1. INTRODUCTION

1.1 PROJECT OVERVIEW

University and college admission is a complex decision process that goes beyond simply matching test scores and admission requirements. For an aspiring graduate student, choosing which universities to apply to is a difficult problem. Often, the status wonders if their profile is good enough for a certain university. This project has addressed this problem lying a recommender system based on various classification algorithms.

The required data was obtained from thegradcafe.com. Based on this data set, various models were trained and one best and some other similar properties carrying universities are suggested for the students such that it maximizes the chances of a student getting an admit from that university list. Classification algorithms have also been used to predict the acceptance chance of any student at any individual university.

The project is implemented using a Machine-Learning model that predicts whether the user is eligible for admission to the selected rated universities with provided details such as marks and others. The algorithm works in such a way that when the user provides the details such as (GRE Score, TOEFL Score, University Rating, SOP, LOR, CGPA, Research, and h) the percentage of chance of admission is displayed. The user is provided with a UI (Web based application) in which the user can enter the details mentioned above for prediction.

1.2 PURPOSE

Our project helps students seeking admission to universities check their eligibility according to various parameters such as GRE, GPA, TOEFL, SOP, CGPA, and Research. students can view eligibility online mode without wasting money, time, and parental personnel working simply at the home.

Students from rural backgrounds find it difficult to analyze and prepare a preference list. This idea will be beneficial for them. Students who belong to multiple categories face difficulty analyzing cut-offs in each category and predicting the best colleges they can get admission to. 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 helps colleges too to recognize their stand in attracting students and finer prediction implies better results for the students.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

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 Networks Algorithms 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 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

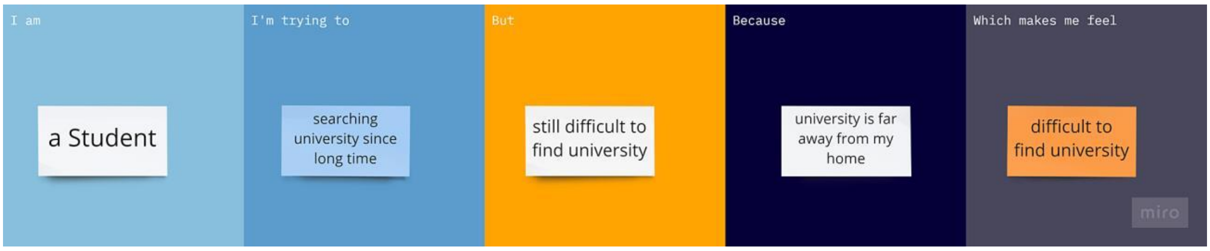
- L. Chang, Applying Data Mining to Predict College Admissions Yield, Chapter 4 in J. Luan and C. Zhao (Eds.), Data mining in action: Case studies, Spring 2008 - College of Education. Datamining technology's predictive modeling was applied to enhance the prediction of enrollment behaviors of admitted applicants at a large state university.
- Rensing Dong, The module of prediction of College Entrance Examination aspiration, Fuzzy Systems and Knowledge Discovery (FSKD), 31 May 2012 1559-1562. Many factors are involved in the prediction of College Entrance Examination (CEE) aspiration which is a non-linear classification problem. We proposed a CEE aspiration prediction approach based on a support vector machine learning algorithm. Firstly, CEE score and ranking in all subjects, the number of college admission plans, and relevant data of the latest two years are collected and a training set is formed.
- Data Visualization, Machine Learning:

https://www.analyticsvidhya.com/blog/2017/09/common-machin e learning-algorithms/

- Journal of Network Communications and Emerging Technologies(JNCET) Volume 8, Issue 4, April (2018) College Admission Predictor System is a web-based application system in which students can register their marks along with their personal information. This helps to predict their admissions to colleges. Administrators can add the college details and the batch details. Using this Application, the entrance seat allotment becomes easier and more efficient.

2.3 PROBLEM STATEMENT DEFINITION

Students are often worried about their chances of admission to University. This project aims 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.



I am

a Student

I'm trying to

searching university since long time

But

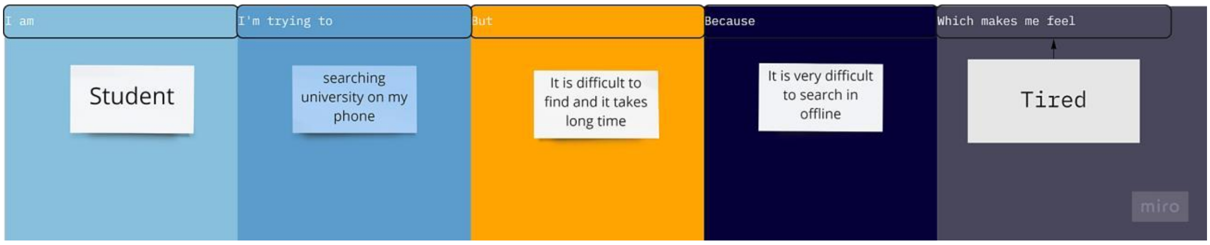
still difficult to find university

Because

university is far away from my home

Which makes me feel

difficult to find university



I am

Student

I'm trying to

searching university on my phone

But

It is difficult to find and it takes long time

Because

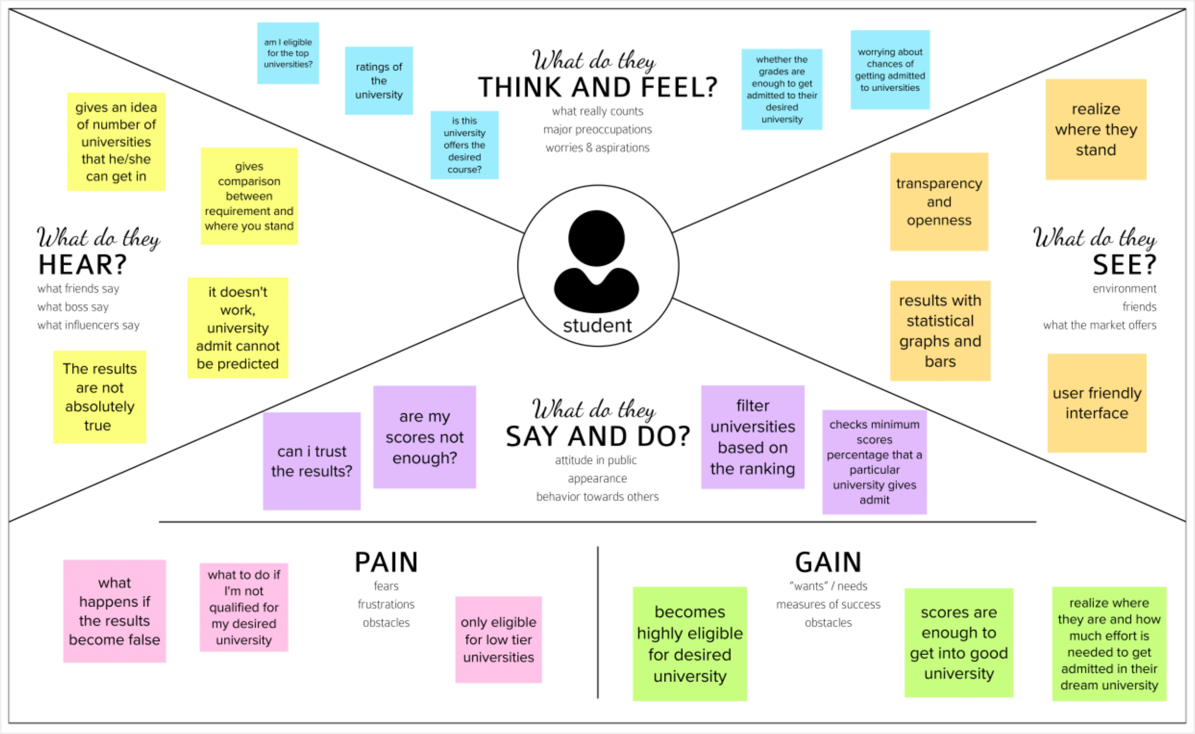
It is very difficult to search in offline

Which makes me feel

Tired

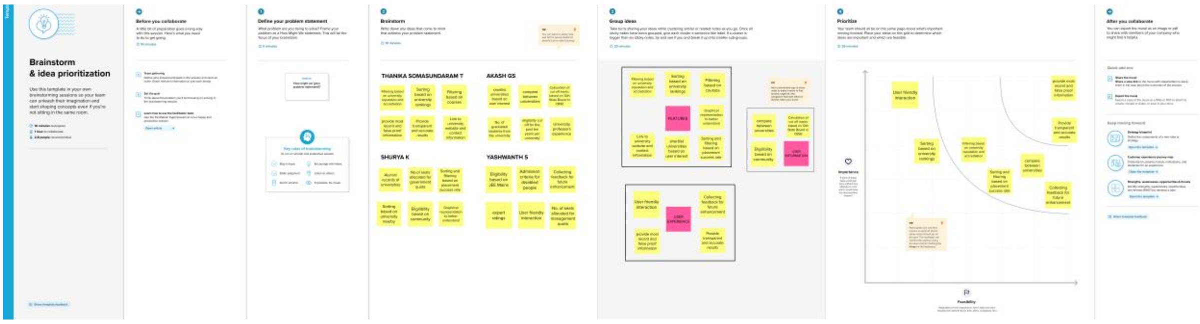
3. IDEATION AND PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS



