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COLLEGE OF ENGINEERING AND TECHNOLOGY
An Autonomous Institution
Affiliated to Anna University, Chennai. Approved by AICTE.
Accredited by NBA and NAAC with Grade A
Udumalai Road, Pollachi - 642 003. Tamilnadu.

UNIVERSITY ADMIT ELIGIBILITY PREDICTOR

A PROJECT REPORT

TEAM ID: PNT2022TMID08646

Submitted by

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in partial fulfillment for the award of the degree
of

BACHELOR OF ENGINEERING
IN
COMPUTER SCIENCE AND ENGINEERING
Dr. MAHALINGAM COLLEGE OF
ENGINEERING & TECHNOLOGY
(Autonomous)
POLLACHI - 642 003

NOV 2022

CONTENTS

1. INTRODUCTION

The world's business sector is escalating and is constantly seeking information and experiences that are commonly beneficial to individuals. Young specialists who need to stay in their current positions are always looking for advanced degrees to help them address their skills and information. As such, the number of her sophomores applying for graduation exams has increased over the past decade. One of her main concerns is getting into fantasy her university. You can see that undergraduates are actually choosing to get their education at prestigious universities. Furthermore, when it comes to international alumni, the United States is the main trend for most of them.The most prestigious universities offer a wide range of courses accessible in any order, exceptionally accredited teaching and education programs, an international second Research scholarships for degrees are available.

According to Gauges, more than 4,444 of her 10 million international sophomores are enrolled in her 4,200+ colleges and universities, both private and public. In general, the number of undergraduates concentrated in America comes from Asian countries such as India, Pakistan, Sri Lanka, Japan and China. Select the United Kingdom, Germany, Italy, Australia, Canada as well as the United States. These countries are witnessing a rapid increase in the number of individuals seeking more advanced investigations. The basic reason why sophomores go on to master's programs in foreign graduate schools is that the number of vacancies is low and the number of people in these positions in each country is huge. This has led many professional undergraduates to pursue postgraduate studies. You can see that there are quite a few bachelor's degrees and master's degrees in computer science at US universities. The focus of this study applies to these undergraduate degrees. Many schools in the US follow comparative requirements for undergraduate accreditation. Schools consider several variables, including placement in fitness assessments and school performance ratings. English rankings are determined by exposure in English proficiency tests such as TOEFL and IELTS.

The University's Admissions Advisory Board makes decisions regarding the acceptance or rejection of specific young researchers based on the general profile of the applicant's application. Records recorded with this company are marked with informative areas. Acknowledgment is a 400-row data set containing seven different autonomic factors. ie

- Graduate Record Examination 1 (GRE) score. The score consists of 340 foci.

- English as a Foreign Language (TOEFL) test score. It consists of 120 priority areas.

- Uni.Rating. Shows the position of colleges offering bachelor's degrees among various colleges. Your score will be out of 5.

- Statement of Purpose (SOP), a record written to reveal the life, motivations and inspirations of a selected degree/college applicant. The score consists of five focal points.

- The strength of a letter of recommendation (LOR) verifies the applicant's professional experience, falsifies validity, supports certainty, and guarantees your competence. The score consists of five focal points.

- Undergraduate GPA (CGPA) from 10.

- Research experience (either 0 or 1) that could support the application, such as distributing research papers at conferences or filling out as a right-hand exam for university faculty. One ward variable can be anticipated which is possibility of affirmation, that is as per the input given will be going from 0 to 1.

1.1 PROJECT OVERVIEW

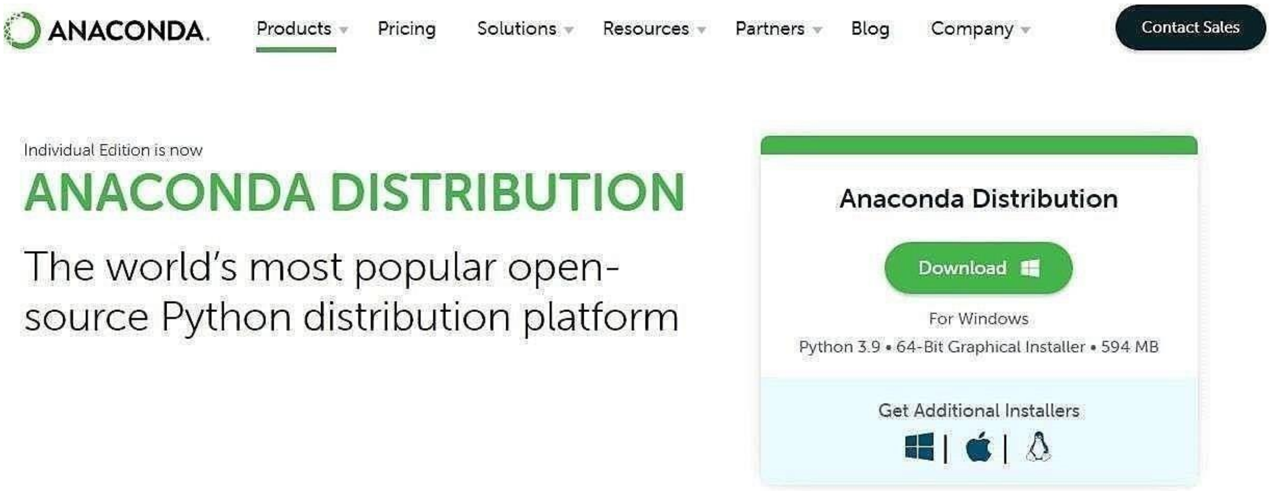
PRE-REQUISTIES

Anaconda Installation:

Anaconda is a distribution of the Python and R programming languages for scientific computing that aims to simplify package management and deployment. The distribution includes datascience packages suitable for Windows, Linux, and macOS. Developed and maintained byAnaconda. Founded in 2012 by Peter Wang and Travis Olyphant. As Anaconda, also known as Anaconda Distribution or Anaconda Individual Edition, the company's other products include hisAnaconda Team Edition and Anaconda Enterprise Edition, neither of which are free.

WAY TO INSTALL ANACONDA:

STEP 1: Download and Anaconda



Individual Edition is now

ANACONDA DISTRIBUTION

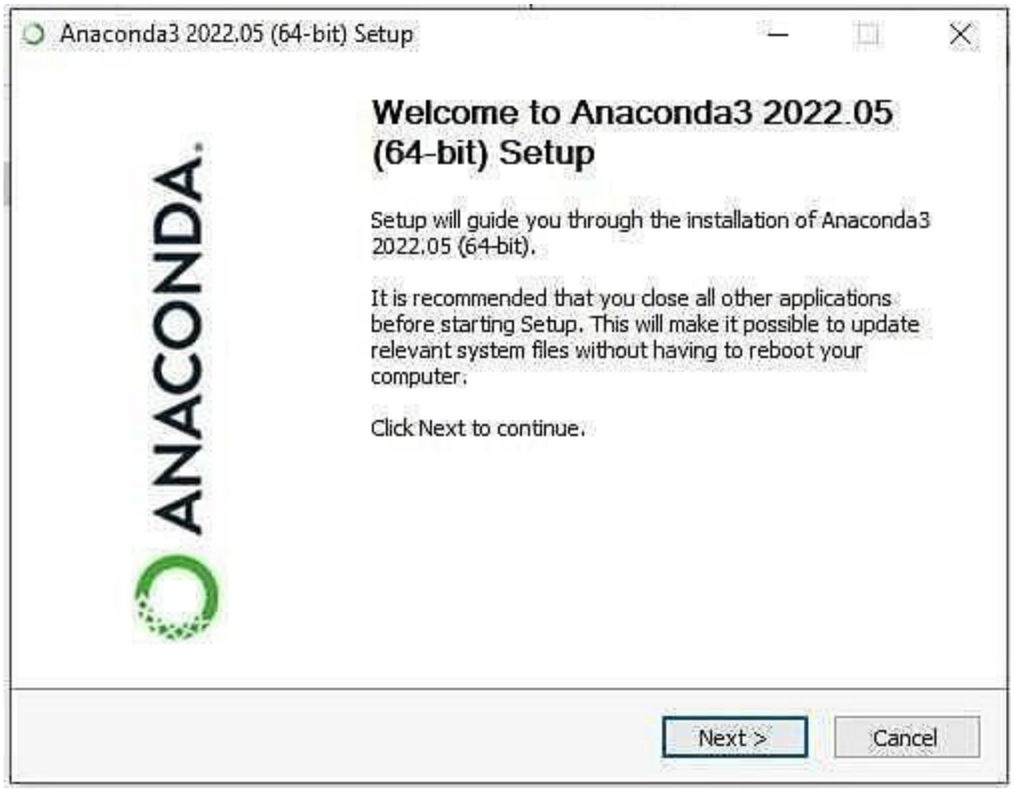
The world's most popular open-source Python distribution platform

Anaconda Distribution

For Windows

Python 3.9 • 64-Bit Graphical Installer • 594 MB

STEP 2: Install the Anaconda



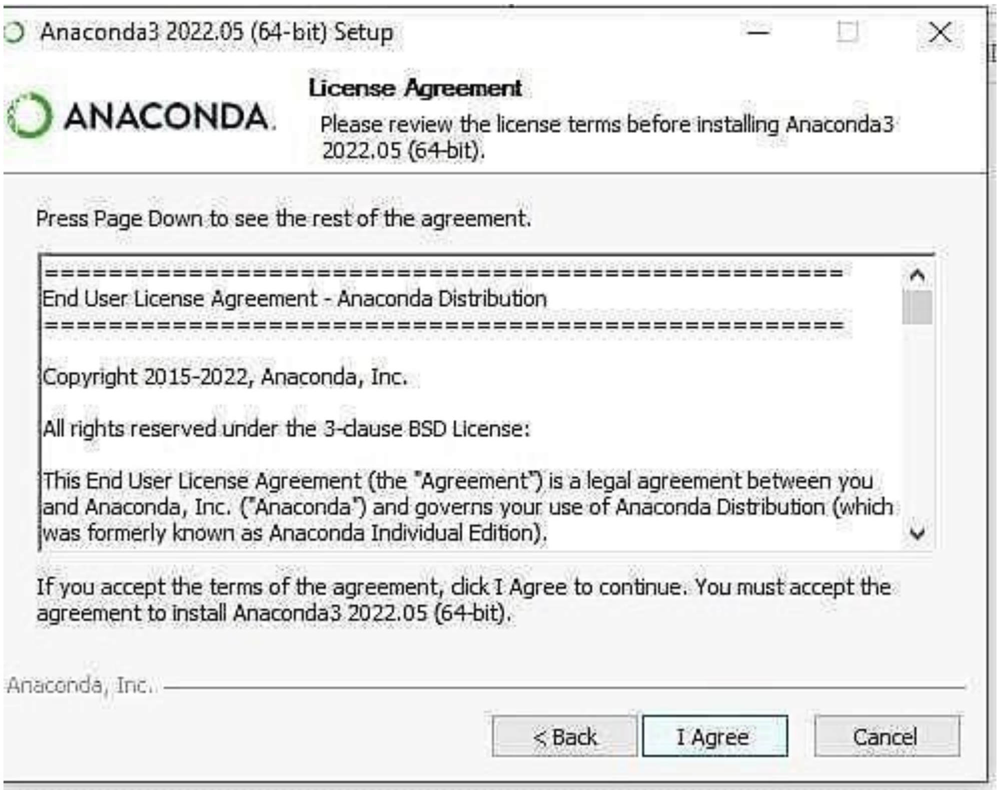
Welcome to Anaconda3 2022.05 (64-bit) Setup

Setup will guide you through the installation of Anaconda3 2022.05 (64-bit).

It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.

Click Next to continue.

STEP 3: Click I Agree



License Agreement

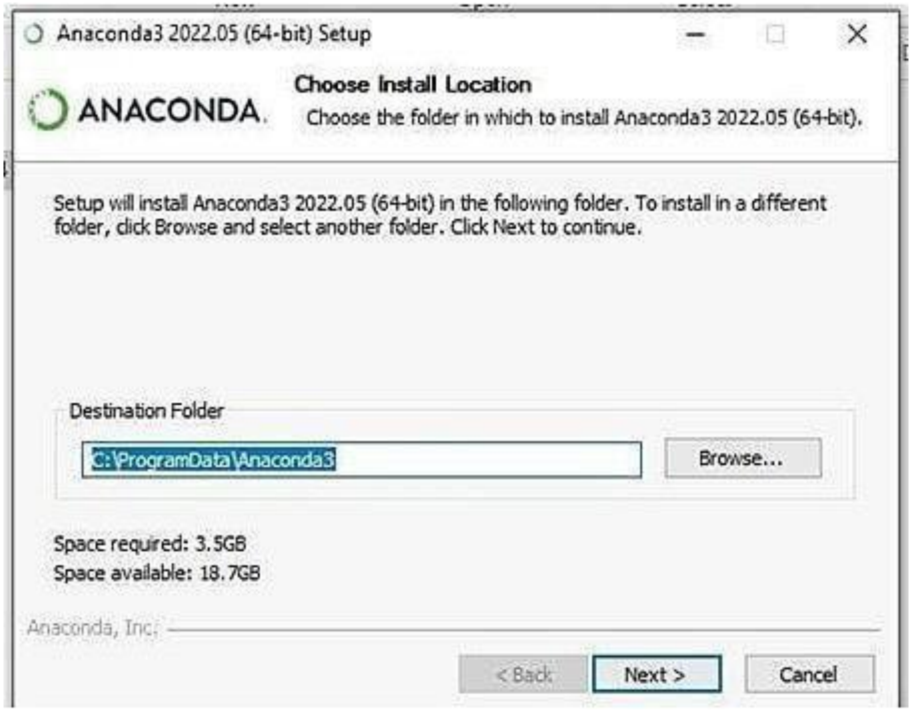
Please review the license terms before installing Anaconda3 2022.05 (64-bit).

Press Page Down to see the rest of the agreement.

```
==================================================
End User License Agreement - Anaconda Distribution
==================================================

Copyright 2015-2022, Anaconda, Inc.

All rights reserved under the 3-clause BSD License:

This End User License Agreement (the "Agreement") is a legal agreement between you
and Anaconda, Inc. ("Anaconda") and governs your use of Anaconda Distribution (which
was formerly known as Anaconda Individual Edition).
```

If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install Anaconda3 2022.05 (64-bit).

STEP 4: Choose the Installation Location



Anaconda3 2022.05 (64-bit) Setup

Choose Install Location

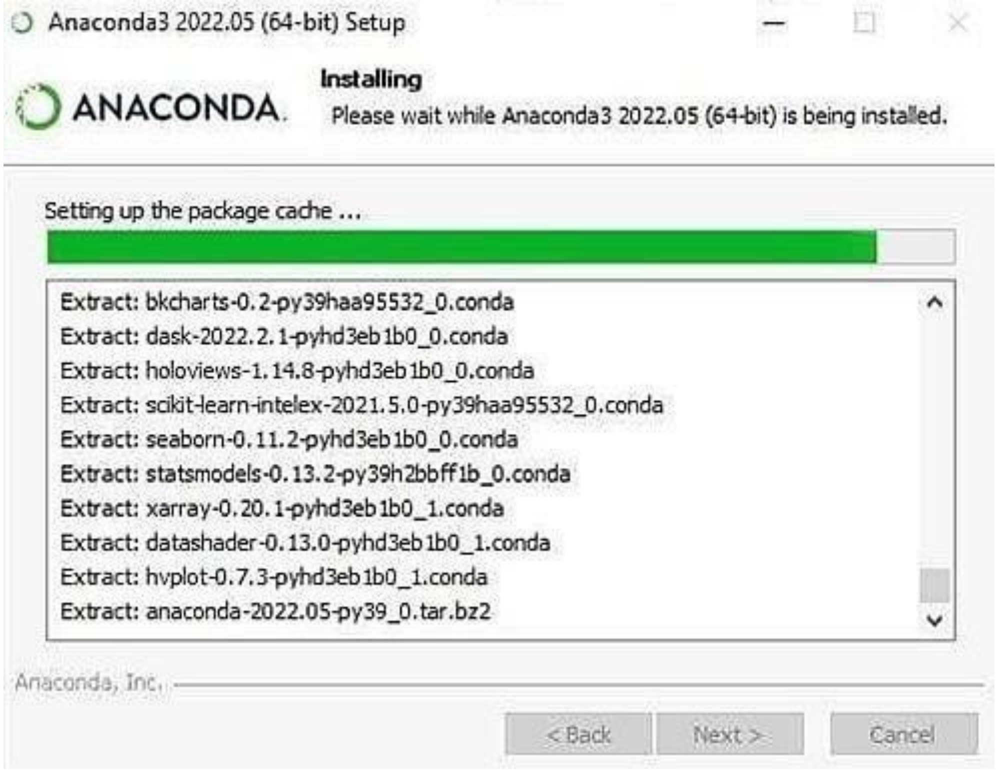
Choose the folder in which to install Anaconda3 2022.05 (64-bit).

