8.2 User Acceptance Testing

Users in our college were tested with the application about the eligibility criteria.

8.3 Integration Testing

This combined and tested both the registration and prediction modules, which showed to provide accurate results.

9. RESULTS

9.1 Performance Metrics

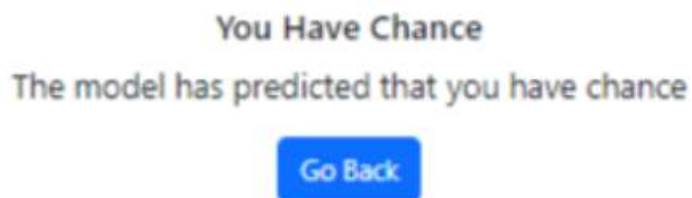**Figure 9.1 Eligibility inputs**

Figure 9.2 Predicted result

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10. ADVANTAGES & DISADVANTAGES

10.1   Advantages

- The above model yields high classification accuracy
- It can train and test on very large datasets.
- It predicts the output efficiently

10.2   Disadvantages

- The proposed model is computationally expensive to train and test.
- The neural network architecture used in this project work is highly complex.

11. CONCLUSION

The model here involves classifying images from datasets of gre score, toefl score. The number of epochs was increased to boost categorization accuracy. Different classification accuracies are obtained for different batch sizes. The accuracies are increased by adding more convolution layers. The accuracy of classification is also increased by adjusting the number of dense layers. The accuracies are different while varying the size of the train and test datasets.

12. FUTURE SCOPE

The model currently uses is to predict the eligibility of a student for getting chance for a college. This can be expanded to integrate with preexisting history of college chance results which helps the user to get clarification. This project's work can be expanded to include security applications including face, iris, and figure print recognition.

13. APPENDIX

Source Code

GitHub & Project Demo