What do they
THINK AND FEEL?
what really counts
major preoccupations
worries & aspirations
am I eligible for the top universities?
ratings of the university
is this university offers the desired course?
whether the grades are enough to get admitted to their desired university
worrying about chances of getting admitted to universities
What do they
HEAR?
what friends say
what boss say
what influencers say
gives an idea of number of universities that he/she can get in
gives comparison between requirement and where you stand
it doesn't work, university admit cannot be predicted
The results are not absolutely true
student
What do they
SEE?
environment
friends
what the market offers
realize where they stand
transparency and openness
results with statistical graphs and bars
user friendly interface
What do they
SAY AND DO?
attitude in public
appearance
behavior towards others
can i trust the results?
are my scores not enough?
filter universities based on the ranking
checks minimum scores percentage that a particular university gives admit
PAIN
fears
frustrations
obstacles
what happens if the results become false
what to do if I'm not qualified for my desired university
only eligible for low tier universities
GAIN
"wants" / needs
measures of success
obstacles
becomes highly eligible for desired university
scores are enough to get into good university
realize where they are and how much effort is needed to get admitted in their dream university

3.2 IDEATION AND BRAINSTORMING


Brainstorm
& idea prioritization
Before you collaborate
Define your problem statement
Brainstorm
THANIKA SOMASUNDARAM T
AKASH GS
SHURYA K
YASHWANTH S
Group ideas
FEATURES
USER INFORMATION
USER EXPERIENCE
Prioritize
Importance
Feasibility
User friendly interaction
Sorting based on university rankings
compare between universities
provide most recent and false proof information
Provide transparent and accurate results
Collecting feedback for future enhancement
Sorting and filtering based on placement success rate
After you collaborate

3.3 PROPOSED SOLUTION

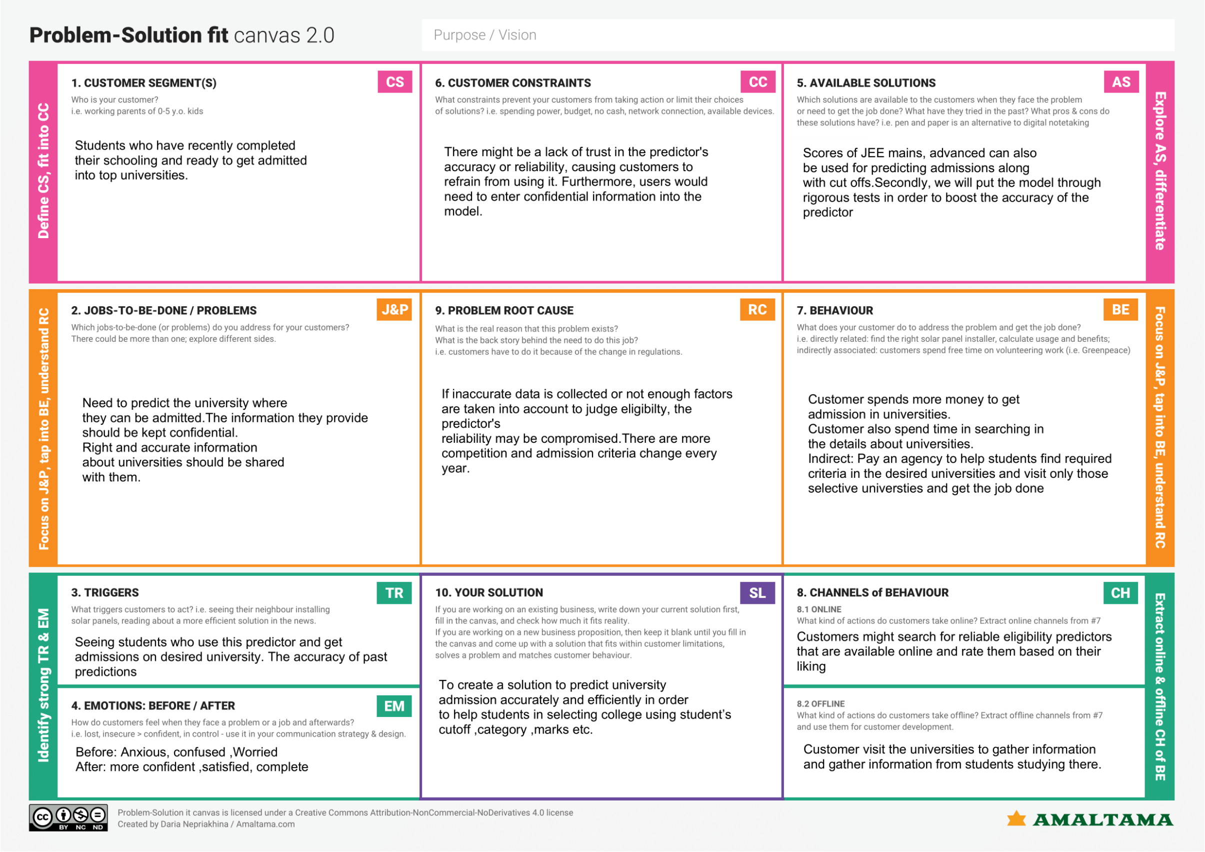
S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Choosing the right universities or colleges is what a Student has to face. Many students apply to universities in which they have little chance of acceptance. This leads students of poor economic backgrounds to frustration and anxiety as they only lose less amount of money just for applying to those universities
2.	Idea / Solution description	University and College research being part of the university application process is an arduous and lengthy task. This issue is a big issue for students and has not been solved till now. There are recognized sites that filter the best universities and colleges

		based on location, tuition fees, major, and degree but none of them have used machine learning algorithms to solve the issue. Hence, we have done this research project to solve that issue to some extent with the use of data mining techniques.
3.	Novelty / Uniqueness	The university application process itself is a tedious task Students need lots of endeavor and determination for completing the overall application process. It would be easier for students if they get relief from selecting the best-suited universities and colleges for application.
4.	Social Impact / Customer Satisfaction	The results of this project do not apply to college graduates of every major. As there was a limitation of information in the dataset this system could not predict and recommend universities to students of every major. Nevertheless, this project's statistical data mining techniques can apply to all applied universities that have insufficient data on the major chosen by the student it will return insufficient data for prediction to the user.

5.	Business Model (Revenue Model)	This project financially can earn from the student’s admission fees but they want to first select their selected college in prediction. Although this is done by this project for prediction. This project has addressed this problem by modeling a recommender system based on various classification algorithms. The required data was obtained from thegradcafe.com. Based on this data set, various models were trained and one best and some other similar properties carrying universities are suggested for the students such that it maximizes the chances of a student getting an admit from that university list.
6.	Scalability of the Solution	This project has addressed this problem by modeling a recommender system based on various classification algorithms. To predict the best University for a particular student his/her GPA score, GRE (Verbal and Quant) Score, and TOEFL score has been used as attributes for classification. K nearest neighbor has been used to predict the best universities and K means clustering

		has been used to find more similar universities. Support Vector Machine and Random forest has been used to predict the admission chance of a particular student at a specific University.

3.4 PROBLEM SOLUTION FIT


Define CS, fit into CC
Focus on J&P, tap into BE, understand RC
Identify strong TR & EM
Explore AS, differentiate
Focus on J&P, tap into BE, understand RC
Extract online & offline CH of BE
CS
CC
AS
J&P
RC
BE
TR
EM
SL
CH
AMALTAMA

Problem-Solution fit canvas 2.0

Purpose / Vision

1. CUSTOMER SEGMENT(S)

Who is your customer?
i.e. working parents of 0-5 y.o. kids

Students who have recently completed their schooling and ready to get admitted into top universities.

6. CUSTOMER CONSTRAINTS

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.

There might be a lack of trust in the predictor's accuracy or reliability, causing customers to refrain from using it. Furthermore, users would need to enter confidential information into the model.

5. AVAILABLE 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? i.e. pen and paper is an alternative to digital notetaking

Scores of JEE mains, advanced can also be used for predicting admissions along with cut offs.Secondly, we will put the model through rigorous tests in order to boost the accuracy of the predictor

2. JOBS-TO-BE-DONE / PROBLEMS

Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.

Need to predict the university where they can be admitted.The information they provide should be kept confidential.
Right and accurate information about universities should be shared with them.

9. PROBLEM ROOT CAUSE

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.

If inaccurate data is collected or not enough factors are taken into account to judge eligibilty, the predictor's
reliability may be compromised.There are more competition and admission criteria change every year.

7. BEHAVIOUR

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. Greenpeace)

Customer spends more money to get admission in universities.
Customer also spend time in searching in the details about universities.
Indirect: Pay an agency to help students find required criteria in the desired universities and visit only those selective universties and get the job done

3. TRIGGERS

What triggers customers to act? i.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.

Seeing students who use this predictor and get admissions on desired university. The accuracy of past predictions

4. EMOTIONS: BEFORE / AFTER

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.

Before: Anxious, confused ,Worried
After: more confident ,satisfied, complete

10. YOUR SOLUTION

If you are working on an existing business, write down your current solution first, fill in the canvas, 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 canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.

To create a solution to predict university admission accurately and efficiently in order to help students in selecting college using student’s cutoff ,category ,marks etc.

8. CHANNELS of BEHAVIOUR

8.1 ONLINE

What kind of actions do customers take online? Extract online channels from #7

Customers might search for reliable eligibility predictors that are available online and rate them based on their liking

8.2 OFFLINE

What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.

Customer visit the universities to gather information and gather information from students studying there.