Setup will install Anaconda3 2022.05 (64-bit) in the following folder. To install in a different folder, click Browse and select another folder. Click Next to continue.

Destination Folder: C:\ProgramData\Anaconda3

Space required: 3.5GB
Space available: 18.7GB

STEP 5: Installing the Requiring packages



Anaconda3 2022.05 (64-bit) Setup

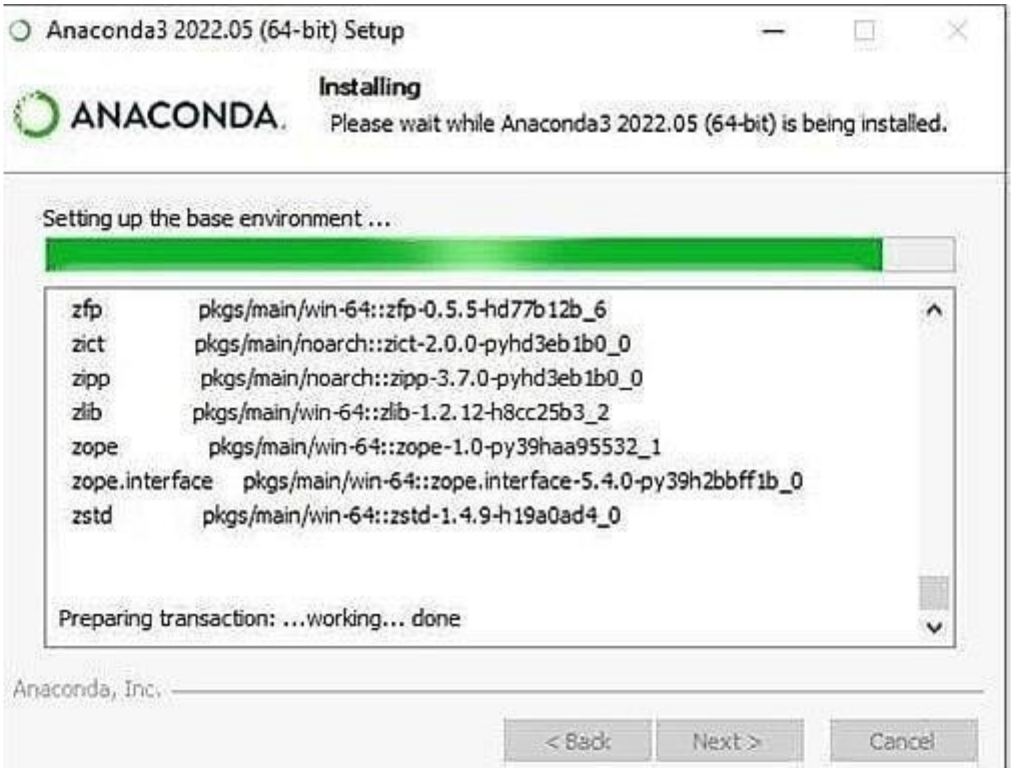
Installing

Please wait while Anaconda3 2022.05 (64-bit) is being installed.

Setting up the package cache ...

```
Extract: bkcharts-0.2-py39haa95532_0.conda
Extract: dask-2022.2.1-pyhd3eb1b0_0.conda
Extract: holoviews-1.14.8-pyhd3eb1b0_0.conda
Extract: scikit-learn-intelex-2021.5.0-py39haa95532_0.conda
Extract: seaborn-0.11.2-pyhd3eb1b0_0.conda
Extract: statsmodels-0.13.2-py39h2bbff1b_0.conda
Extract: xarray-0.20.1-pyhd3eb1b0_1.conda
Extract: datashader-0.13.0-pyhd3eb1b0_1.conda
Extract: hvplot-0.7.3-pyhd3eb1b0_1.conda
Extract: anaconda-2022.05-py39_0.tar.bz2
```

STEP 6: Setting up the base environment



Installing

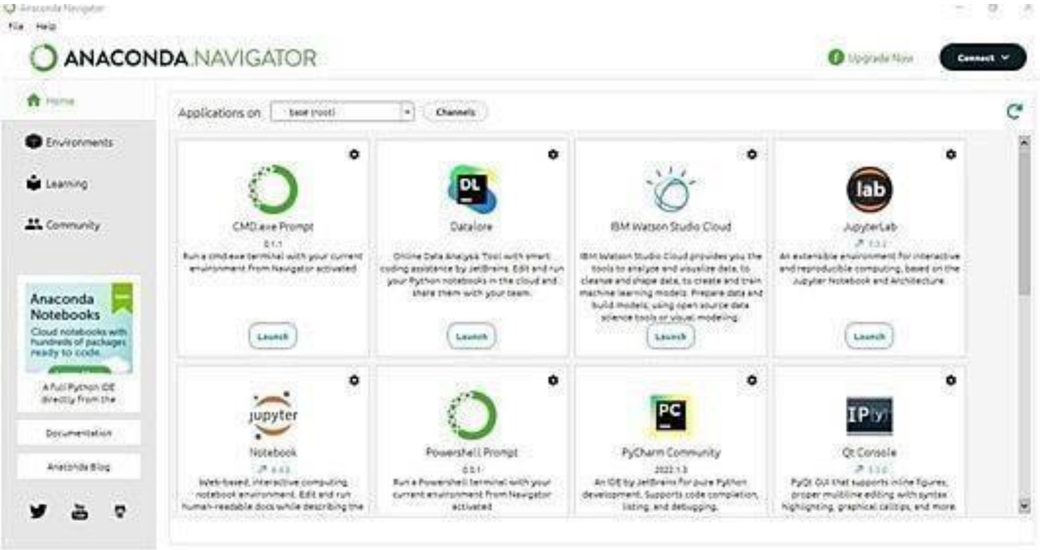
Please wait while Anaconda3 2022.05 (64-bit) is being installed.

Setting up the base environment ...

```
zfp            pkgs/main/win-64::zfp-0.5.5-hd77b12b_6
zict           pkgs/main/noarch::zict-2.0.0-pyhd3eb1b0_0
zipp           pkgs/main/noarch::zipp-3.7.0-pyhd3eb1b0_0
zlib           pkgs/main/win-64::zlib-1.2.12-h8cc25b3_2
zope           pkgs/main/win-64::zope-1.0-py39haa95532_1
zope.interface pkgs/main/win-64::zope.interface-5.4.0-py39h2bbff1b_0
zstd           pkgs/main/win-64::zstd-1.4.9-h19a0ad4_0


Preparing transaction: ...working... done
```

Anaconda, Inc.

STEP 7: Successfully Installed and check the Anaconda Navigator working or not



CMD.exe Prompt
0.1.1
Run a cmd.exe terminal with your current environment from Navigator activated.

Datalore
Online Data Analysis Tool with smart coding assistance by JetBrains. Edit and run your Python notebooks in the cloud and share them with your team.

IBM Watson Studio Cloud
IBM Watson Studio Cloud provides you the tools to analyze and visualize data, to cleanse and shape data, to create and train machine learning models. Prepare data and build models, using open source data science tools or visual modeling.

JupyterLab
3.3.2
An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture.

Notebook
6.4.8
Web-based, interactive computing notebook environment. Edit and run human-readable docs while describing the

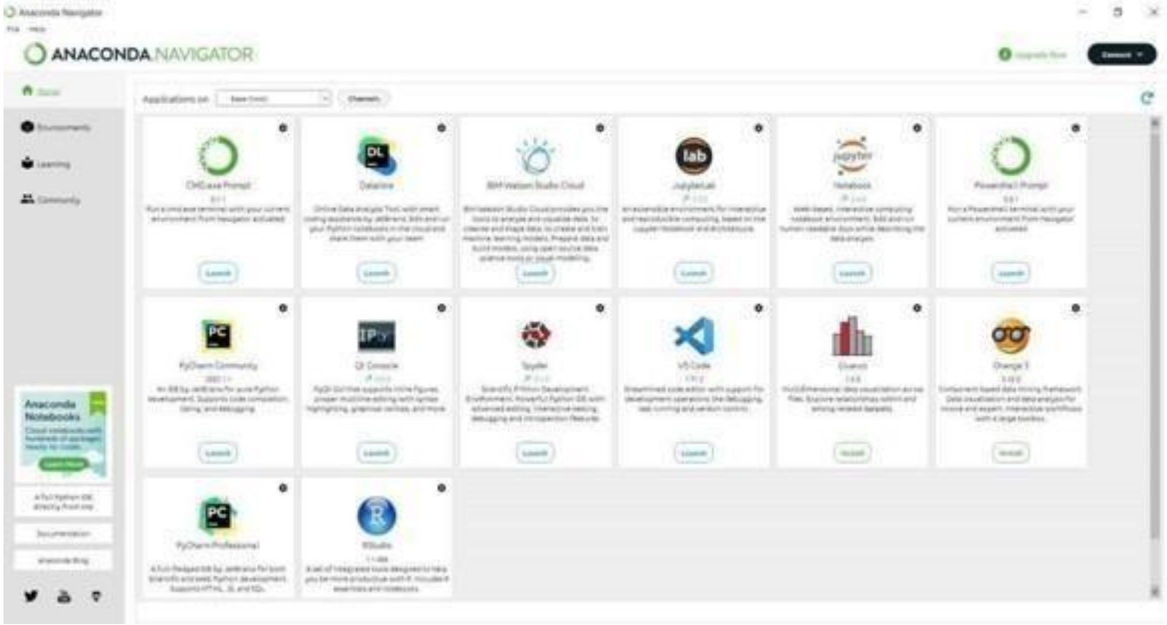
Powershell Prompt
0.0.1
Run a Powershell terminal with your current environment from Navigator activated

PyCharm Community
2022.1.3
An IDE by JetBrains for pure Python development. Supports code completion, listing, and debugging.

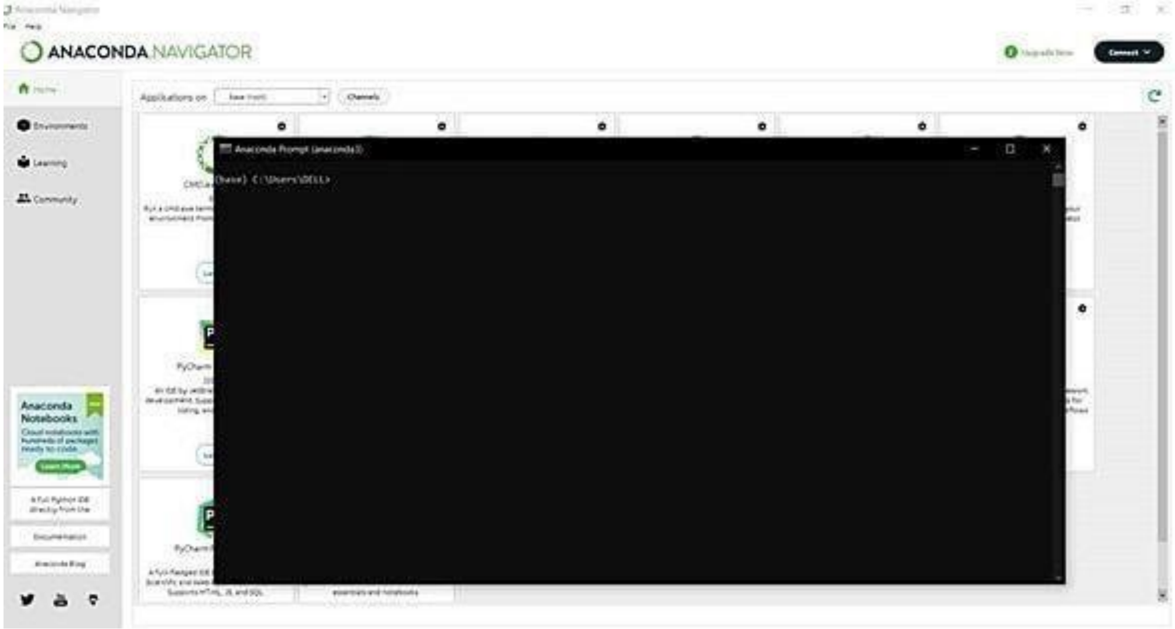
Qt Console
5.3.0
PyQt GUI that supports inline figures, proper multiline editing with syntax highlighting, graphical calltips, and more.

Python packages installation:

Step 1: Open the anaconda navigator in the start menu



Step 2: Open the CMD.exe prompt



```
(base) C:\Users\DELL>
```

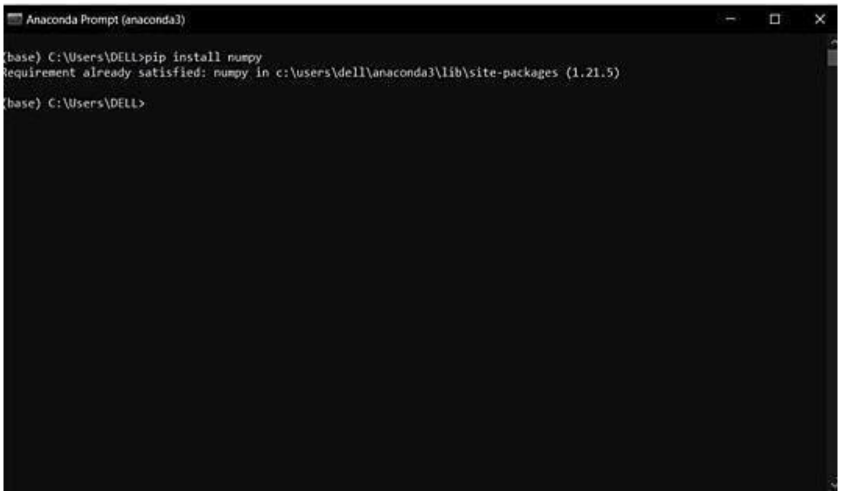
Step 3: Install the NUMPY package

To enter the numpy package enter the command in the CMD.exe

Command: **Pip install numpy**

Numpy:

This package is used to perform numerical computations. This package comes pre-installed with Anaconda. NumPy is used for manipulating arrays. NumPy stands for Numerical Python.



```
(base) C:\Users\DELL>pip install numpy
Requirement already satisfied: numpy in c:\users\dell\anaconda3\lib\site-packages (1.21.5)

(base) C:\Users\DELL>
```

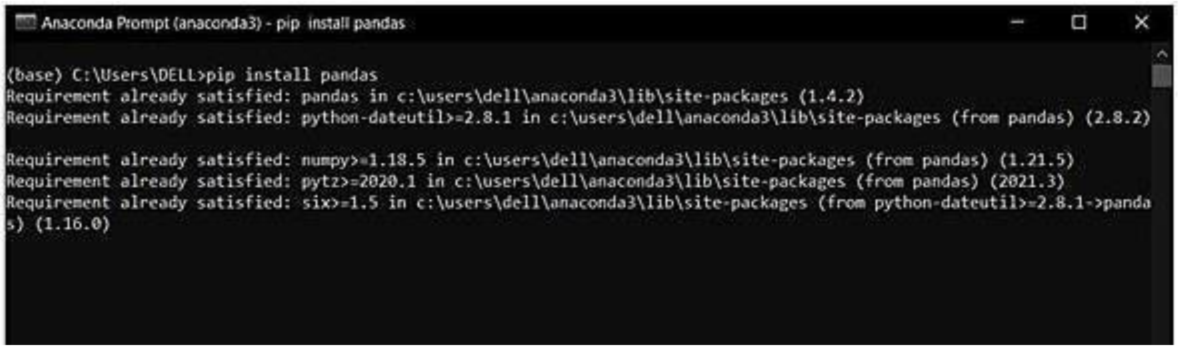
Step 4: Install the pandas package.