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Created by Daria Nepriakhina / Amaltama.com

4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENTS

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	Submit the documents 1. GRE or/and TOEFL Score Sheet 2. Curriculum Vitae (CV) 3. Statement of Purpose (SOP) 4. Letter of Recommendation
FR-4	User Requirements	1. Upload all the relevant documents in the appropriate location on the website 2. Based on the uploads, the system would scrape all the necessary information 3. The list of all possible universities for the candidate would be displayed based on the scraped information

4.2 NON-FUNCTIONAL REQUIREMENTS

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	1. The system doesn't expect any technical pre-requisite from the user i.e.; even the naïve user can access it 2. The UI would focus on recognition over recall 3. User friendly 4. Reduced focus on Short Term memory load Focus on Internal Locus of Control 5. The page would not take a lot of time to load the content and display them (< 30 seconds) 6. The fields in the site would be self-explanatory
NFR-2	Security	1. Only the authenticated user would be able to utilize the services of the site. 2. Database should be backed

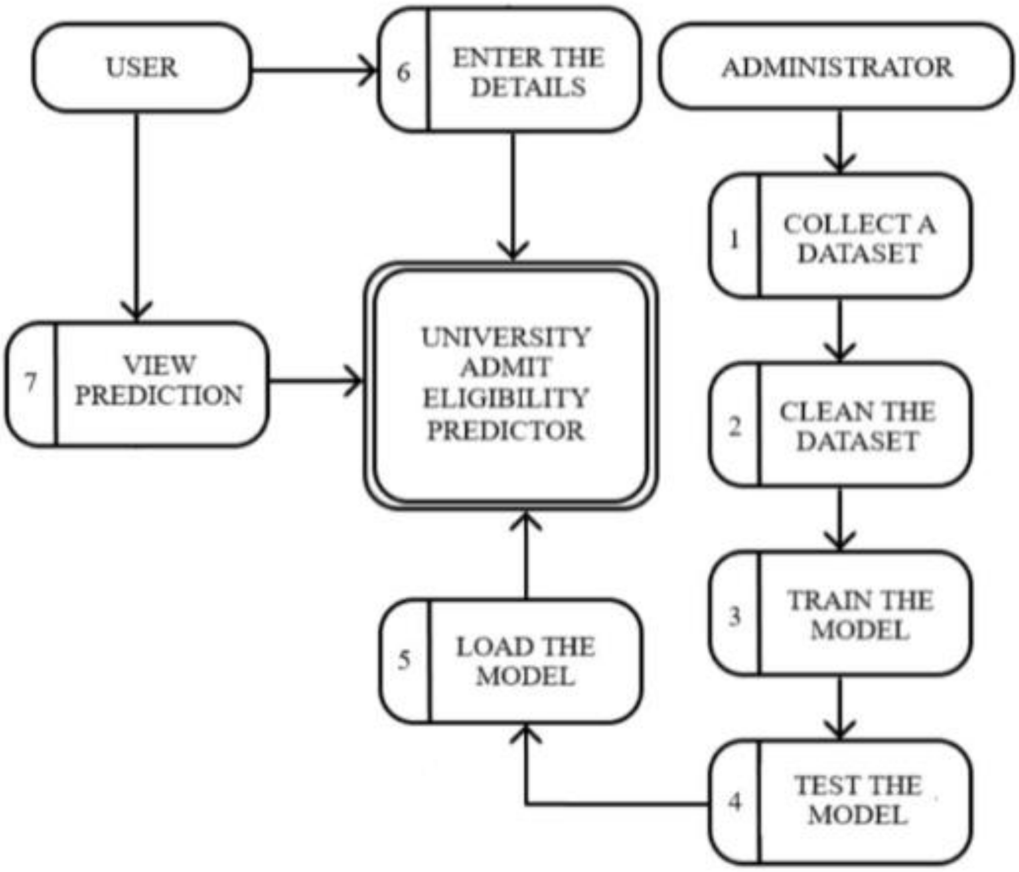
		up every hour

		Under any error, the system should be able to come back to normal operation in under an hour.
NFR-3	Reliability	1. The system would always strive for maximum reliability due to the importance of data and damages that could be caused by incomplete and incorrect data 2. The system will run 7 days a week, 24 hours a day
NFR-4	Performance	1. The website can efficiently handle the traffic by serving the request as soon as possible 2. Viewing this webpage using a 56-kbps modem connection would not exceed 30 seconds (quantitatively, in the meantime)
NFR-5	Availability	1. Minimal data redundancy 2. Less prone to errors 3. Fast and efficient

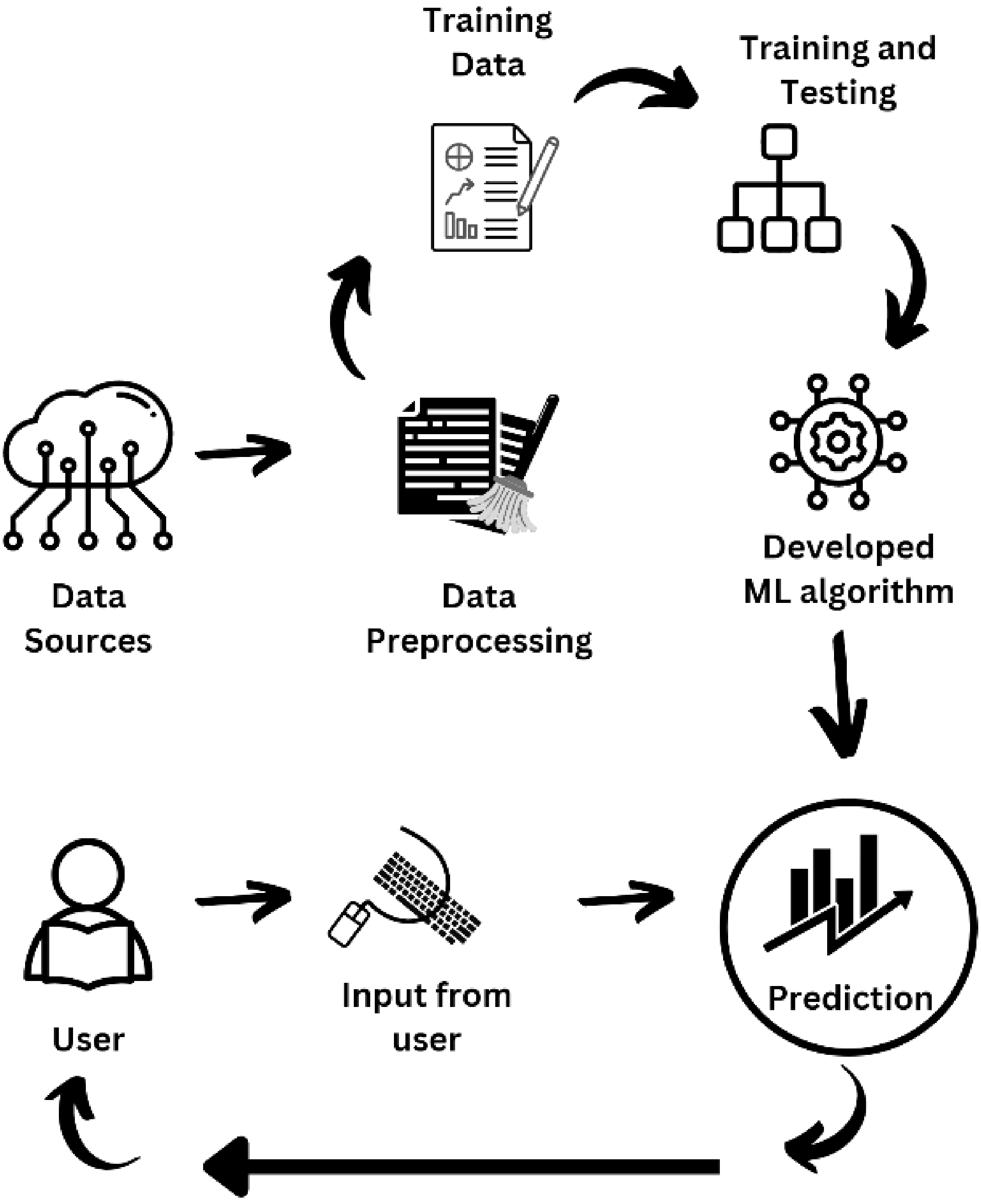
		4. The system will run 7 days a week, 24 hours a day
NFR-6	Scalability	1. Since an academic portal is crucial to the courses that use it, a sizable number of users must be able to access the system at the same time. 2. The admission season is probably when the system will be under the most strain. 3. It must therefore be able to manage numerous concurrent users.