To enter the pandas package enter the command in the CMD.exe

Command: **Pip install pandas**

Pandas:

Pandas is one of the most widely used Python libraries for data science. It provides powerful and easy-to-use structure and data analysis tools. This package comes pre-installed with Anaconda. An open source library built on top of the NumPy library. A Python package that provides various data structures and operations for working with numerical data and time series. Mainly, it's common for data to be imported and analyzed much easier. Pandas is fast, providing users with high performance and productivity.



```
(base) C:\Users\DELL>pip install pandas
Requirement already satisfied: pandas in c:\users\dell\anaconda3\lib\site-packages (1.4.2)
Requirement already satisfied: python-dateutil>=2.8.1 in c:\users\dell\anaconda3\lib\site-packages (from pandas) (2.8.2)

Requirement already satisfied: numpy>=1.18.5 in c:\users\dell\anaconda3\lib\site-packages (from pandas) (1.21.5)
Requirement already satisfied: pytz>=2020.1 in c:\users\dell\anaconda3\lib\site-packages (from pandas) (2021.3)
Requirement already satisfied: six>=1.5 in c:\users\dell\anaconda3\lib\site-packages (from python-dateutil>=2.8.1->panda
s) (1.16.0)
```

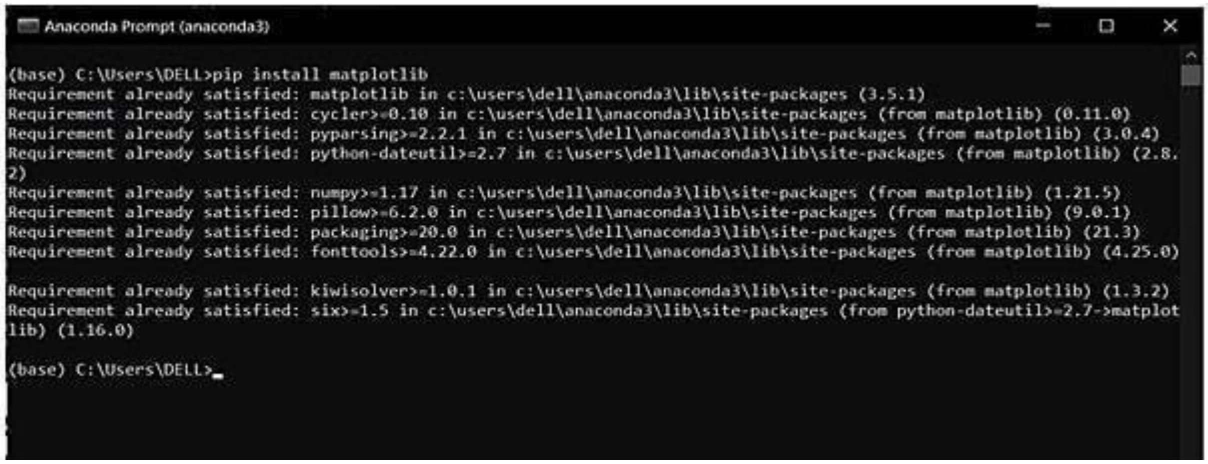
Step 5: Install the Matplotlib package.

To enter the Matplotlib package enter the command in the CMD.exe

Command: **Pip install Matplotlib**

Matplotlib:

Matplotlib is a comprehensive library for creating static, animated and interactive visualizations in Python. This package comes pre-installed with Anaconda. Matplotlib is a nice visualization library in Python for 2D plotting of arrays. Matplotlib is a cross-platform data visualization library based on NumPy arrays and designed to work with the wider SciPy stack. Introduced by John Hunter in 2002.



```
(base) C:\Users\DELL>pip install matplotlib
Requirement already satisfied: matplotlib in c:\users\dell\anaconda3\lib\site-packages (3.5.1)
Requirement already satisfied: cycler>=0.10 in c:\users\dell\anaconda3\lib\site-packages (from matplotlib) (0.11.0)
Requirement already satisfied: pyparsing>=2.2.1 in c:\users\dell\anaconda3\lib\site-packages (from matplotlib) (3.0.4)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\dell\anaconda3\lib\site-packages (from matplotlib) (2.8.
2)
Requirement already satisfied: numpy>=1.17 in c:\users\dell\anaconda3\lib\site-packages (from matplotlib) (1.21.5)
Requirement already satisfied: pillow>=6.2.0 in c:\users\dell\anaconda3\lib\site-packages (from matplotlib) (9.0.1)
Requirement already satisfied: packaging>=20.0 in c:\users\dell\anaconda3\lib\site-packages (from matplotlib) (21.3)
Requirement already satisfied: fonttools>=4.22.0 in c:\users\dell\anaconda3\lib\site-packages (from matplotlib) (4.25.0)

Requirement already satisfied: kiwisolver>=1.0.1 in c:\users\dell\anaconda3\lib\site-packages (from matplotlib) (1.3.2)
Requirement already satisfied: six>=1.5 in c:\users\dell\anaconda3\lib\site-packages (from python-dateutil>=2.7->matplot
lib) (1.16.0)

(base) C:\Users\DELL>_
```

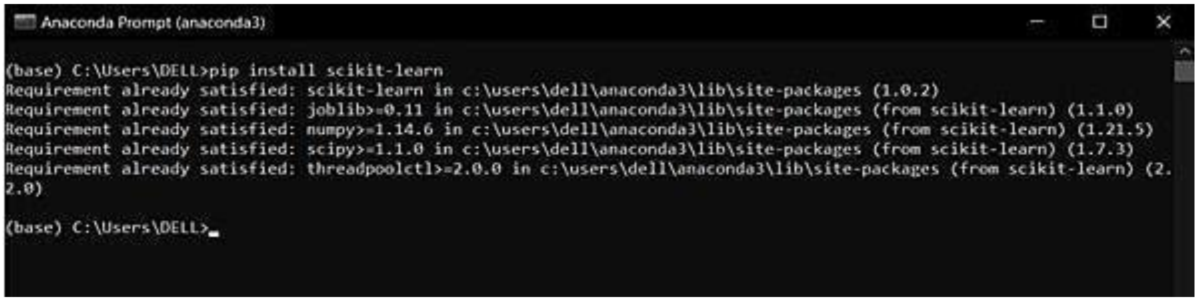
Step 6: Install the Scikit-learn package.

To enter the Scikit- learn package enter the command in the CMD.exe

Command: **Pip install Scikit-learn**

Scikit-learn:

This is a machine learning library for the Python programming language. This package comes pre-installed with Anaconda. Scikit Learn in Python is primarily used to focus on modeling in Python. It was only focused on modeling, not loading data.



```
(base) C:\Users\DELL>pip install scikit-learn
Requirement already satisfied: scikit-learn in c:\users\dell\anaconda3\lib\site-packages (1.0.2)
Requirement already satisfied: joblib>=0.11 in c:\users\dell\anaconda3\lib\site-packages (from scikit-learn) (1.1.0)
Requirement already satisfied: numpy>=1.14.6 in c:\users\dell\anaconda3\lib\site-packages (from scikit-learn) (1.21.5)
Requirement already satisfied: scipy>=1.1.0 in c:\users\dell\anaconda3\lib\site-packages (from scikit-learn) (1.7.3)
Requirement already satisfied: threadpoolctl>=2.0.0 in c:\users\dell\anaconda3\lib\site-packages (from scikit-learn) (2.
2.0)

(base) C:\Users\DELL>
```

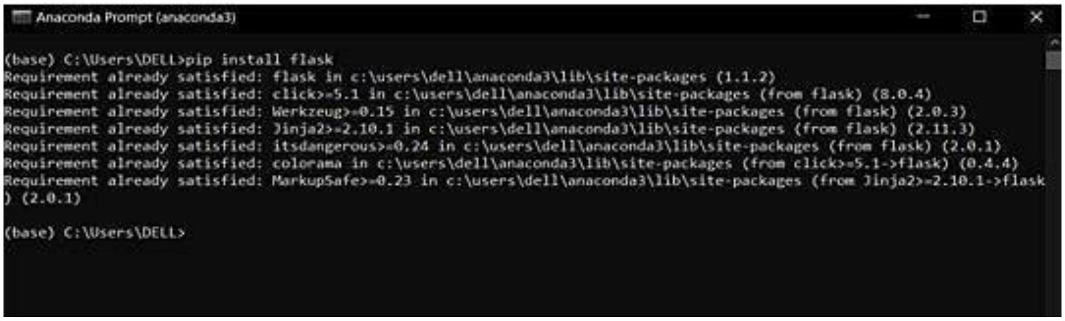
Step 7: Install the Flask package.

To enter the Flask package enter the command in the CMD.exe

Command: **Pip install Flask**

Flask:

Flask is a lightweight WSGI web application framework Flask is a web application framework written in Python. It is developed by Armin Ronacher, who leads an internationalgroup of Python enthusiasts called Pocco. Flask is based on the WSGI toolkit tools and the Jinja2 template engine. Both are Pocco projects.



```
(base) C:\Users\DELL>pip install flask
Requirement already satisfied: flask in c:\users\dell\anaconda3\lib\site-packages (1.1.2)
Requirement already satisfied: click>=5.1 in c:\users\dell\anaconda3\lib\site-packages (from flask) (8.0.4)
Requirement already satisfied: Werkzeug>=0.15 in c:\users\dell\anaconda3\lib\site-packages (from flask) (2.0.3)
Requirement already satisfied: Jinja2>=2.10.1 in c:\users\dell\anaconda3\lib\site-packages (from flask) (2.11.3)
Requirement already satisfied: itsdangerous>=0.24 in c:\users\dell\anaconda3\lib\site-packages (from flask) (2.0.1)
Requirement already satisfied: colorama in c:\users\dell\anaconda3\lib\site-packages (from click>=5.1->flask) (0.4.4)
Requirement already satisfied: MarkupSafe>=0.23 in c:\users\dell\anaconda3\lib\site-packages (from Jinja2>=2.10.1->flask
) (2.0.1)

(base) C:\Users\DELL>
```

PROJECT FLOW

You will go through all the steps mentioned below to complete the project.

- User interacts with the UI (User Interface) to enter Data
- The entered data is analyzed by the model which is integrated
- Once model analyses the input the prediction is showcased on the UI

To accomplish this, we have to complete all the activities and tasks listed below

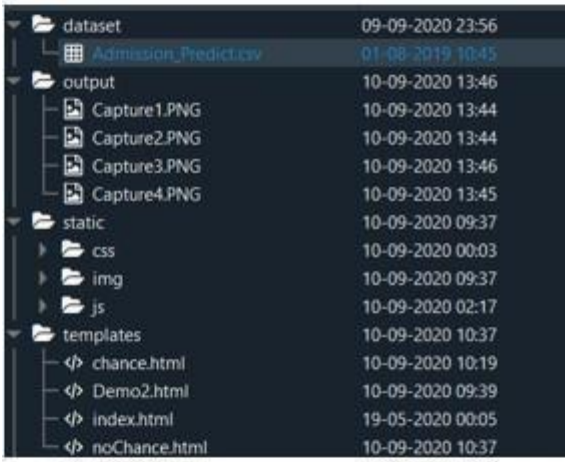
- Data Collection.
    - Collect the dataset or Create the dataset
- Data Preprocessing.
    - Import the Libraries.
    - Importing the dataset.
    - Checking for Null Values.
    - Data Visualization.
    - Taking care of Missing Data.
    - Label encoding.
    - One Hot Encoding.
    - Feature Scaling.
    - Splitting Data into Train and Test.
- Model Building
    - Training and testing the model
    - Evaluation of Model
- Application Building
    - Create an HTML file
    - Build a Python Code

PROJECT OBJECTIVES

- To understand regression and classification problems.
- To grab insights from data through visualization.
- Applying different Machine Learning algorithms to determine the probability of acceptance in a particular university.
- Evaluation metrics build a web application using the Flask framework

PROJECT STRUCTURE

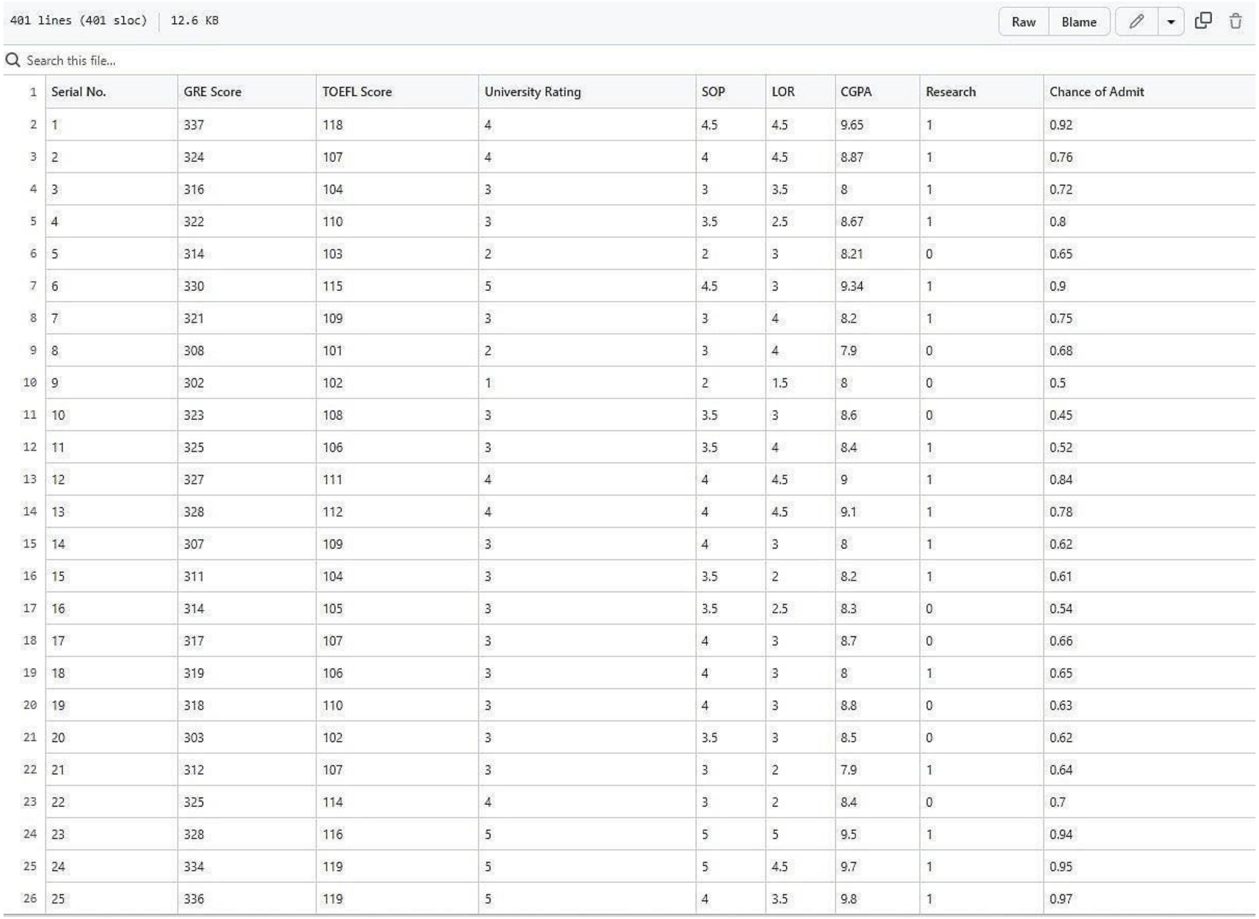
Create a Project folder that contains files as shown below



```
dataset                 09-09-2020 23:56
  Admission_Predict.csv 01-08-2019 10:45
output                  10-09-2020 13:46
  Capture1.PNG          10-09-2020 13:44
  Capture2.PNG          10-09-2020 13:44
  Capture3.PNG          10-09-2020 13:46
  Capture4.PNG          10-09-2020 13:45
static                  10-09-2020 09:37
  css                   10-09-2020 00:03
  img                   10-09-2020 09:37
  js                    10-09-2020 02:17
templates               10-09-2020 10:37
  chance.html           10-09-2020 10:19
  Demo2.html            10-09-2020 09:39
  index.html            19-05-2020 00:05
  noChance.html         10-09-2020 10:37
```

DATA COLLECTION

The path to common information varies by project type. ML projects use real-time information. Information indexes can be collected from a variety of sources such as documents, data sets, sensors, and other sources, using free information collection from the Internet. Kaggle and the UCI Machinelearning Repository are the most commonly used repositories for sorting information for machine learning models. Kaggle is probably the most visited website used for information gathering. Collect the dataset or Create the dataset.