5. PROJECT DESIGN

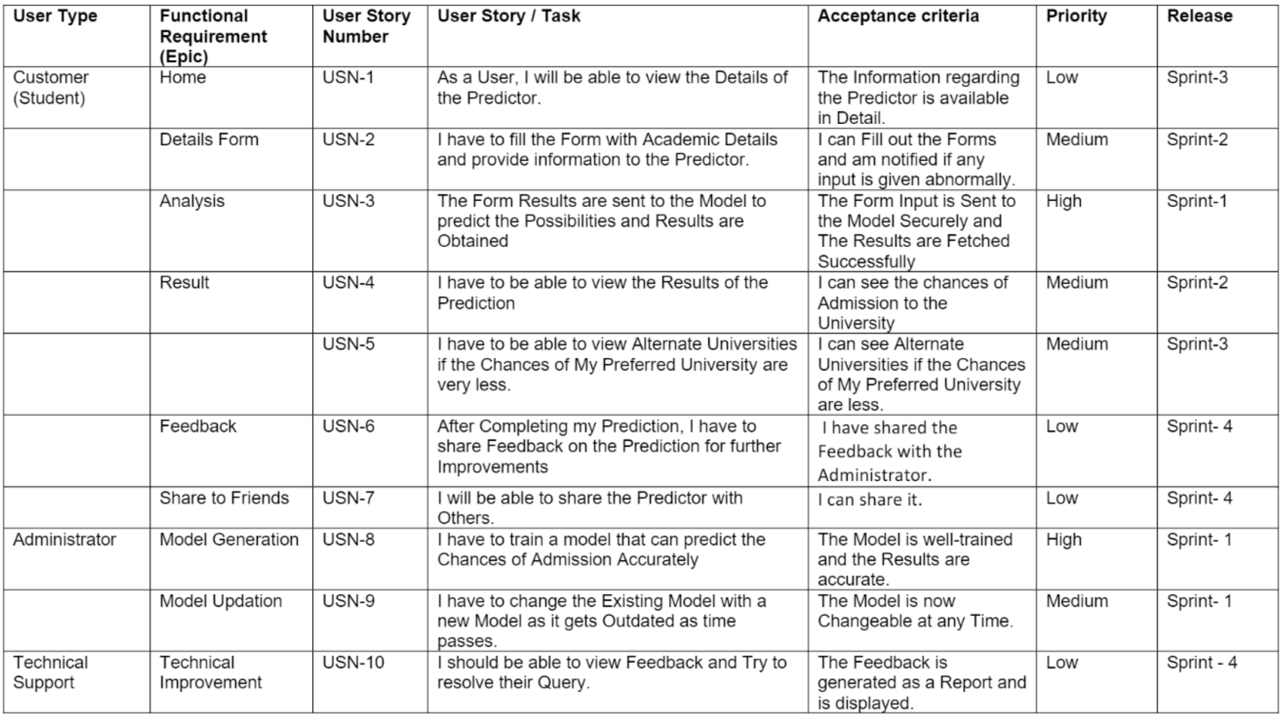
5.1 DATA FLOW DIAGRAM



5.2 SOLUTION AND TECHNICAL ARCHITECTURE



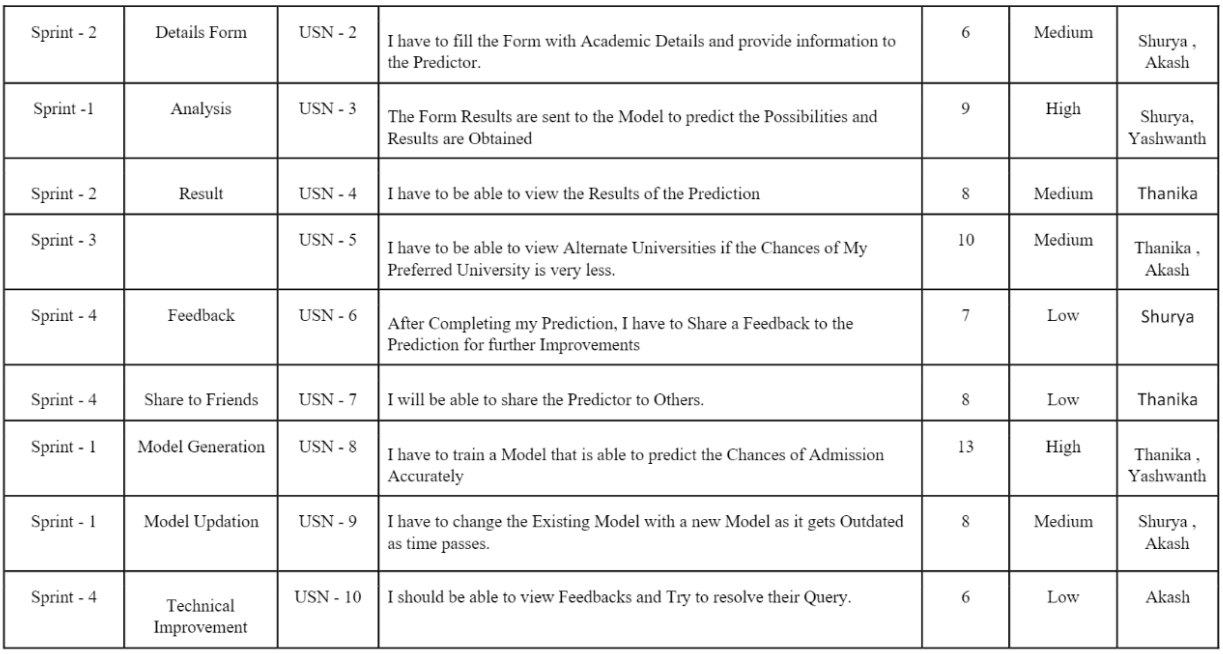
5.3 USER STORIES



User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Student)	Home	USN-1	As a User, I will be able to view the Details of the Predictor.	The Information regarding the Predictor is available in Detail.	Low	Sprint-3
	Details Form	USN-2	I have to fill the Form with Academic Details and provide information to the Predictor.	I can Fill out the Forms and am notified if any input is given abnormally.	Medium	Sprint-2
	Analysis	USN-3	The Form Results are sent to the Model to predict the Possibilities and Results are Obtained	The Form Input is Sent to the Model Securely and The Results are Fetched Successfully	High	Sprint-1
	Result	USN-4	I have to be able to view the Results of the Prediction	I can see the chances of Admission to the University	Medium	Sprint-2
		USN-5	I have to be able to view Alternate Universities if the Chances of My Preferred University are very less.	I can see Alternate Universities if the Chances of My Preferred University are less.	Medium	Sprint-3
	Feedback	USN-6	After Completing my Prediction, I have to share Feedback on the Prediction for further Improvements	I have shared the Feedback with the Administrator.	Low	Sprint- 4
	Share to Friends	USN-7	I will be able to share the Predictor with Others.	I can share it.	Low	Sprint- 4
Administrator	Model Generation	USN-8	I have to train a model that can predict the Chances of Admission Accurately	The Model is well-trained and the Results are accurate.	High	Sprint- 1
	Model Updation	USN-9	I have to change the Existing Model with a new Model as it gets Outdated as time passes.	The Model is now Changeable at any Time.	Medium	Sprint- 1
Technical Support	Technical Improvement	USN-10	I should be able to view Feedback and Try to resolve their Query.	The Feedback is generated as a Report and is displayed.	Low	Sprint - 4

6.PROJECT PLANNING AND SCHEDULE

6.1 SPRINT PLANNING AND ESTIMATION

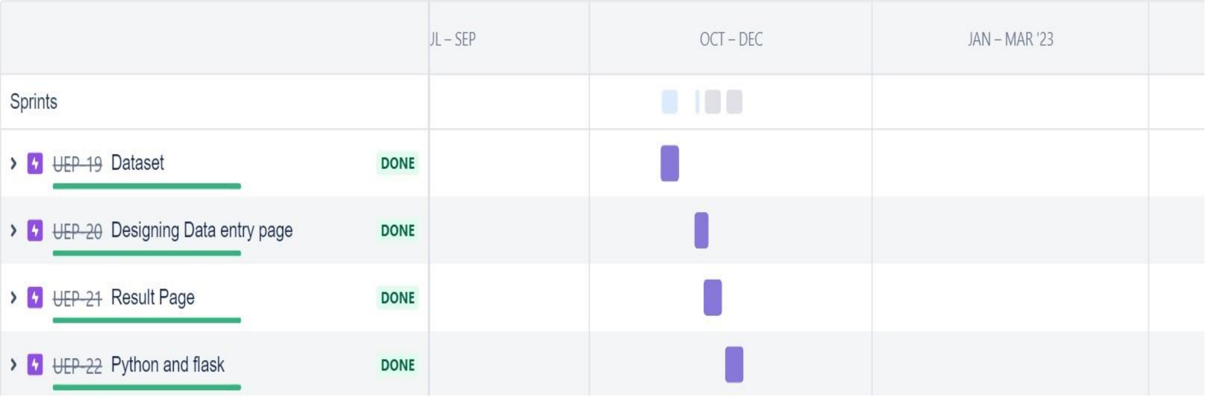


Sprint - 2	Details Form	USN - 2	I have to fill the Form with Academic Details and provide information to the Predictor.	6	Medium	Shurya , Akash
Sprint -1	Analysis	USN - 3	The Form Results are sent to the Model to predict the Possibilities and Results are Obtained	9	High	Shurya, Yashwanth
Sprint - 2	Result	USN - 4	I have to be able to view the Results of the Prediction	8	Medium	Thanika
Sprint - 3		USN - 5	I have to be able to view Alternate Universities if the Chances of My Preferred University is very less.	10	Medium	Thanika , Akash
Sprint - 4	Feedback	USN - 6	After Completing my Prediction, I have to Share a Feedback to the Prediction for further Improvements	7	Low	Shurya
Sprint - 4	Share to Friends	USN - 7	I will be able to share the Predictor to Others.	8	Low	Thanika
Sprint - 1	Model Generation	USN - 8	I have to train a Model that is able to predict the Chances of Admission Accurately	13	High	Thanika , Yashwanth
Sprint - 1	Model Updation	USN - 9	I have to change the Existing Model with a new Model as it gets Outdated as time passes.	8	Medium	Shurya , Akash
Sprint - 4	Technical Improvement	USN - 10	I should be able to view Feedbacks and Try to resolve their Query.	6	Low	Akash

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	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

6.3 REPORTS FROM JIRA

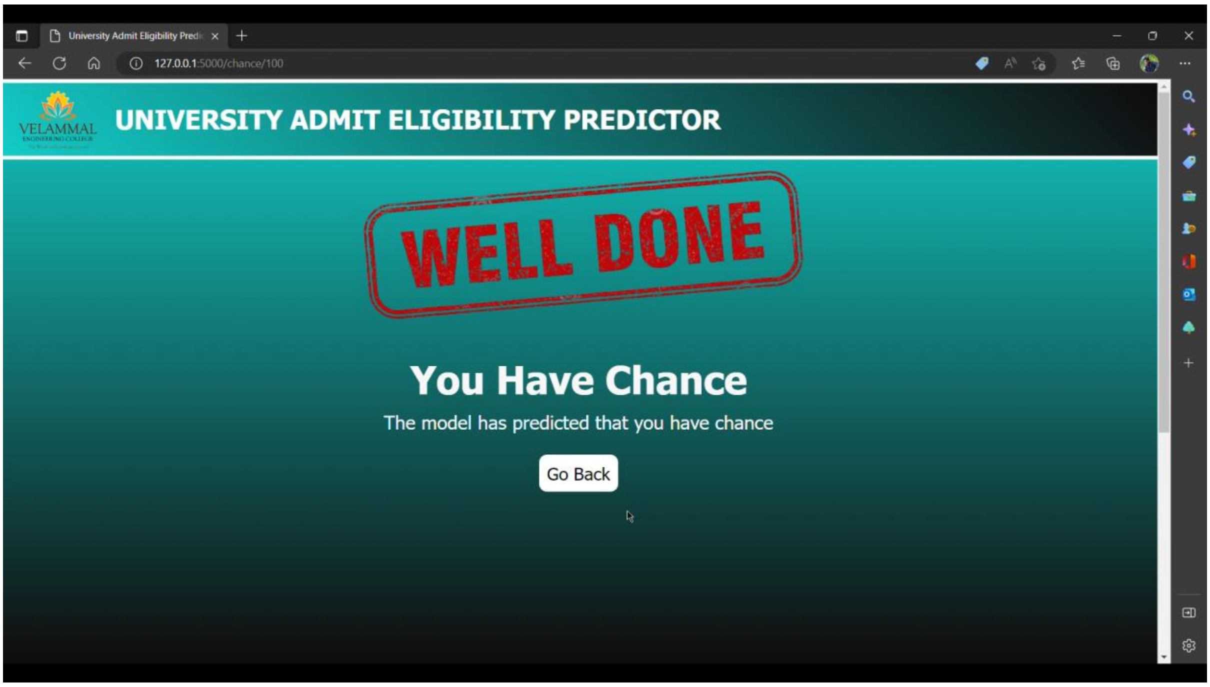


	JL – SEP	OCT – DEC	JAN – MAR '23
Sprints			
~~UEP-19~~ Dataset DONE			
~~UEP-20~~ Designing Data entry page DONE			
~~UEP-21~~ Result Page DONE			
~~UEP-22~~ Python and flask DONE			

7. CODING & SOLUTIONING

7.1 FEATURE 1

The new feature will predict the chances of admission to the university. The feature was designed in the HTML code connected with app.py as the backend.



University Admit Eligibility Predi

127.0.0.1:5000/chance/100

UNIVERSITY ADMIT ELIGIBILITY PREDICTOR

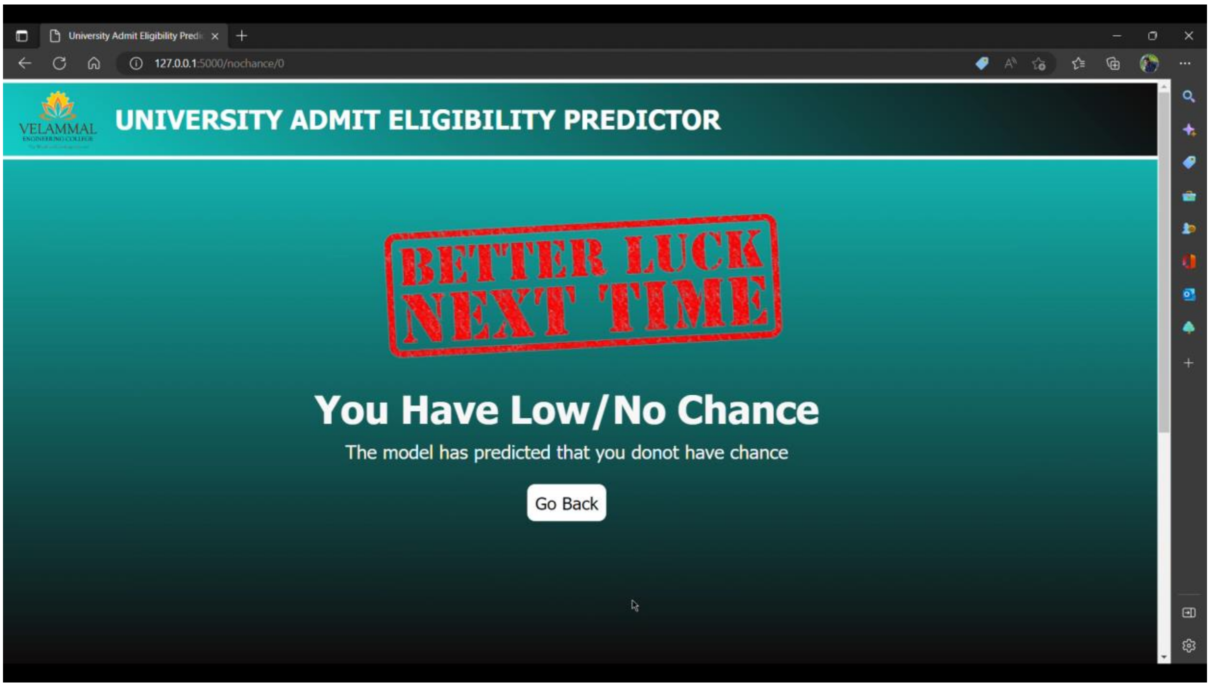
WELL DONE

You Have Chance

The model has predicted that you have chance

7.2 FEATURE 2

The new feature will predict the low chances of admission to the university. The feature was designed in the HTML code connected with app.py as the backend.