Serial No.	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research	Chance of Admit
1	337	118	4	4.5	4.5	9.65	1	0.92
2	324	107	4	4	4.5	8.87	1	0.76
3	316	104	3	3	3.5	8	1	0.72
4	322	110	3	3.5	2.5	8.67	1	0.8
5	314	103	2	2	3	8.21	0	0.65
6	330	115	5	4.5	3	9.34	1	0.9
7	321	109	3	3	4	8.2	1	0.75
8	308	101	2	3	4	7.9	0	0.68
9	302	102	1	2	1.5	8	0	0.5
10	323	108	3	3.5	3	8.6	0	0.45
11	325	106	3	3.5	4	8.4	1	0.52
12	327	111	4	4	4.5	9	1	0.84
13	328	112	4	4	4.5	9.1	1	0.78
14	307	109	3	4	3	8	1	0.62
15	311	104	3	3.5	2	8.2	1	0.61
16	314	105	3	3.5	2.5	8.3	0	0.54
17	317	107	3	4	3	8.7	0	0.66
18	319	106	3	4	3	8	1	0.65
19	318	110	3	4	3	8.8	0	0.63
20	303	102	3	3.5	3	8.5	0	0.62
21	312	107	3	3	2	7.9	1	0.64
22	325	114	4	3	2	8.4	0	0.7
23	328	116	5	5	5	9.5	1	0.94
24	334	119	5	5	4.5	9.7	1	0.95
25	336	119	5	4	3.5	9.8	1	0.97

DATA PRE-PROCESSING

Importing the Libraries:

It is important to import all the necessary libraries such as pandas, numpy, matplotlib.

- **Numpy-**

It is an open-source numerical Python library. It contains a multi-dimensional array and matrix data structures. It can be used to perform mathematical operations on arrays such as trigonometric, statistical, and algebraic routines.

- **Pandas-**

It is a fast, powerful, flexible and easy to use open-source data analysis and manipulation tool, built on top of the Python programming language.

- **Seaborn-**

Seaborn is a Python data visualization library based on matplotlib. It provides a high-level interface for drawing attractive and informative statistical graphics.

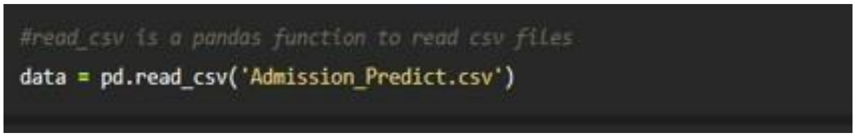
- **Matplotlib-**

Visualisation with python. It is a comprehensive library for creating static, animated, and interactive visualizations in Python

Reading the Datasets:

You might have your data in .csv files, .excel files

Let’s load a .csv data file into pandas usingread_csv() function. We will need to locate the directory of the CSV file at first



```
#read_csv is a pandas function to read csv files
data = pd.read_csv('Admission_Predict.csv')
```

If your dataset is in some other location ,Then see below command
Data= pd.read_csv(r”File_location/filename.csv”)

Note: r stands for "raw" and will cause backslashes in the string to be interpreted as actual backslashes rather than special characters.

Our Dataset Admission_Predict contains following Columns
1.Serial No.

2.GRE Score

3.TOEFL Score

4.University Rating

5.SOP

6.LOR

7.CGPA

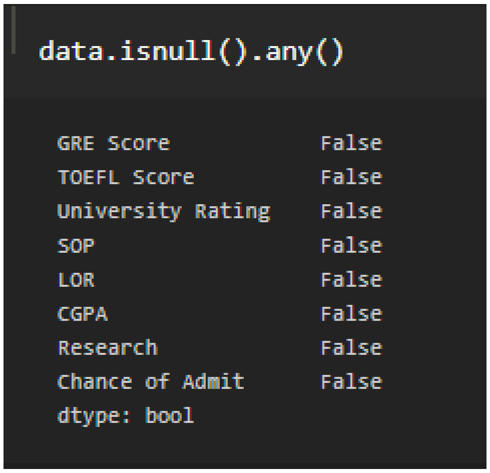
8.Chance of Admit

Handling Missing Values:

After loading it is important to check the complete information of data as it can indicate many of the hidden information such as null values in a column or a row
Check for the null values. if it is present then the following steps can be performed

- Imputing data using the Imputation method in sklearn.
- Filling NaNvalues with mean, median, and mode using fillna() method.

You can check the null values with the function isnull().any()



```
data.isnull().any()
```

```
GRE Score            False
TOEFL Score          False
University Rating    False
SOP                  False
LOR                  False
CGPA                 False
Research             False
Chance of Admit      False
dtype: bool
```

- If the dataset contains null values then the above functions return as true. But if you look at the dataset you can observe that the dataset does not have any null values.

- You can also check the number of null values present in the columns by the using isnull().sum() function

As we don't have categorical data then we can skip the steps of label encoding and one-hot encoding

Data Visualization:

Data visualization is where a given dataset is presented in a graphical format. It helps the detection of patterns, trends and correlations that might go undetected in text-based data. Understanding your data and the relationship present within it is just as important as anyalgorithm used to train your machine learning model. Machine learning models will perform poorly on data that wasn’t visualized and understood properly.

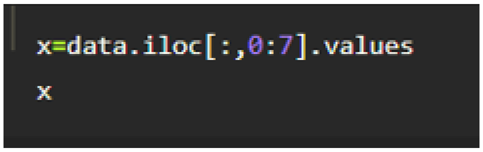
To visualize the dataset we need libraries called Matplotlib and Seaborn. The Matplotlib library is a Python 2D plotting library that allows you to generate plots, scatter plots, histograms, bar charts etc.

Splitting Dependent And Independent Columns:

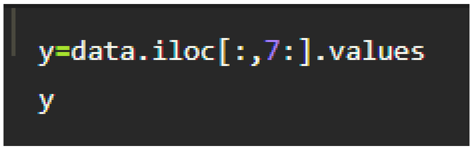
We need to split our dataset into the matrix of independent variables and the vector or dependent variable. Mathematically, Vector is defined as a matrix that has just one column.

- To read the columns, we will useiloc of pandas (used to fix the indexes for selection) which takes two parameters — [row selection, column selection].

Let’s split our dataset into independent and dependent variables.



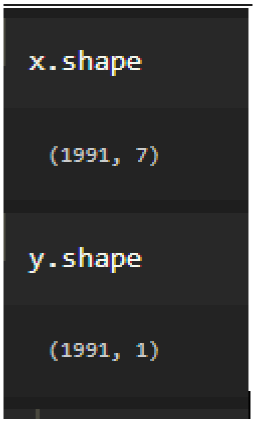
```
x=data.iloc[:,0:7].values
x
```



```
y=data.iloc[:,7:].values
y
```

From the above code “:” indicates that you are considering all the rows in the dataset and “0:7” indicates that you are considering columns 0 to 7 such as year, month, and day as input values and assigning them to variable x. In the same way in the second line “:” indicates you are considering all the rows and “7:” indicates that you are considering only the last column as output value and assigning them to variable y.

Let's Check the shape of x and Y



```
x.shape
```

```
(1991, 7)
```

```
y.shape
```

```
(1991, 1)
```

- You can see in x we have 1991 rows with 7 columns and y has 1 column with the same number of rows

Splitting The Data Into Train And Test:

To train the model, first split the model into two segments: "training data" and "testing data". The classifier is trained using a 'training data set' and the performance of the classifier is tested on a non-fitting 'test data set'.

Training Set: The training Set is material for computers to learn how to process data. The AI uses computation to do the training part. The training dataset is used to learn and tune the classifier parameters.

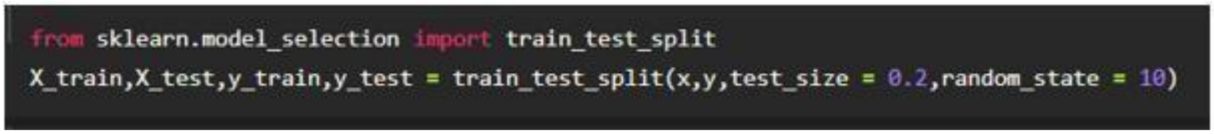
Test set: A set of unseen data used solely to evaluate the performance of thefully displayed classifier.

When you are working on a model and you want to train it, you obviously have a dataset. But after training, we have to test the model on some test dataset. For this, you will need a dataset that is different from the training set you used earlier. But it might not always be possible to haveso much data during the development phase. In such cases, the solution is to split the dataset into two sets, one for training and the other for testing.

To help us with this task, the Scikit library provides a tool, called the Model Selection library. There is a class in the library which is, ‘train_test_split.’ Using this we can easily split the dataset into the training and the testing datasets in various proportions.

The train-test split is a technique for evaluating the performance of a machine learning algorithm.

- Train Dataset:Used to fit the machine learning model.
- Test Dataset:Used to evaluate the fit machine learning model.



```
from sklearn.model_selection import train_test_split
X_train,X_test,y_train,y_test = train_test_split(x,y,test_size = 0.2,random_state = 10)
```

In general, you can allocate 80% of the dataset to the training set and the remaining 20% to the test set. We will create 4 sets

- x_train
- x_test
- y_train

- y_test .

There are a few other parameters that we need to understand before we use the class:

- test_size: this parameter decides the size of the data that has to be split as the test dataset. This is given as a fraction. For example, if you pass 0.5 as the value, the dataset will be split 50% as the test dataset and remaining a train dataset
- random_state: here you pass an integer, which will act as the seed for the random number generator during the split. Or, you can also pass an instance of the Random_state class, which will become the number generator. If you don’t pass anything, the Random_state instance used by np.random will be used instead.

1.2 PURPOSE

This is the project for a new web-based University Admit Eligibility Predictor. Predictor is an ML based application that asks for the users to input their academic transcripts data and calculates their chances of admission into the University Tier that they selected. It also provides an analysis of the data and shows how chances of admissions can depend on various factors. Thisdocument describes the scope, objectives and goals of the system. In addition to describing the non-functional requirements, this document models the functional requirements with use cases, interaction diagrams and class models. This document is intended to direct the design andimplementation of the target system in an object-oriented language.

2. LITERATURE SURVEY

2.1 Existing Problem

It’s almost admission season and I’ve couple of friends who are in panic mode waiting for a call from the universities they’ve applied at.

This made me think — How can we predict whether a student will get an admit or not? What are the parameters for selection? Can it be mathematically expressed?

All of these questions started popping up. This is the main existing problem.

2.2 References

- ➢ https://ieeexplore.ieee.org/document/9418279

A person’s education plays a vital role in their life. While planning for education students often have several questions regarding the courses, universities, job opportunities, expenses involved, etc. Securing admission in their dream university is one of their main concerns. It is seen that often students prefer to pursue their education from universities which have global recognition. And when it comes to international students the first choice of the majority of them is the United States of America. With the majority of worlds highly reputed universities, wide range of courses offered in every sector, highly accredited education system and teaching, scholarships provided to students, best job market and many more advantages make it the dream destination for the international students. According to research, there are above 8 million international students studying in more than 1700 public and 2500 private universities and colleges across the USA. (MasterPortal (2017)).

- ➢ https://ieeexplore.ieee.org/document/9410717

Bayesian Networks were used by (Thi et al. (2007)) to create a decision support system for evaluating the application submitted by international students in the university. This model was designed to predict the performance of the aspiring students by comparing them with the performance of students currently studying at the university and who had similar profiles during their application. In this way based on the current students' profile, the model predicted whether the aspiring student should be granted admission to the university. Since the comparisons were made only with the students who were already admitted to the university and the data of the students who were denied admission were not included in the research this model proved to be less efficient due to the problem of class imbalance.

- ➢ https://ieeexplore.ieee.org/document/6416521

(Abdul Fatah S; M (2012)) developed a model that can provide a list of universities/colleges were the best suitable for a student based on their academic records and college admission criteria. The model was developed by applying data mining techniques and knowledge discovery rules to the already existing in-house admission prediction system of the university. (Mane (2016)) conducted similar research that predicted the chance of a student getting admission to college based on their Senior Secondary School, Higher Secondary School, and Common Entrance Examination scoresusing the pattern growth approach to association rule mining.

- ➢ https://dl.acm.org/doi/10.1145/3388818.3393716

Acharya et al. (July 2020) proposed a comparative approach by developing four machine learning regression models: linear regression, support vector machine, decision tree, and random forest for predictive analytics of graduate admission chances. Then compute error functions for the developed models and compare their performances to select the best performing model out of these developed models the linear regression is the best performing model with an R2 score of 0.72. Janani Pet al. proposed a developed project that uses machine learning techniques specifically a decision tree algorithm based on the test attributes like GRE, TOEFL, CGPA, research papers, etc. According to their scores, the possibility of a chance of admission is calculated. The developed model has 93% accuracy.

GRADE system was developed by (Waters and Miikkulainen (2013)) to support the admission process for the graduate students in the University of Texas Austin Department of Computer Science. The main objective of the project was to develop a system that can help the admission committee of the university to take better and faster decisions. Logistic regression and SVM were used to create the model, both models performed equally well and the final system was developed using Logistic regression due to its simplicity. The time required by the admission committee to review the applications was reduced by 74% but human intervention was required to make the final decision on status if the application. (Nandeshwar et al. (2014)) created a similar model to predict the enrolment of the student in the university based on the factors like SAT score, GPA score, residency race etc. The Model was created using the Multiple Logistic regression algorithm, it was able to achieve accuracy rate of 67% only.

Analysis & Prediction of American Graduate Admissions Process by (Bhavya Ghai (2018)) This project tries to understand American Graduate Admissions process by specifically analyzing MS Computer Science application over past 5 years. They have tried to model admissions data based on patterns extracted from data and domain knowledge. The key to analyzing Graduate Admissions data is to analyze data in buckets rather than considering all in one bucket. The project aims to help students choose the right Universities by predicting whether a student will be admitted to a specific University.

This model uses four types of machine learning algorithms Decision Tree, Random Forest, AdaBoost and Naive Bayes and achieved highest accuracy of 69.79.

Applications of Supervised Learning Techniques on Undergraduate Admissions Data by (Thomas Lux,Randall Pittman,Maya Shende,Anil Shende(2016)) Here they discussed about the use of supervised learning techniques,namely perceptrons and support vector machines, in predicting admission decisions and enrollment based on historical applicant data. They show through experimental results that a classifier, trained and validated on previous years' data, can identify with reasonable accuracy those applicants that the admissions office is likely to accept (based on historical decisions made by the admissions office), and of the accepted applicants, those ones that are likely to enroll at the institution. Additionally, the results from our feature selection experiments can inform admissions offices of the significance of applicant features relative to acceptance and enrollment, thus aiding the office in future data collection and decision making. They achieved a highest accuracy of 94.57 in this model.