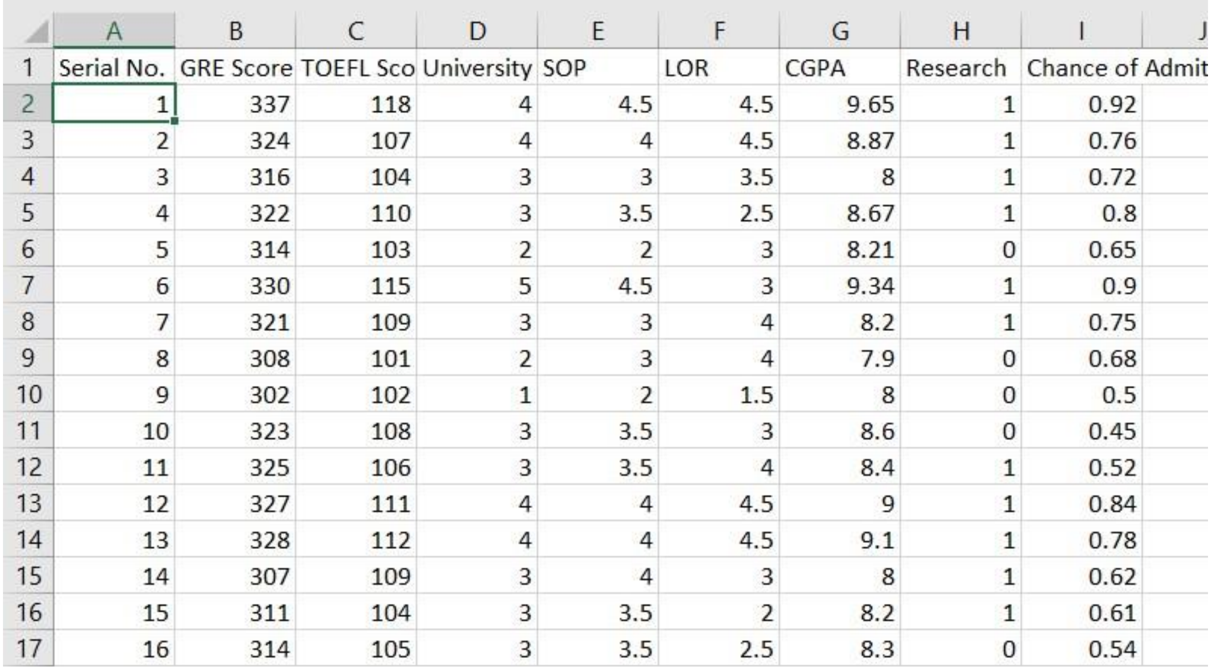


UNIVERSITY ADMIT ELIGIBILITY PREDICTOR

You Have Low/No Chance

The model has predicted that you donot have chance

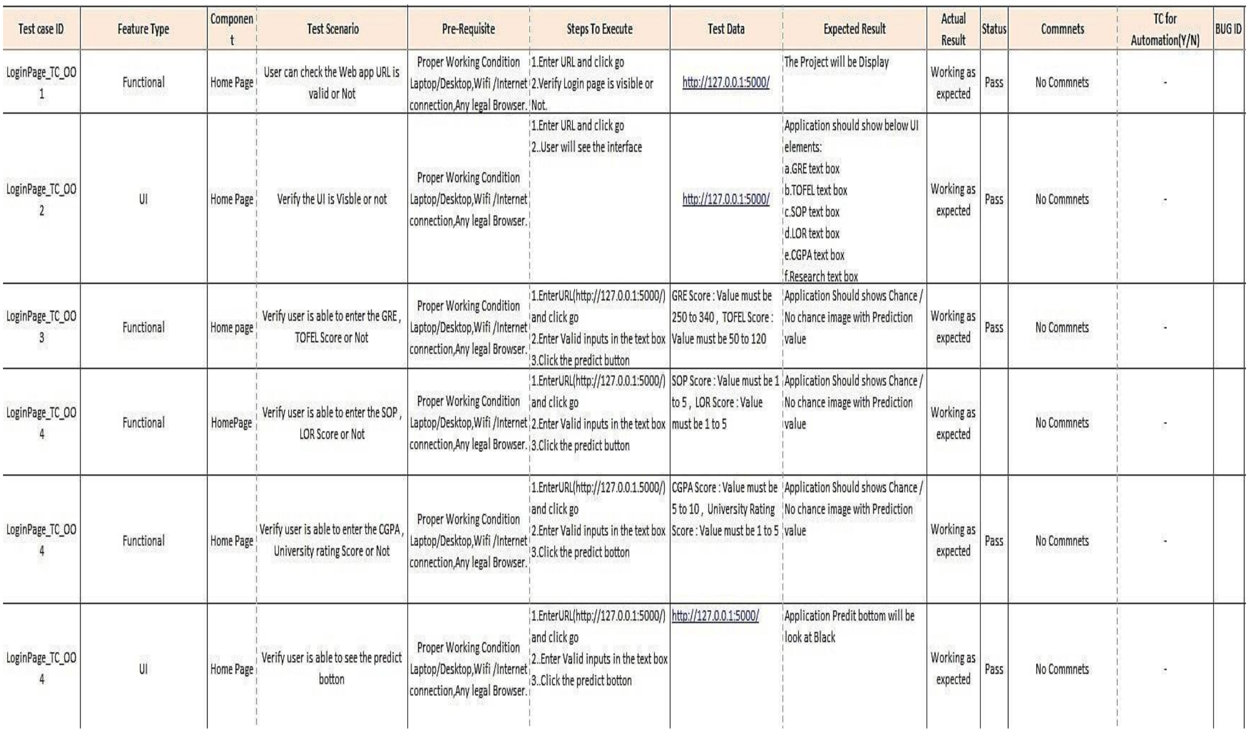
7.3 DATABASE SCHEMA



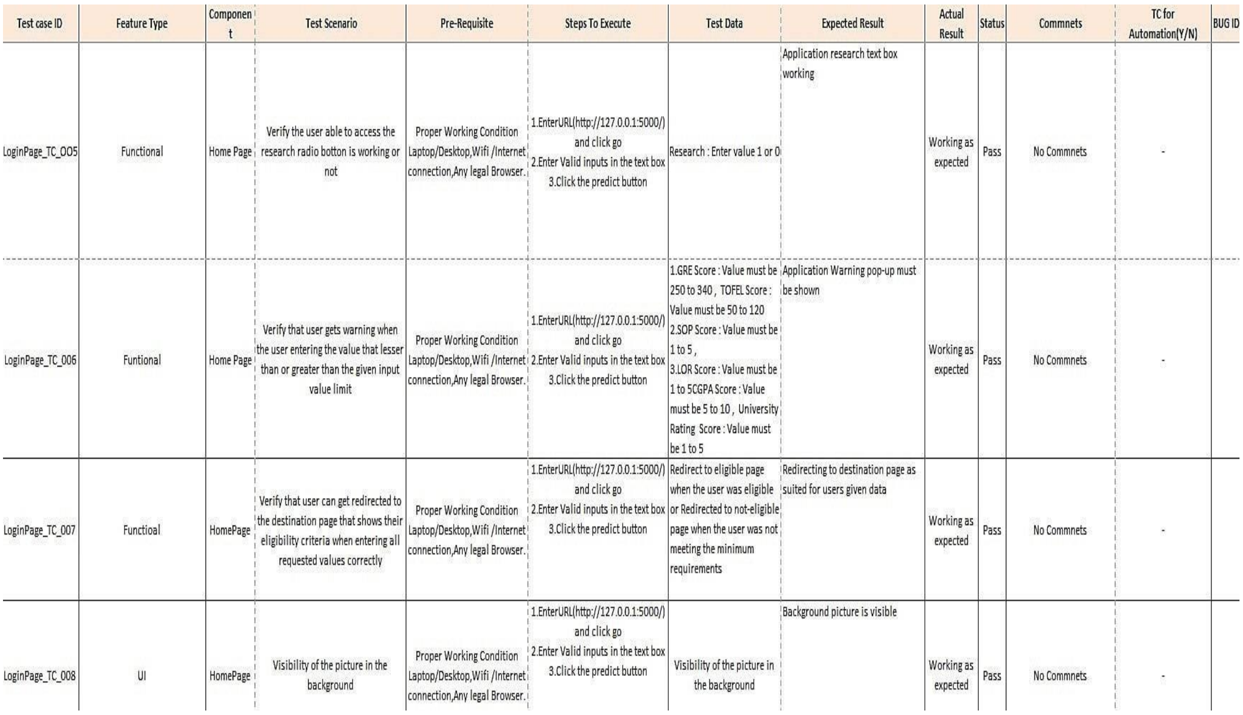
	A	B	C	D	E	F	G	H	I	J
1	Serial No.	GRE Score	TOEFL Sco	University	SOP	LOR	CGPA	Research	Chance of Admit	
2	1	337	118	4	4.5	4.5	9.65	1	0.92	
3	2	324	107	4	4	4.5	8.87	1	0.76	
4	3	316	104	3	3	3.5	8	1	0.72	
5	4	322	110	3	3.5	2.5	8.67	1	0.8	
6	5	314	103	2	2	3	8.21	0	0.65	
7	6	330	115	5	4.5	3	9.34	1	0.9	
8	7	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

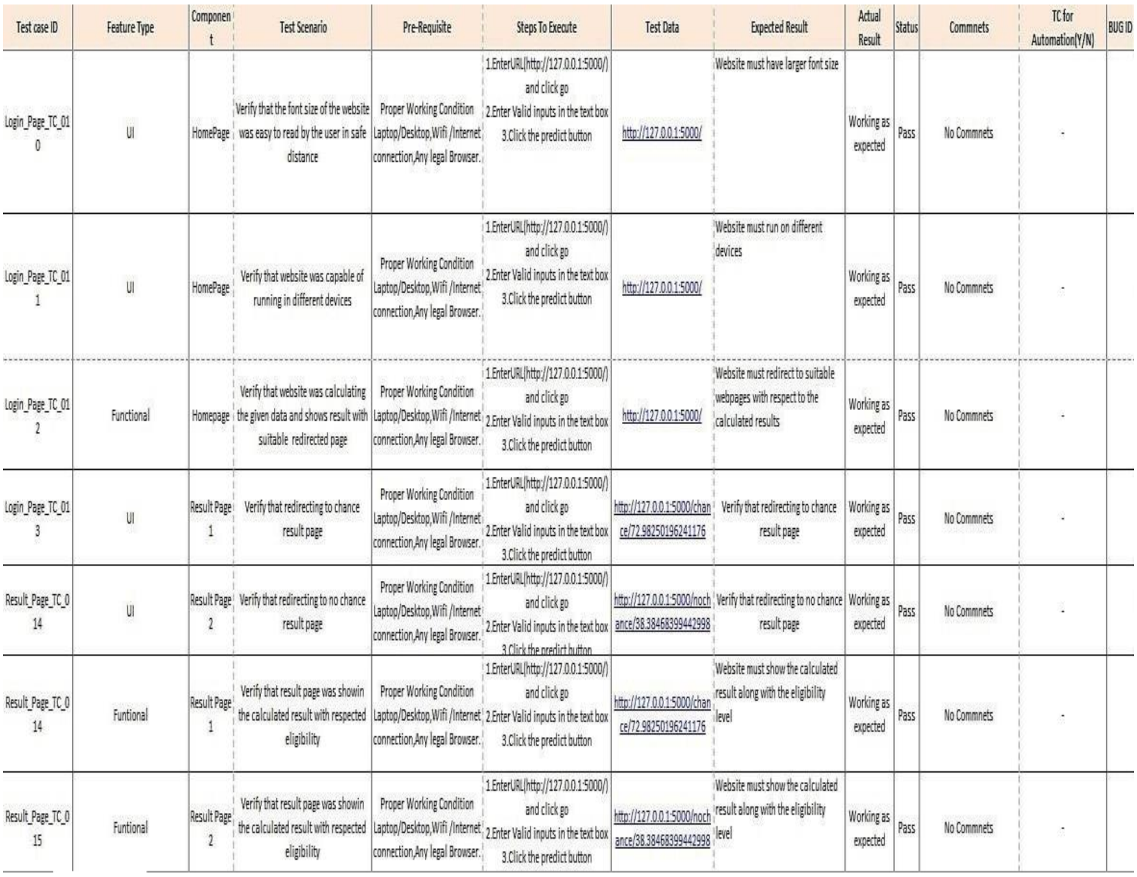
8.1 TEST CASES



Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation(Y/N)	BUG ID
LoginPage_TC_OO1	Functional	Home Page	User can check the Web app URL is valid or Not	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.Enter URL and click go 2.Verify Login page is visible or Not.	http://127.0.0.1:5000/	The Project will be Display	Working as expected	Pass	No Commnets	-	
LoginPage_TC_OO2	UI	Home Page	Verify the UI is Visble or not	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.Enter URL and click go 2..User will see the interface	http://127.0.0.1:5000/	Application should show below UI elements: a.GRE text box b.TOFEL text box c.SOP text box d.LOR text box e.CGPA text box f.Research text box	Working as expected	Pass	No Commnets	-	
LoginPage_TC_OO3	Functional	Home page	Verify user is able to enter the GRE , TOFEL Score or Not	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1:5000/) and click go 2.Enter Valid inputs in the text box 3.Click the predict button	GRE Score : Value must be 250 to 340 , TOFEL Score : Value must be 50 to 120	Application Should shows Chance / No chance image with Prediction value	Working as expected	Pass	No Commnets	-	
LoginPage_TC_OO4	Functional	HomePage	Verify user is able to enter the SOP , LOR Score or Not	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1:5000/) and click go 2.Enter Valid inputs in the text box 3.Click the predict button	SOP Score : Value must be 1 to 5 , LOR Score : Value must be 1 to 5	Application Should shows Chance / No chance image with Prediction value	Working as expected		No Commnets	-	
LoginPage_TC_OO4	Functional	Home Page	Verify user is able to enter the CGPA , University rating Score or Not	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1.5000/) and click go 2.Enter Valid inputs in the text box 3.Click the predict botton	CGPA Score : Value must be 5 to 10 , University Rating Score : Value must be 1 to 5	Application Should shows Chance / No chance image with Prediction value	Working as expected	Pass	No Commnets	-	
LoginPage_TC_OO4	UI	Home Page	Verify user is able to see the predict botton	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1:5000/) and click go 2..Enter Valid inputs in the text box 3..Click the predict botton	http://127.0.0.1:5000/	Application Predit bottom will be look at Black	Working as expected	Pass	No Commnets	-	

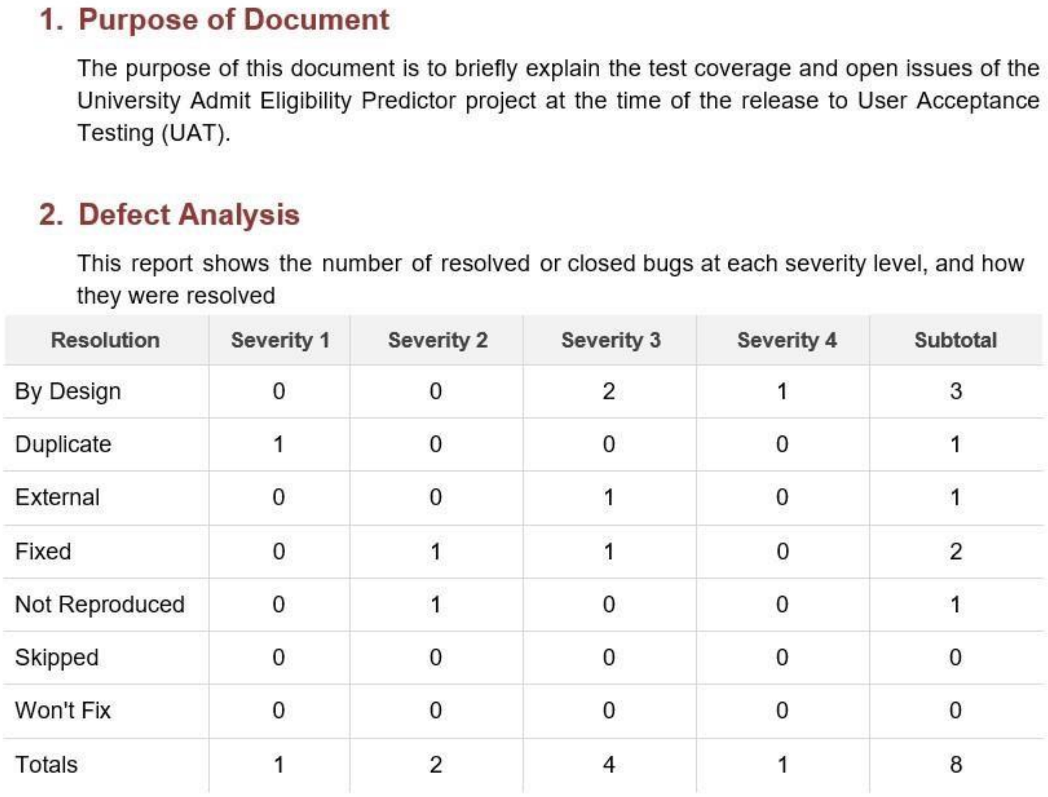


Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation(Y/N)	BUG ID
LoginPage_TC_OO5	Functional	Home Page	Verify the user able to access the research radio botton is working or not	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1:5000/) and click go 2.Enter Valid inputs in the text box 3.Click the predict button	Research : Enter value 1 or 0	Application research text box working	Working as expected	Pass	No Commnets	-	
LoginPage_TC_006	Funtional	Home Page	Verify that user gets warning when the user entering the value that lesser than or greater than the given input value limit	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1:5000/) and click go 2.Enter Valid inputs in the text box 3.Click the predict button	1.GRE Score : Value must be 250 to 340 , TOFEL Score : Value must be 50 to 120 2.SOP Score : Value must be 1 to 5 , 3.LOR Score : Value must be 1 to 5CGPA Score : Value must be 5 to 10 , University Rating Score : Value must be 1 to 5	Application Warning pop-up must be shown	Working as expected	Pass	No Commnets	-	
LoginPage_TC_007	Functioal	HomePage	Verify that user can get redirected to the destination page that shows their eligibility criteria when entering all requested values correctly	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1:5000/) and click go 2.Enter Valid inputs in the text box 3.Click the predict button	Redirect to eligible page when the user was eligible or Redirected to not-eligible page when the user was not meeting the minimum requirements	Redirecting to destination page as suited for users given data	Working as expected	Pass	No Commnets	-	
LoginPage_TC_008	UI	HomePage	Visibility of the picture in the background	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1:5000/) and click go 2.Enter Valid inputs in the text box 3.Click the predict button	Visibility of the picture in the background	Background picture is visible	Working as expected	Pass	No Commnets	-	



Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation(Y/N)	BUG ID
Login_Page_TC_010	UI	HomePage	Verify that the font size of the website was easy to read by the user in safe distance	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1:5000/) and click go 2.Enter Valid inputs in the text box 3.Click the predict button	http://127.0.0.1:5000/	Website must have larger font size	Working as expected	Pass	No Commnets	-	
Login_Page_TC_011	UI	HomePage	Verify that website was capable of running in different devices	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1:5000/) and click go 2.Enter Valid inputs in the text box 3.Click the predict button	http://127.0.0.1:5000/	Website must run on different devices	Working as expected	Pass	No Commnets	-	
Login_Page_TC_012	Functional	Homepage	Verify that website was calculating the given data and shows result with suitable redirected page	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1:5000/) and click go 2.Enter Valid inputs in the text box 3.Click the predict button	http://127.0.0.1:5000/	Website must redirect to suitable webpages with respect to the calculated results	Working as expected	Pass	No Commnets	-	
Login_Page_TC_013	UI	Result Page 1	Verify that redirecting to chance result page	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1:5000/) and click go 2.Enter Valid inputs in the text box 3.Click the predict button	http://127.0.0.1:5000/chance/72.98250196241176	Verify that redirecting to chance result page	Working as expected	Pass	No Commnets	-	
Result_Page_TC_014	UI	Result Page 2	Verify that redirecting to no chance result page	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1:5000/) and click go 2.Enter Valid inputs in the text box 3.Click the predict button	http://127.0.0.1:5000/nochance/38.38468399442998	Verify that redirecting to no chance result page	Working as expected	Pass	No Commnets	-	
Result_Page_TC_014	Funtional	Result Page 1	Verify that result page was showin the calculated result with respected eligibility	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1:5000/) and click go 2.Enter Valid inputs in the text box 3.Click the predict button	http://127.0.0.1:5000/chance/72.98250196241176	Website must show the calculated result along with the eligibility level	Working as expected	Pass	No Commnets	-	
Result_Page_TC_015	Funtional	Result Page 2	Verify that result page was showin the calculated result with respected eligibility	Proper Working Condition Laptop/Desktop,Wifi /Internet connection,Any legal Browser.	1.EnterURL(http://127.0.0.1:5000/) and click go 2.Enter Valid inputs in the text box 3.Click the predict button	http://127.0.0.1:5000/nochance/38.38468399442998	Website must show the calculated result along with the eligibility level	Working as expected	Pass	No Commnets	-	

8.2 USER ACCEPTANCE TESTING



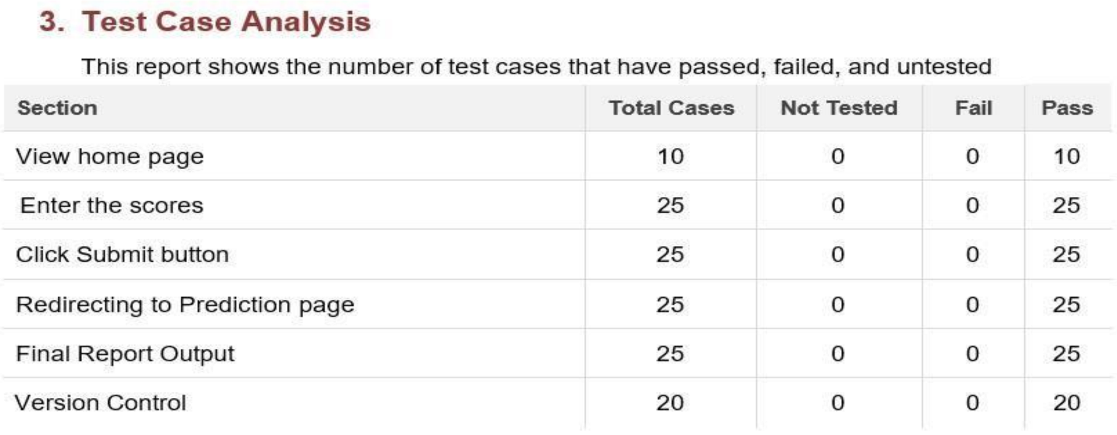
1. Purpose of Document

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	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	0	0	0	0
Totals	1	2	4	1	8