Student Admission Predictor by (HimanshuSonaware(2017)) Apart from these the education consultancy firms there are few websites and blogs that guide the students on the admission procedures. The drawback of the currently available resources is that they are very limited and also, they are not truly dependable taking into consideration of their accuracy and reliability. The aim of this research is to develop a system using machine learning algorithms. It will help the students to identify the chances of their application to a university being accepted. Also, it will help them in identifying the universities which are best suitable for their profile and also provide them with the details of those universities. A simple user interface will be developed for the users to access the SAP system.

Graduate Admission Prediction Using Machine Learning by (K. JeevanRatnakar, G.Koteswara Rao,DurgaPrasanth Kumar(2020)) 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. The machine learning models are multiple linear regression, k-nearest neighbor, random forest, and Multilayer Perception. Experiments show that the Multilayer Perception model surpasses other models with an accuracy of 95.43.

2.3 Problem Statement Definition

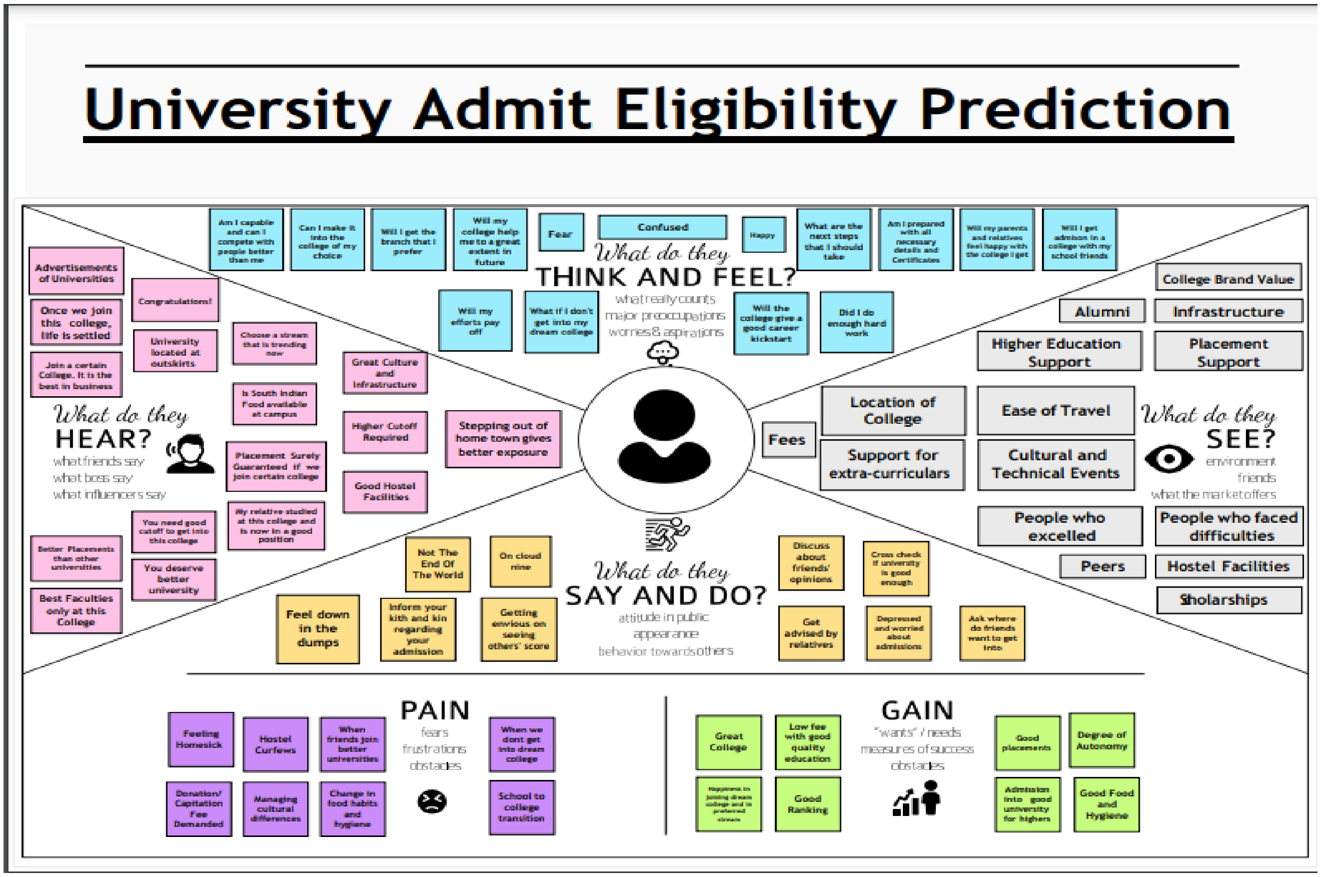
Educational institutions have always played an important role in society for development and growth of any individual. There are many college prediction apps and websites are being maintained, but using them is endless to some extent, due to the lack of accurate information from colleges. The problem statement is to design a college prediction system and to provide a probabilistic insight into college administration for overall rating, cut-offs of the colleges, admission intake and preferences of students. It helps students avoid spending time and money on counselor and stressful research related to finding a suitable college. We aim to provide a place which would give a perfect output as to how likely it is to enter into a university given upon their own details.

3. IDEATION AND PROPOSED SOLUTION

Ideation is the process where you generate ideas and solutions through sessions such as Sketching, Prototyping, Brainstorming, Brainwriting, Worst Possible Idea, and a wealth of other ideation techniques. Ideation is also the third stage in the Design Thinking process. In thisproject the ideation phase consist of,

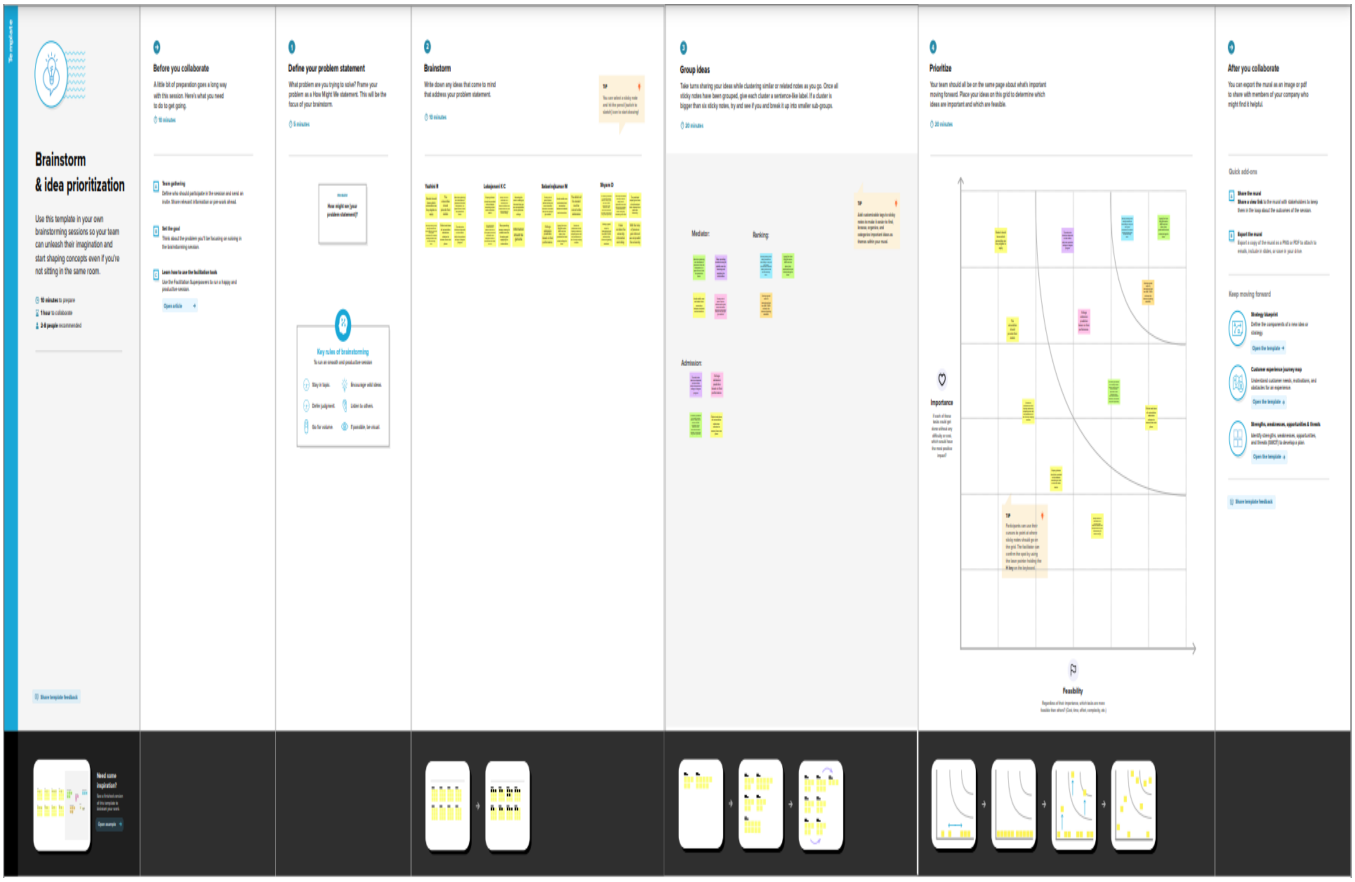
- Empathy Map
- Brainstorming
- Proposed Solution
- Problem Solution Fit

3.1 Empathy Map



University Admit Eligibility Prediction
Am I capable and can I compete with people better than me
Can I make it into the college of my choice
Will I get the branch that I prefer
Will my college help me to a great extent in future
Fear
Confused
Happy
What are the next steps that I should take
Am I prepared with all necessary details and Certificates
Will my parents and relatives feel happy with the college I get
Will I get admison in a college with my school friends
What do they
THINK AND FEEL?
what really counts
major preoccupations
worries & aspirations
Will my efforts pay off
What if I don't get into my dream college
Will the college give a good career kickstart
Did I do enough hard work
Advertisements of Universities
Congratulations!
Once we join this college, life is settled
University located at outskirts
Choose a stream that is trending now
Join a certain College. It is the best in business
Great Culture and Infrastructure
Is South Indian Food available at campus
What do they
HEAR?
what friends say
what boss say
what influencers say
Higher Cutoff Required
Stepping out of home town gives better exposure
Placement Surely Guaranteed if we join certain college
Good Hostel Facilities
My relative studied at this college and is now in a good position
You need good cutoff to get into this college
Better Placements than other universities
You deserve better university
Best Faculties only at this College
College Brand Value
Alumni
Infrastructure
Higher Education Support
Placement Support
Fees
Location of College
Ease of Travel
Support for extra-curriculars
Cultural and Technical Events
What do they
SEE?
environment
friends
what the marketoffers
People who excelled
People who faced difficulties
Peers
Hostel Facilities
Sholarships
Not The End Of The World
On cloud nine
Discuss about friends' opinions
Cross check if university is good enough
What do they
SAY AND DO?
attitude in public
appearance
behavior towardsothers
Feel down in the dumps
Inform your kith and kin regarding your admission
Getting envious on seeing others' score
Get advised by relatives
Depressed and worried about admissions
Ask where do friends want to get into
PAIN
fears
frustrations
obstacles
Feeling Homesick
Hostel Curfews
When friends join better universities
When we dont get into dream college
Donation/ Capitation Fee Demanded
Managing cultural differences
Change in food habits and hygiene
School to college transition
GAIN
"wants" / needs
measures of success
obstacles
Great College
Low fee with good quality education
Good placements
Degree of Autonomy
Happiness in joining dream college and in preferred stream
Good Ranking
Admission into good university for highers
Good Food and Hygiene

3.2Ideation & Brainstorming



Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

10 minutes to prepare
1 hour to collaborate
2-8 people recommended

Share template feedback

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

10 minutes

A Team gathering
Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B Set the goal
Think about the problem you'll be focusing on solving in the brainstorming session.

C Learn how to use the facilitation tools
Use the Facilitation Superpowers to run a happy and productive session.

Open article →

1 Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

5 minutes

How might we [your problem statement]?

Key rules of brainstorming
To run an smooth and productive session

Stay in topic. Encourage wild ideas.
Defer judgment. Listen to others.
Go for volume. If possible, be visual.

2 Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

TIP
You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

Yashini R
Lokajanani K C
Sabarirajkumar M
Shyam D

3 Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

TIP
Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

Mediator:
Ranking:
Admission:

4 Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes

Importance
If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?

Feasibility
Regardless of their importance, which tasks are more feasible than others? (Cost, time, effort, complexity, etc.)

TIP
Participants can use their cursors to point at where sticky notes should go on the grid. The facilitator can confirm the spot by using the laser pointer holding the H key on the keyboard.

After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

Quick add-ons

A Share the mural
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.

B Export the mural
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

Keep moving forward

Strategy blueprint
Define the components of a new idea or strategy.
Open the template →

Customer experience journey map
Understand customer needs, motivations, and obstacles for an experience.
Open the template →

Strengths, weaknesses, opportunities & threats
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.
Open the template →

Share template feedback

Need some inspiration?
See a finished version of this template to kickstart your work.
Open example →

2.1 Proposed Solution

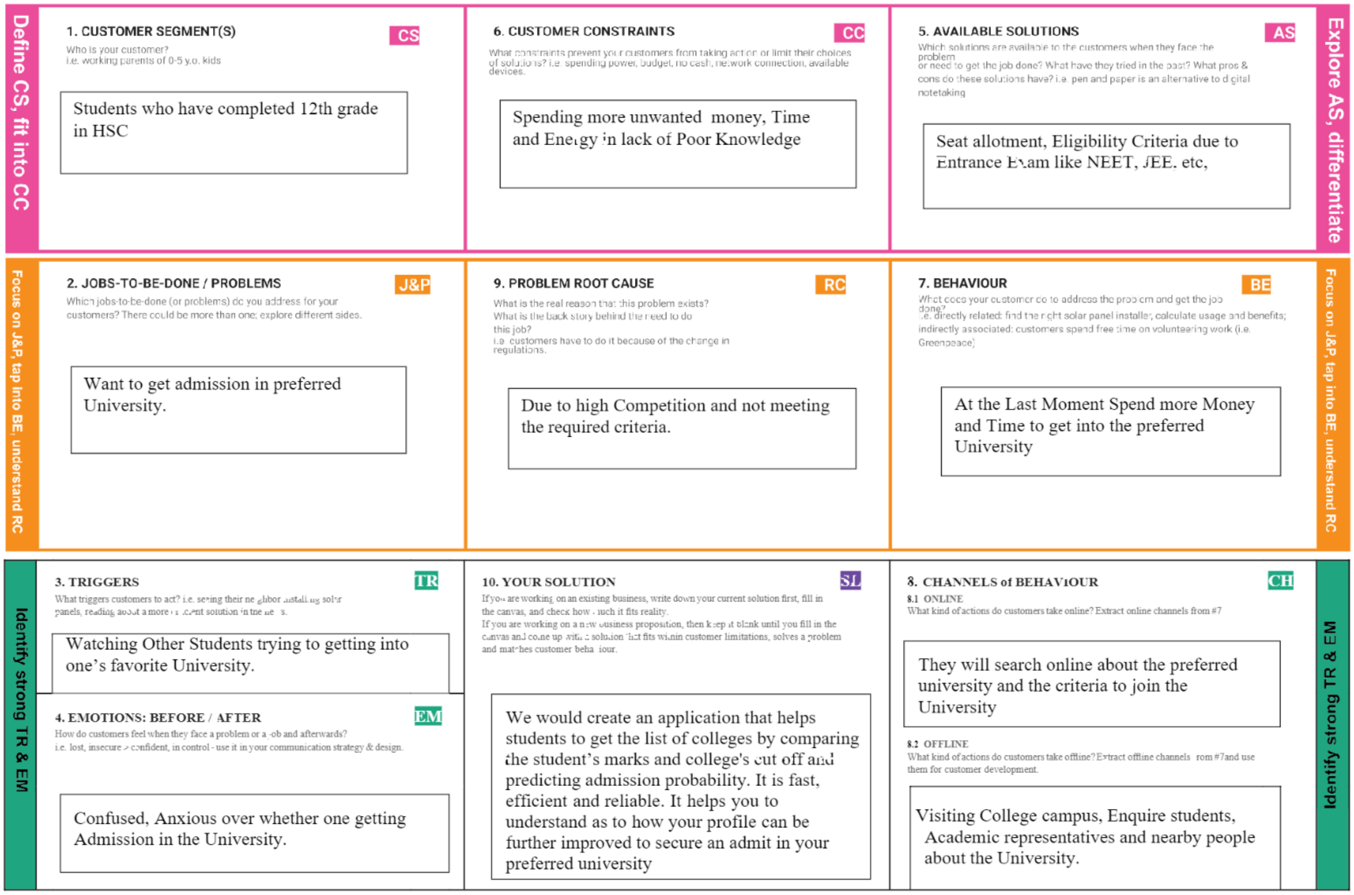
1.	Problem Statement (Problem to besolved)	Educational institutions have always played an important role in society for development and growth of any individual. There are many college prediction apps and websites are being maintained, but using them is endless to some extent, due to the lack of accurate information from colleges. The problem statement is to design a college prediction system and to provide a probabilistic insight into college administration for overall rating, cut-offs of the colleges, admission intake and preferences of students. It helps students avoid spending time and money on counselor and stressful research related to finding a suitable college. We aim to provide a place which would give a perfect output as to how likely it is to enter into a university given upon their own details
2.	Idea/ Solution description	University and College research being one part of the university application process is itself an arduous and lengthy task. These issues being a big problem for students have not been solved till now. There are recognized sites which filter the best universities and colleges based on the location, tuition fees, major and degree but none of them have use machine learning algorithm to solve the issue. Hence, we have done this research project to solve that issue to some extent with the use of data mining techniques.