3. Test Case Analysis

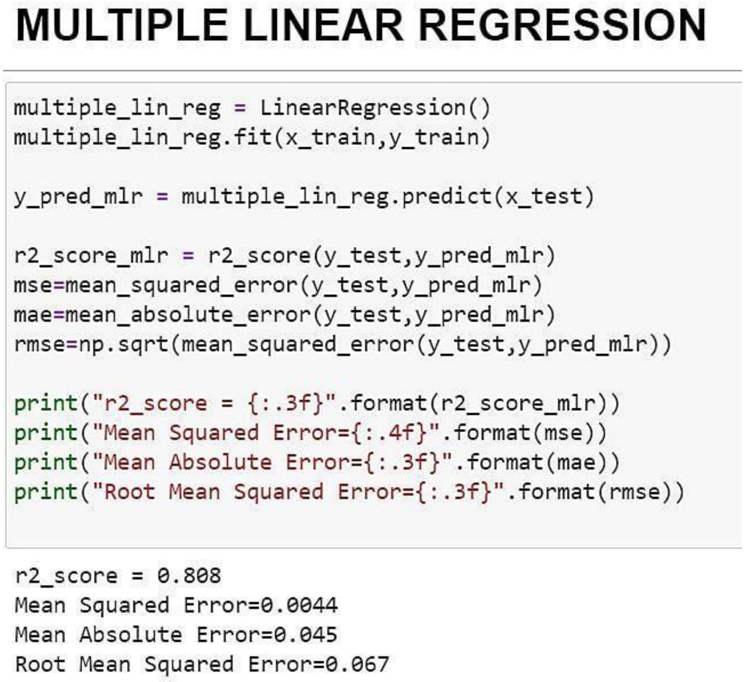
This report shows the number of test cases that have passed, failed, and untested

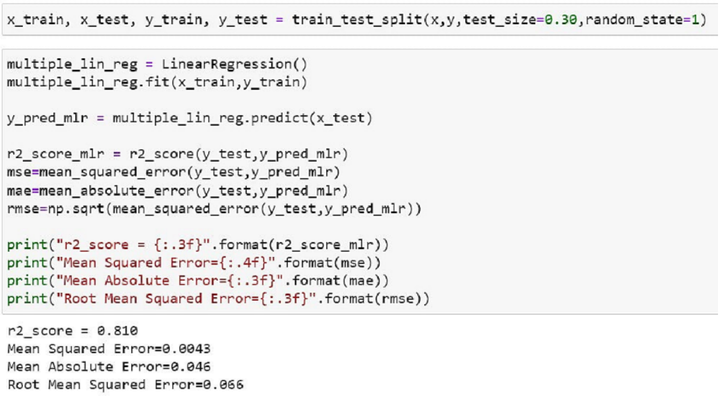
Section	Total Cases	Not Tested	Fail	Pass
View home page	10	0	0	10
Enter the scores	25	0	0	25
Click Submit button	25	0	0	25
Redirecting to Prediction page	25	0	0	25
Final Report Output	25	0	0	25
Version Control	20	0	0	20

9. RESULTS

9.1 PERFORMANCE METRICS

S.No.	Parameter	Values	Screenshot

1
.
	Metrics	Regression
		Model:
		R2_score=0.808
		MSE=0.0044
		MAE=0.045
		RMSE=0.067
			
			MULTIPLE LINEAR REGRESSION
			`multiple_lin_reg = LinearRegression()`
			`multiple_lin_reg.fit(x_train,y_train)`
			
			`y_pred_mlr = multiple_lin_reg.predict(x_test)`
			
			`r2_score_mlr = r2_score(y_test,y_pred_mlr)`
			`mse=mean_squared_error(y_test,y_pred_mlr)`
			`mae=mean_absolute_error(y_test,y_pred_mlr)`
			`rmse=np.sqrt(mean_squared_error(y_test,y_pred_mlr))`
			
			`print("r2_score = {:.3f}".format(r2_score_mlr))`
			`print("Mean Squared Error={:.4f}".format(mse))`
			`print("Mean Absolute Error={:.3f}".format(mae))`
			`print("Root Mean Squared Error={:.3f}".format(rmse))`
			
			`r2_score = 0.808`
			`Mean Squared Error=0.0044`
			`Mean Absolute Error=0.045`
			`Root Mean Squared Error=0.067`

2.	Tune the Model	Hyperparameter Tuning – I have changed the parameters it gives 1 percent more accuracy	

```
x_train, x_test, y_train, y_test = train_test_split(x,y,test_size=0.30,random_state=1)
```

```
multiple_lin_reg = LinearRegression()
multiple_lin_reg.fit(x_train,y_train)

y_pred_mlr = multiple_lin_reg.predict(x_test)

r2_score_mlr = r2_score(y_test,y_pred_mlr)
mse=mean_squared_error(y_test,y_pred_mlr)
mae=mean_absolute_error(y_test,y_pred_mlr)
rmse=np.sqrt(mean_squared_error(y_test,y_pred_mlr))

print("r2_score = {:.3f}".format(r2_score_mlr))
print("Mean Squared Error={:.4f}".format(mse))
print("Mean Absolute Error={:.3f}".format(mae))
print("Root Mean Squared Error={:.3f}".format(rmse))
```

```
r2_score = 0.810
Mean Squared Error=0.0043
Mean Absolute Error=0.046
Root Mean Squared Error=0.066
```

10. ADVANTAGES AND DISADVANTAGES

ADVANTAGES

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

DISADVANTAGES

1. Required active internet connection.
2. System will provide inaccurate results if data is entered incorrectly.
3. 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.

4. Admissions also depend on the individual university's Policy regarding the intake of foreign students and are 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 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 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 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 the model that gives the best performance.

12. FUTURE SCOPE

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

1. This can be implemented in less time for a proper admission process.
2. This can be accessed anytime anywhere since it is a web application provided only an internet connection.
3. The user had not need to travel a long distance for admission and his/her time is also saved as a result of this automated system.
4. The scope of this project is a web application that allows users to enter their academic data and get predictions of their chances of admission to the university tier of their choosing.
5. It also provides an analysis based on the data set used that shows how the differences affect the chances of admissions.

6. 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.

7. 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.

8. Other criteria like Co-curricular achievements, Leadership positions held, job experience, etc can also be included in metrics for the model.

13. APPENDIX

13.1 SOURCE CODE

MODEL SAVED IN IBM CLOUD:

```
import pandas as pd
from flask import Flask, request, jsonify, render_template, redirect,url_for
import requests

# NOTE: you must manually set API_KEY below using information retrieved from your IBM Cloud account. API_KEY="dBZwh_kI4ymMDFrMHVa3Qt4_hBk-ezkorDqJNV6t7Nl_" token_response = requests.post('https://iam.cloud.ibm.com/identity/token', data={"apikey": API_KEY, "grant_type": 'urn:ibm:params:oauth:grant-type:apikey'}) mltoken = token_response.json()["access_token"]

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

```
app = Flask(__name__,template_folder='Template')



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

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

    GRE_Score = int(request.form['GRE Score'])
    TOEFL_Score = int(request.form['TOEFL Score'])
    University_Rating = int(request.form['University Rating'])
    SOP = float(request.form['SOP'])
    LOR = float(request.form['LOR'])
    CGPA = float(request.form['CGPA'])     Research = int(request.form['Research'])
    final_features = [[GRE_Score, TOEFL_Score, University_Rating, SOP, LOR,
CGPA,Research]]

    payload_scoring={'input_data':[{'fields':[["GRE Score","TOEFL Score","University
Rating","SOP","LOR
","CGPA","Research"]],'values':final_features}]}     print("hello")
    response_scoring = requests.post('https://us-
south.ml.cloud.ibm.com/ml/v4/deployments/2872d436-41b9-47f3-bc57-
6b9f2bc28348/predictions?version=2022-11-10',                    json=payload_scoring,
headers={'Authorization':   'Bearer   '   +   mltoken})            print("scoring   response")
pred=response_scoring.json()
    print(pred)    output=pred['predictions'][0]['values'][0][0]


    if output > 0.5:
        return redirect(url_for('chance', percent=output*100))      else:
        return redirect(url_for('no_chance', percent=output*100))





@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])


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

SOURCE CODE FOR MODEL SAVED IN LOCAL SYSTEM:

```
import pandas as pd
from flask import Flask, request, jsonify, render_template, redirect,url_for
import pickle


app=Flask(__name__,template_folder='Template')
```

```
model = pickle.load(open('D:/IBM_UAEP/model.pkl', 'rb'))



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

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

    GRE_Score = int(request.form['GRE Score'])
    TOEFL_Score = int(request.form['TOEFL Score'])
    University_Rating = int(request.form['University Rating'])
    SOP = float(request.form['SOP'])
    LOR = float(request.form['LOR'])
    CGPA = float(request.form['CGPA'])
    Research = int(request.form['Research'])

    final_features = pd.DataFrame([[GRE_Score, TOEFL_Score, University_Rating, SOP, LOR, CGPA,Research]])     predict=model.predict(final_features)

    output=predict[0]     if output > 0.5:
        return redirect(url_for('chance', percent=output*100))       else:
        return redirect(url_for('no_chance', percent=output*100))
```

```
@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])


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

13.2 GITHUB & PROJECT DEMO LINK

GitHub Link: https://github.com/IBM-EPBL/IBM-Project-25378-1659961100

Project Demo Link: https://youtu.be/VLT5GeIuj9k