3.	Novelty / Uniqueness	● University Application process itself being a tedious task Students needs lots of endeavor and determination for completing overall application process. It would definitely be easier forstudents if they get relief from step of selecting bestsuited universities and collegesfor application.

4.	Social Impact / Customer Satisfaction	● Results of this project are not applicable to college graduates of each and every major. Asthere was limitation of information on datasetthis system could not predict and recommenduniversities to students of every major.

5.	Business Model (Revenue Model)	From this project, financially can earn from the students admission fees but while they want to first select in their selected college in prediction. Although which is done by this project for prediction. In this project, this problem has been addressed 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 theSolution	In this project, this problem has been addressed by modeling a recommender system based on various classification algorithms. To predict the best University for the particular student his/her GPA score, GRE (Verbal and Quant) Score, TOEFL score has been used as attributes for classification. K nearest neighbor has been used to predict best University and K means clustering has been used to find more similar universities. Support Vector Machine and random forest has been used to predict the admission chance of particular student on specific University.

2.2 Problem Solution Fit



Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

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

Students who have completed 12th grade in HSC

6. CUSTOMER CONSTRAINTS 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.

Spending more unwanted money, Time and Energy in lack of Poor Knowledge

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 notetaking

Seat allotment, Eligibility Criteria due to Entrance Exam like NEET, JEE, etc,

Explore AS, differentiate

Focus on J&P, tap into BE, understand RC

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.

Want to get admission in preferred University.

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.

Due to high Competition and not meeting the required criteria.

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. Greenpeace)

At the Last Moment Spend more Money and Time to get into the preferred University

Focus on J&P, tap into BE, understand RC

Identify strong TR & EM

3. TRIGGERS TR

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

Watching Other Students trying to getting into one's favorite University.

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 over whether one getting Admission in the University.

10. YOUR SOLUTION SL

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.

We would create an application that helps students to get the list of colleges by comparing the student's marks and college's cut off and predicting admission probability. 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 preferred university

8. CHANNELS of BEHAVIOUR CH

8.1 ONLINE

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

They will search online about the preferred university and the criteria to join the University

8.2 OFFLINE

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

Visiting College campus, Enquire students, Academic representatives and nearby people about the University.

Identify strong TR & EM

3. REQUIREMENT ANALYSIS

3.1 Functional Requirements

Following are the functional requirements of the proposed solution.

FR No.	**Functional Requirement (Epic)**	**Sub Requirement (Story / Sub-Task)**
FR-1	User Profile	Complete user profile by providing the Student Academic details.
FR-2	User Search	Search for desired University based on their Academic Performance and eligibility criteria.
FR-3	User Preference	Search for Universities based on their location preference.
FR-4	Result	The list of universities is filtered based on the eligibility of the students where the order of the list will be based on the ratings of the university.

3.2 Non-functional Requirements:

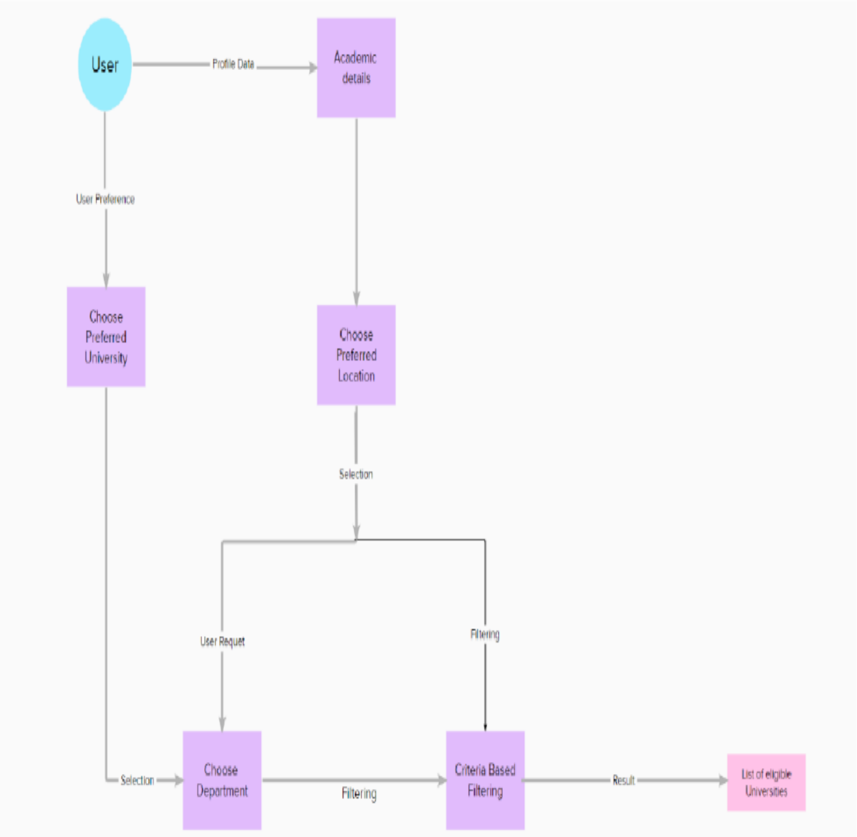
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Filters the universities based on the user profile.
NFR-2	**Security**	User details are secured from unauthorised parties.
NFR-3	**Reliability**	The users can find universities based on their preferred location and results.
NFR-4	**Performance**	The website will provide the list of universities within 30 seconds.
NFR-5	**Availability**	Students across India can access the website anytime.
NFR-6	**Scalability**	The solution will be helpful for the students in India to know the details about universities they are eligible

4. PROJECT DESIGN

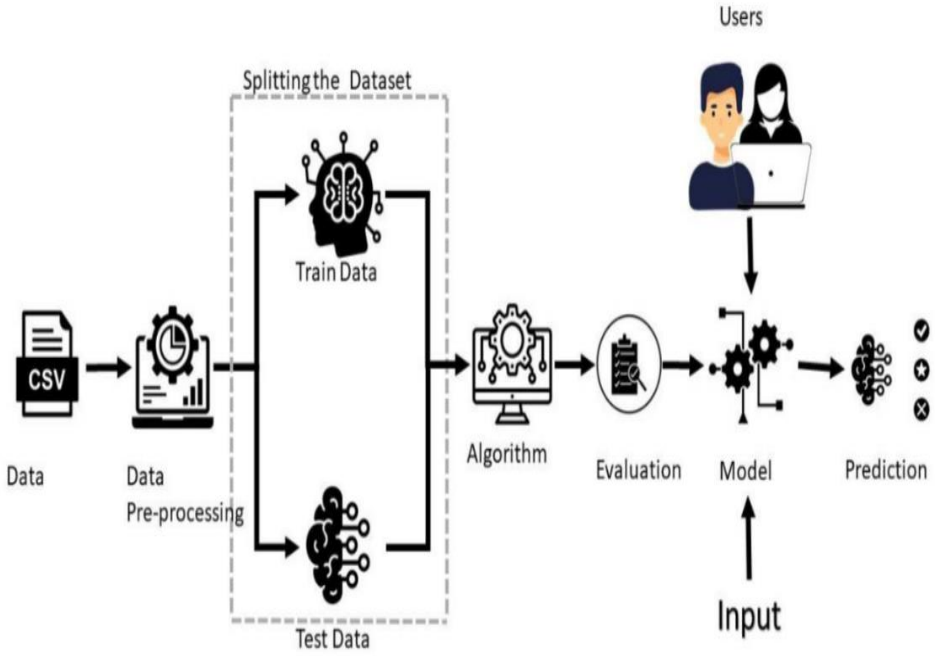
4.1 Data Flow Diagram

Data Flow Diagram:

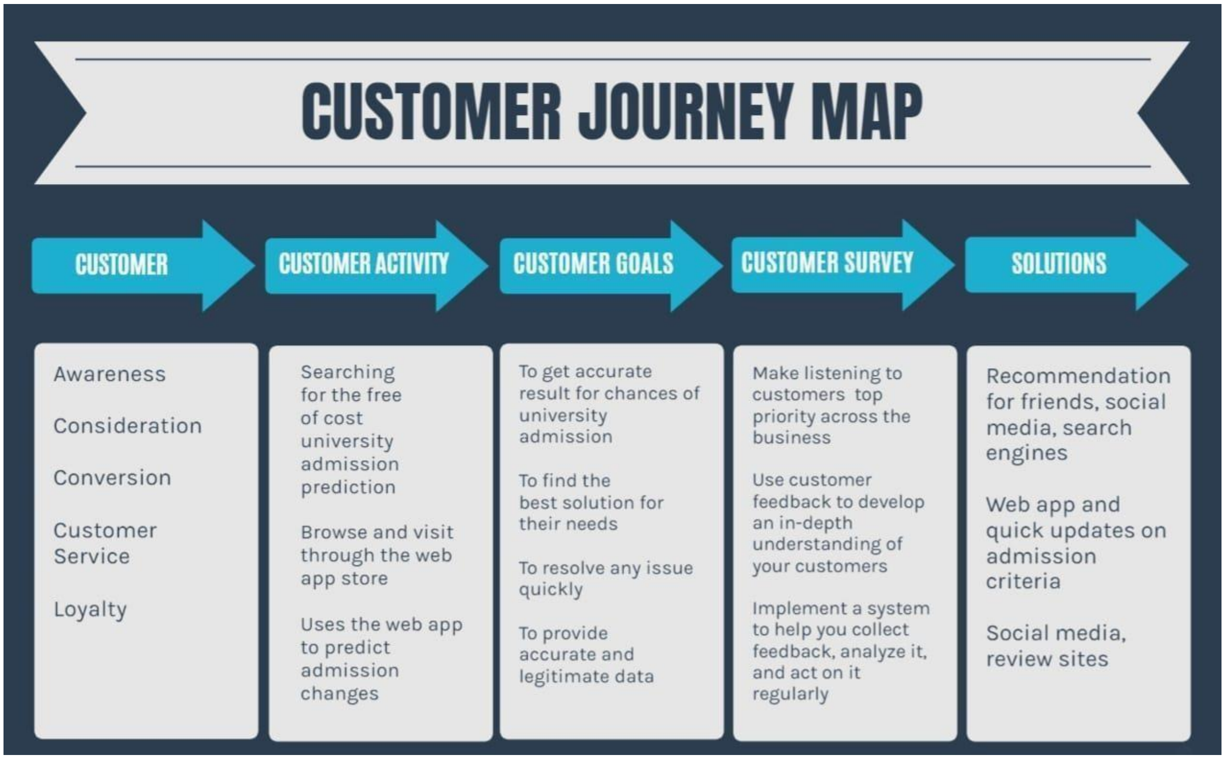


4.2 Solution & Technical Architecture

Solution Architecture Diagram:



4.3 User Stories

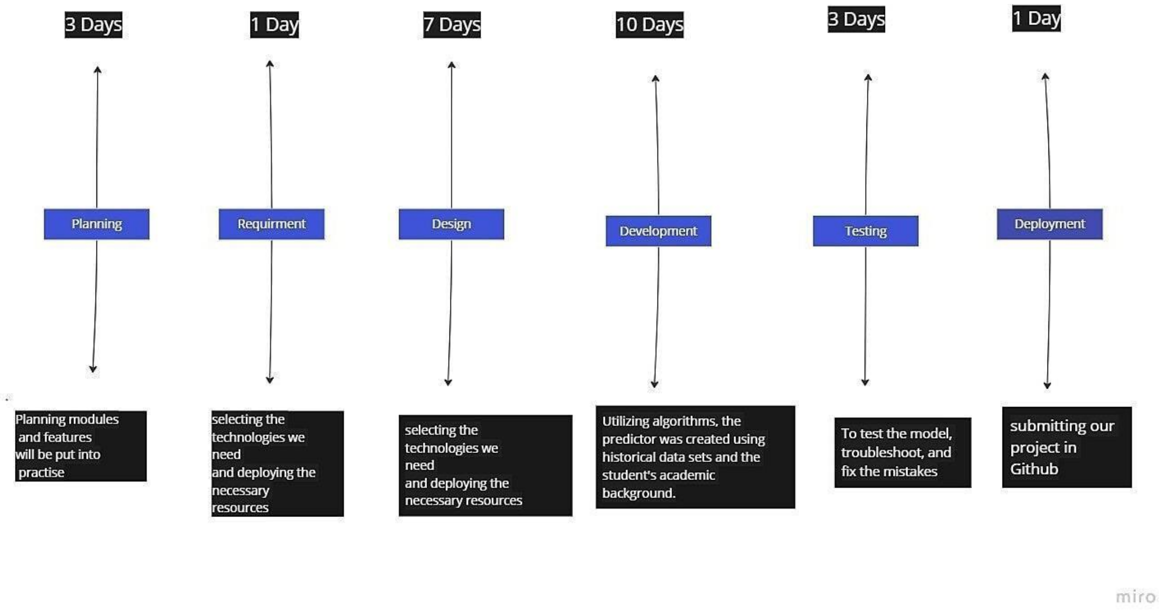


CUSTOMER JOURNEY MAP

CUSTOMER	CUSTOMER ACTIVITY	CUSTOMER GOALS	CUSTOMER SURVEY	SOLUTIONS
Awareness Consideration Conversion Customer Service Loyalty	Searching for the free of cost university admission prediction Browse and visit through the web app store Uses the web app to predict admission changes	To get accurate result for chances of university admission To find the best solution for their needs To resolve any issue quickly To provide accurate and legitimate data	Make listening to customers top priority across the business Use customer feedback to develop an in-depth understanding of your customers Implement a system to help you collect feedback, analyze it, and act on it regularly	Recommendation for friends, social media, search engines Web app and quick updates on admission criteria Social media, review sites

5. PROJECT PLANNING & SCHEDULING

5.1 Sprint Planning & Estimation



Planning modules and features will be put into practise

selecting the technologies we need and deploying the necessary resources

selecting the technologies we need and deploying the necessary resources

Utilizing algorithms, the predictor was created using historical data sets and the student's academic background.

To test the model, troubleshoot, and fix the mistakes

submitting our project in Github

5.2 Sprint Delivery Schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story/ Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, you can register in the application by entering your emailaddress, password,	2	High	Yazhini R

			and confirming thepassword			
Sprint-1		USN-2	As a user, you will receive a confirmation emailafter registering in the application	1	High	Yazhini R
Sprint-2		USN-3	As a user, youcan register in the application via Facebook	2	Low	Shyam D
Sprint-1		USN-4	As a user, you can register in the application via Gmail	2	Medium	Sabari Raj Kumar M
Sprint-1	Login	USN-5	As a user, you can login to the application by entering your emailand password	1	High	Lokajanani K C

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	5 Days	29 Oct 2022	04 Nov 2022	20	03 Nov 2022
Sprint-2	20	4 Days	04 Oct 2022	08 Nov 2022	20	07 Nov 2022
Sprint-3	20	4 Days	08 Nov 2022	11 Nov 2022	20	10 Nov 2022
Sprint-4	20	4 Days	11 Nov 2022	14 Nov 2022	20	13 Nov 2022

Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let’s calculate the team’s average velocity (AV) per iteration unit (story points perday)

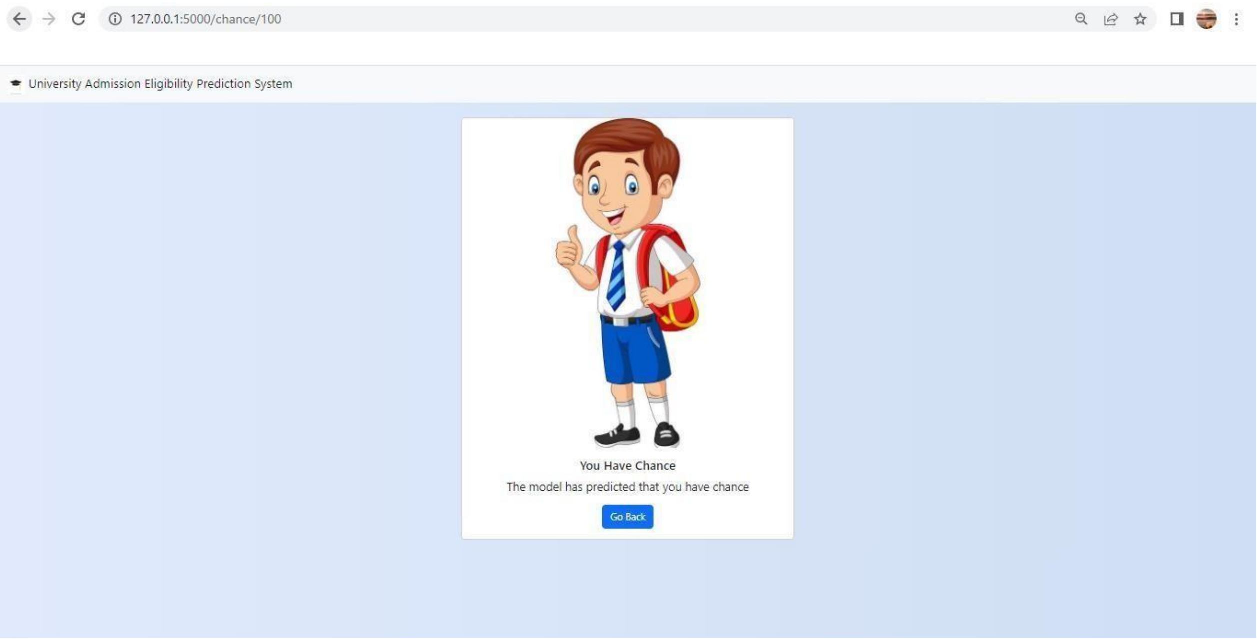
Burndown Chart:

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts canbe applied to any project containing measurable progress over time.

6. CODING & SOLUTIONING

6.1 Feature 1

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



127.0.0.1:5000/chance/100
University Admission Eligibility Prediction System
Go Back

You Have Chance

The model has predicted that you have chance

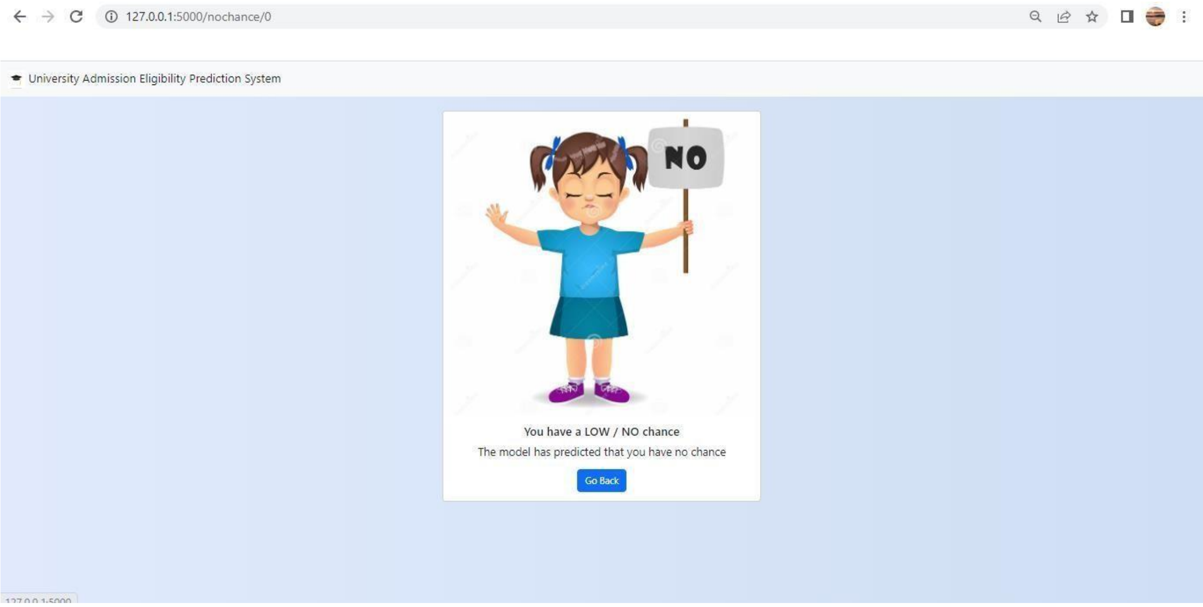
Source Code :

```
{% extends 'index.html' %}

 {% block body %}

 <div class="container text-center p-4">

    <div class="d-flex justify-content-center">

          <div class="card" style="width: 34rem;">

             <img src="..\static\img\chance.png" class="card-img-top" alt="...">

             <div class="card-body">

                 <h5 class="card-title">You Have Chance</h5>
```

```
        <p class="card-text">The model has predicted that you have chance</p>

        <a href="/home" class="btn btn-primary">Go Back</a>

      </div>

    </div>

  </div>

</div>

 {% endblock %}
```

6.2 Feature 2

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



127.0.0.1:5000/nochance/0

University Admission Eligibility Prediction System

You have a LOW / NO chance

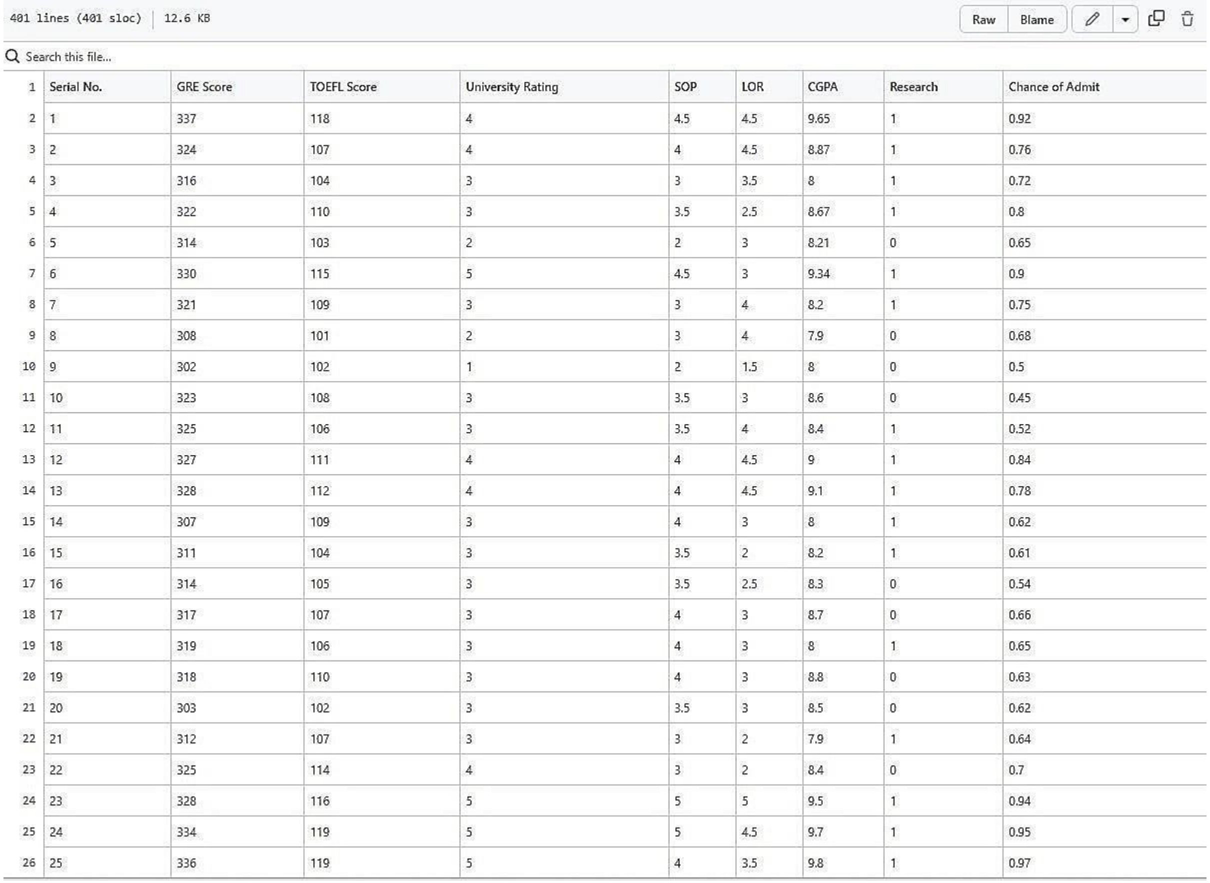
The model has predicted that you have no chance

Source Code:

```
{% extends 'index.html' %}
{% block body %}

<div class="container text-center p-4">
    <div class="d-flex justify-content-center">
        <div class="card" style="width: 34rem;">
            <img src="..\static\img\Nochance.jpg" class="card-img-top" alt="...">
            <div class="card-body">
                <h5 class="card-title">You have a LOW / NO chance</h5>
                <p class="card-text">The model has predicted that you  have no chance</p>
                <a href="/home" class="btn btn-primary">Go Back</a>
            </div>
        </div>
    </div>
</div>
{% endblock %}
```

6.3 Database Schema

The database used here in this project was Admission_Predict.csv. The sample screenshot of the database are,



Serial No.	GRE Score	TOEFL Score	University Rating	SOP	LOR	CGPA	Research	Chance of Admit
1	337	118	4	4.5	4.5	9.65	1	0.92
2	324	107	4	4	4.5	8.87	1	0.76
3	316	104	3	3	3.5	8	1	0.72
4	322	110	3	3.5	2.5	8.67	1	0.8
5	314	103	2	2	3	8.21	0	0.65
6	330	115	5	4.5	3	9.34	1	0.9
7	321	109	3	3	4	8.2	1	0.75
8	308	101	2	3	4	7.9	0	0.68
9	302	102	1	2	1.5	8	0	0.5
10	323	108	3	3.5	3	8.6	0	0.45
11	325	106	3	3.5	4	8.4	1	0.52
12	327	111	4	4	4.5	9	1	0.84
13	328	112	4	4	4.5	9.1	1	0.78
14	307	109	3	4	3	8	1	0.62
15	311	104	3	3.5	2	8.2	1	0.61
16	314	105	3	3.5	2.5	8.3	0	0.54
17	317	107	3	4	3	8.7	0	0.66
18	319	106	3	4	3	8	1	0.65
19	318	110	3	4	3	8.8	0	0.63
20	303	102	3	3.5	3	8.5	0	0.62
21	312	107	3	3	2	7.9	1	0.64
22	325	114	4	3	2	8.4	0	0.7
23	328	116	5	5	5	9.5	1	0.94
24	334	119	5	5	4.5	9.7	1	0.95
25	336	119	5	4	3.5	9.8	1	0.97

7. TESTING

7.1 Test Cases

Test Case Analysis

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

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	7	0	0	7
Client Application	51	0	0	51
Security	2	0	0	2
Outsource Shipping	3	0	0	3
Exception Reporting	9	0	0	9
Final Report Output	4	0	0	4
Version Control	2	0	0	2

7.2 User Acceptance Testing

- **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).

- **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	10	4	2	3	19
Duplicate	0	0	0	0	0
External	2	3	0	1	6
Fixed	11	2	4	20	37
Not Reproduced	0	0	0	0	0
Skipped	0	0	1	1	2
Won't Fix	0	0	0	0	0
Totals	24	14	13	26	64

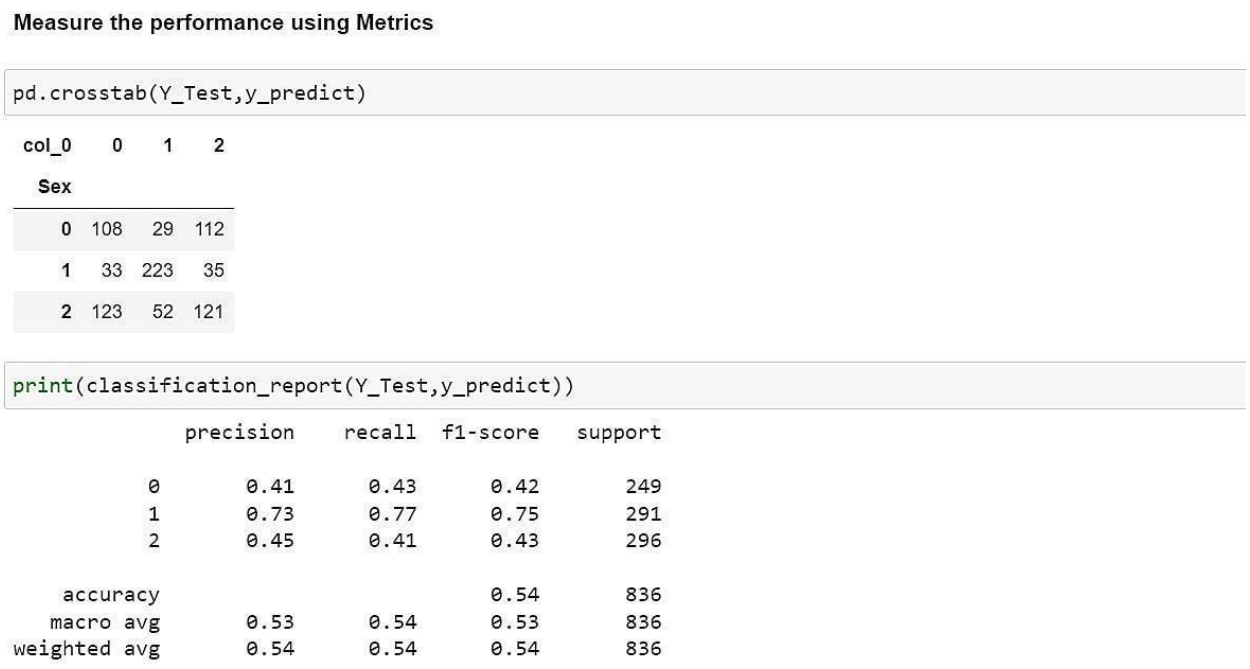
Test Case Analysis

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

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	7	0	0	7
Client Application	51	0	0	51
Security	2	0	0	2
Outsource Shipping	3	0	0	3
Exception Reporting	9	0	0	9
Final Report Output	4	0	0	4
Version Control	2	0	0	2

8. RESULTS

8.1 Performance Metrics



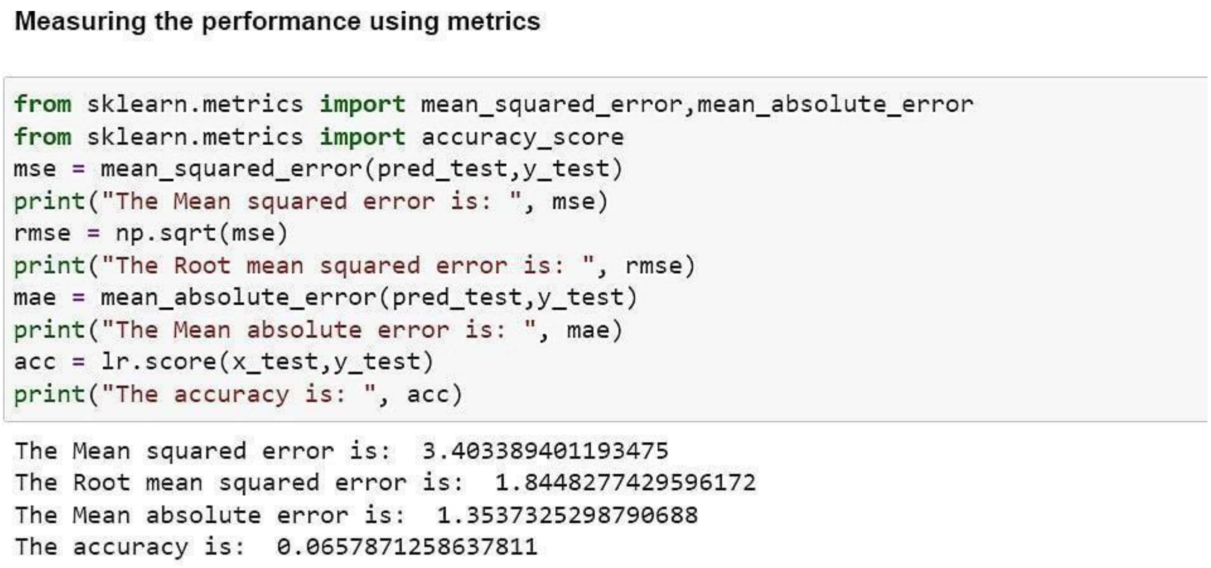
Measure the performance using Metrics

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

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

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

```
              precision    recall  f1-score   support

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

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



Measuring the performance using metrics

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

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

9. ADVANTAGES & DISADVANTAGES

9.1 Advantages

- 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.

9.2 Dis-Advantages

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

10. CONCLUSION

This system ,being the first we have created in Python using ML algorithms and other front end languages such as html, css, java script , has proven more difficult than originally imagined. While it may sound simple to fill out a few forms and process the information, much more is involved in the selection of applicants than this. Every time progress was made and features were added, ideas for additional features or methods to improve the usability of the system made themselves apparent. Furthermore, adding one feature meant that another required feature was now possible, and balancing completing these required features with the ideas for improvement as well as remembering everything that had to be done was a project in itself. Debugging can sometimes be a relatively straight forward process, or rather rather finding out what you must debug can be. Since so many parts of the admissions system are integrated into one another, if an error occurs on one page, it may be a display error, for example; it may be the information is not correctly read from the database; or even that the information is not correctly stored in the database initially, and all three must be checked on each occasion. This slows down the process and can be frustrating if the apparent cause of a problem is not obvious at first. Language used must be simple and easy to understand and compatibility is paramount. If this system were not designed as an entirely web based application, it would not have been possible to recreate its current state of portability. Overall, the system performs well,and while it does not include all of the features that may have been desired, it lives up to initial expectations. The majority of features that are included work flawlessly and the errors that do exist are minor or graphical.

11. 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.

12. APPENDIX

12.1 Source Code

PYTHON CODE

Uploading the python code ,

IMPORT STATEMENTS

In [1]:

```
import  numpy  as  np
import  pandas  as  pd
import seaborn as sns
import matplotlib.pyplot as plt
%matplotlib inline
```

LOAD THE DATASET

In [2]:

```
import os, types
import pandas as pd
from botocore.client import Config
import ibm_boto3

def__iter_(self): return 0

# @hidden_cell
# The following code accesses a file in your IBM Cloud Object Storage. It includes your credentials.
# You might want to remove those credentials before you share the notebook.
cos_client = ibm_boto3.client(service_name='s3',
    ibm_api_key_id='T6FhPnWEPrnR91XKAfpiopbqTZ8j-gbLtjakMGexd6v0',
    ibm_auth_endpoint="https://iam.cloud.ibm.com/oidc/token",
    config=Config(signature_version='oauth'),
    endpoint_url='https://s3.private.us.cloud-object-storage.appdomain.cloud')

bucket = 'university-donotdelete-pr-1ijujvyruwxy5c'
object_key = 'Admission_Predict.csv'

body = cos_client.get_object(Bucket=bucket,Key=object_key)['Body']
# add missing___iter___method, so pandas accepts body as file-like object
if not hasattr(body, "__iter__"): body.__iter___= types.MethodType(___iter_, body )

data = pd.read_csv(body)
data.head()
```

Out[2]:

	Serial No.	**GRE Score**	**TOEFL Score**	**University Rating**	**SOP**	**LOR**	**CGPA**	**Research**	**Chance of Admit**
0	1	337	118	4	4.5	4.5	9.65	1	0.92
1	2	324	107	4	4.0	4.5	8.87	1	0.76

2	3	316	104	3	3.0	3.5	8.00	1	0.72
3	4	322	110	3	3.5	2.5	8.67	1	0.80
4	5	314	103	2	2.0	3.0	8.21	0	0.65

In [3]:

```
data.drop(["Serial No."], axis=1, inplace=True)
```

In [4]:

```
data.describe()
```

Out[4]:

	GRE Score	**TOEFL Score**	**University Rating**	**SOP**	**LOR**	**CGPA**	**Research**	**Chance of Admit**
count	400.000000	400.000000	400.000000	400.000000	400.000000	400.000000	400.000000	400.000000
mean	316.807500	107.410000	3.087500	3.400000	3.452500	8.598925	0.547500	0.724350
std	11.473646	6.069514	1.143728	1.006869	0.898478	0.596317	0.498362	0.142609
min	290.000000	92.000000	1.000000	1.000000	1.000000	6.800000	0.000000	0.340000
25%	308.000000	103.000000	2.000000	2.500000	3.000000	8.170000	0.000000	0.640000
50%	317.000000	107.000000	3.000000	3.500000	3.500000	8.610000	1.000000	0.730000
75%	325.000000	112.000000	4.000000	4.000000	4.000000	9.062500	1.000000	0.830000
max	340.000000	120.000000	5.000000	5.000000	5.000000	9.920000	1.000000	0.970000

In [5]:

```
data.info()
```

Out[5]:

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 400 entries, 0 to 399
```

```
Data columns (total 8 columns):
 #   Column             Non-Null Count  Dtype
---  -------            --------------  ------
 0   GRE Score          400 non-null    int64
 1   TOEFL Score        400 non-null    int64
 2   University Rating  400 non-null    int64
 3   SOP                400 non-null    float64
 4   LOR                400 non-null    float64
 5   CGPA               400 non-null    float64
 6   Research           400 non-null    int64
 7   Chance of Admit    400 non-null    float64
dtypes: float64(4), int64(4)
memory usage: 25.1 KB
```

In [6]:

```
data.isnull().sum()
```

Out[6]:

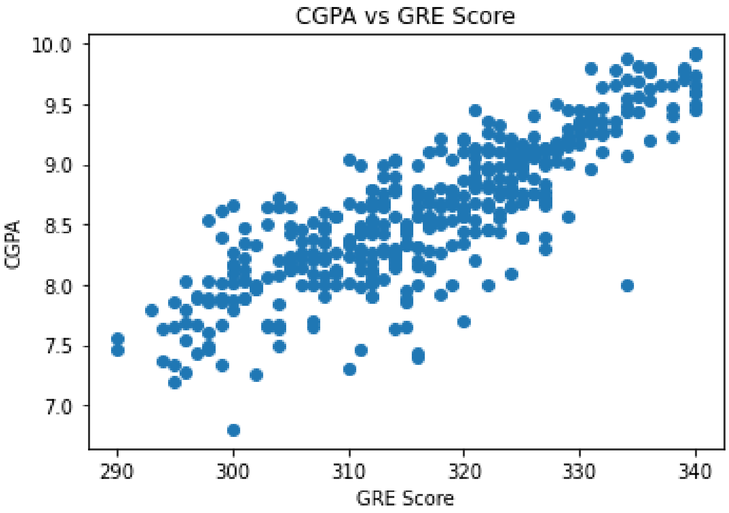
```
GRE Score            0
TOEFL Score          0
University Rating    0
SOP                  0
LOR                  0
CGPA                 0
Research             0
Chance of Admit      0
dtype: int64
```

VISUALIZATION

In [7]:

```
plt.scatter(data['GRE Score'],data['CGPA'])
plt.title('CGPA vs GRE Score')
plt.xlabel('GRE Score')
plt.ylabel('CGPA')
plt.show()
```

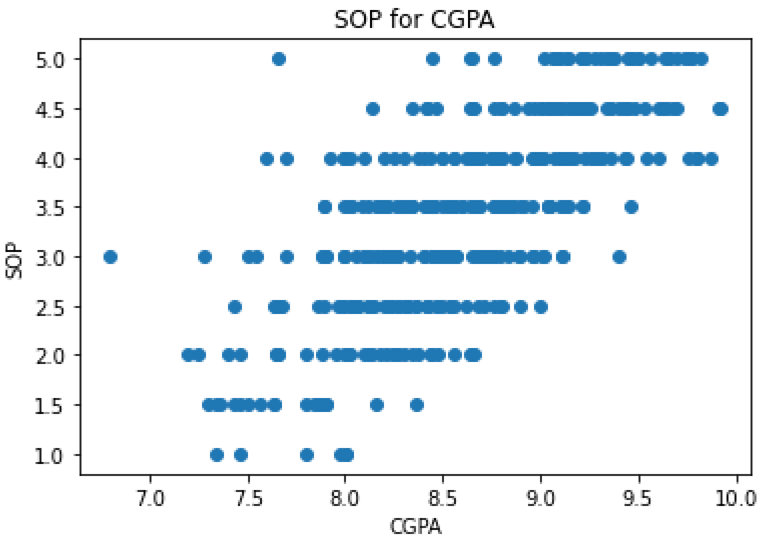
Out [7]:



In [8]:

```
plt.scatter(data['CGPA'],data['SOP'])
plt.title('SOP for CGPA')
plt.xlabel('CGPA')
plt.ylabel('SOP')
plt.show()
```

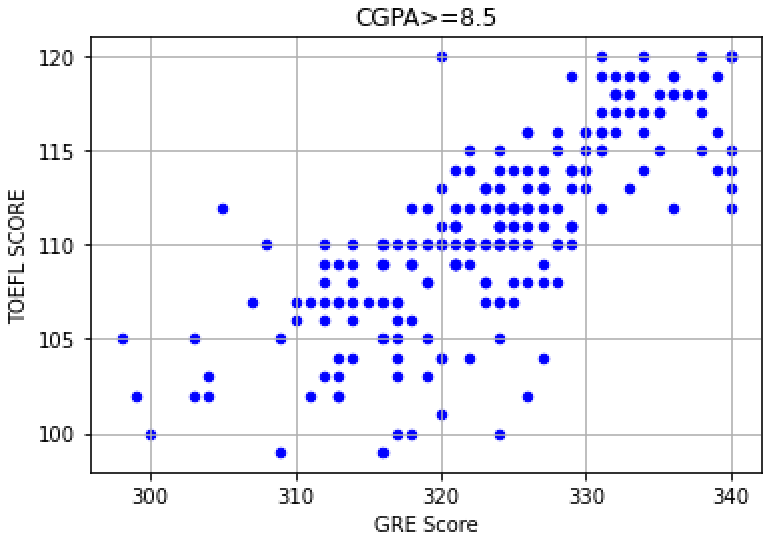
Out [9]:



In [9]:

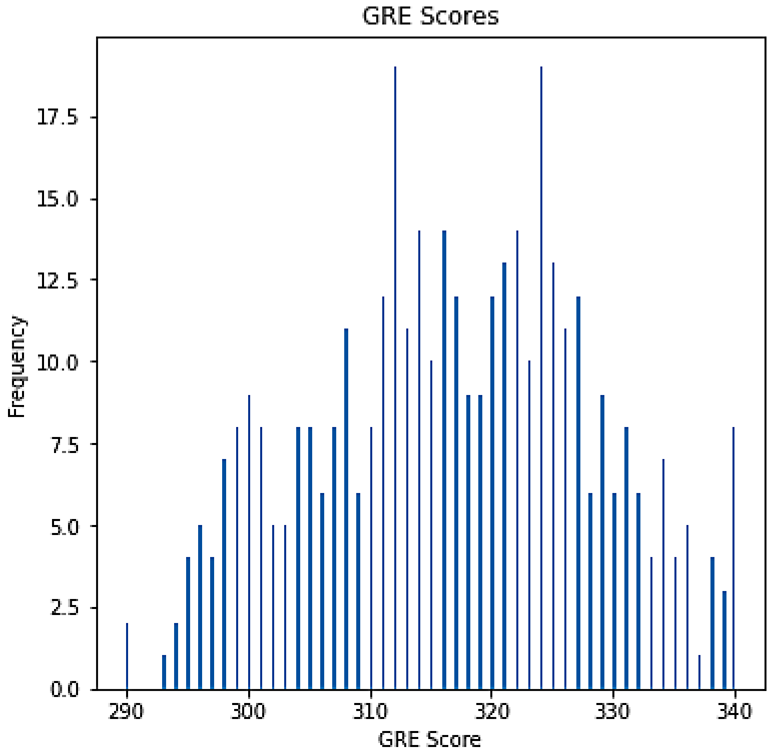
```
data[data.CGPA >= 8.5].plot(kind='scatter', x='GRE Score', y='TOEFL Score',color="BLUE")
 plt.xlabel("GRE Score")
plt.ylabel("TOEFL SCORE")
plt.title("CGPA>=8.5")
plt.grid(True)
plt.show()
```

Out [9]:



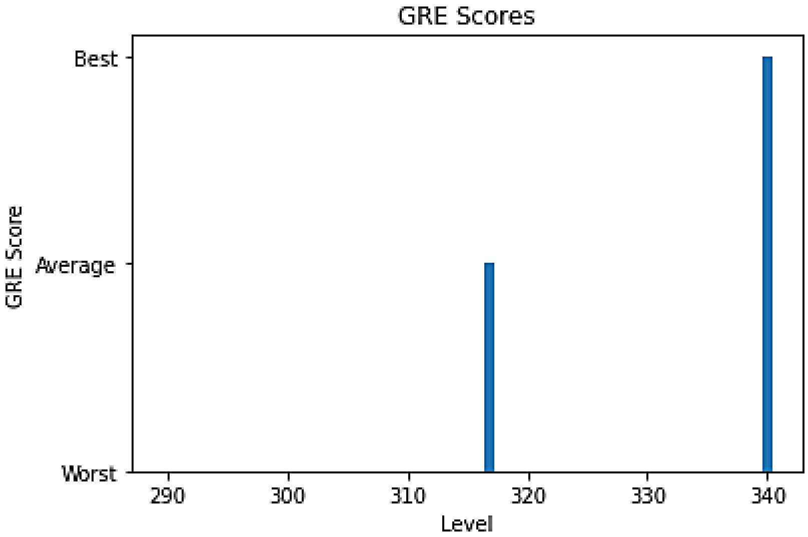
In [10]:

```
data["GRE Score"].plot(kind = 'hist',bins = 200,figsize = (6,6))
plt.title("GRE Scores")
plt.xlabel("GRE Score")
plt.ylabel("Frequency")
plt.show()
```



In[11]:

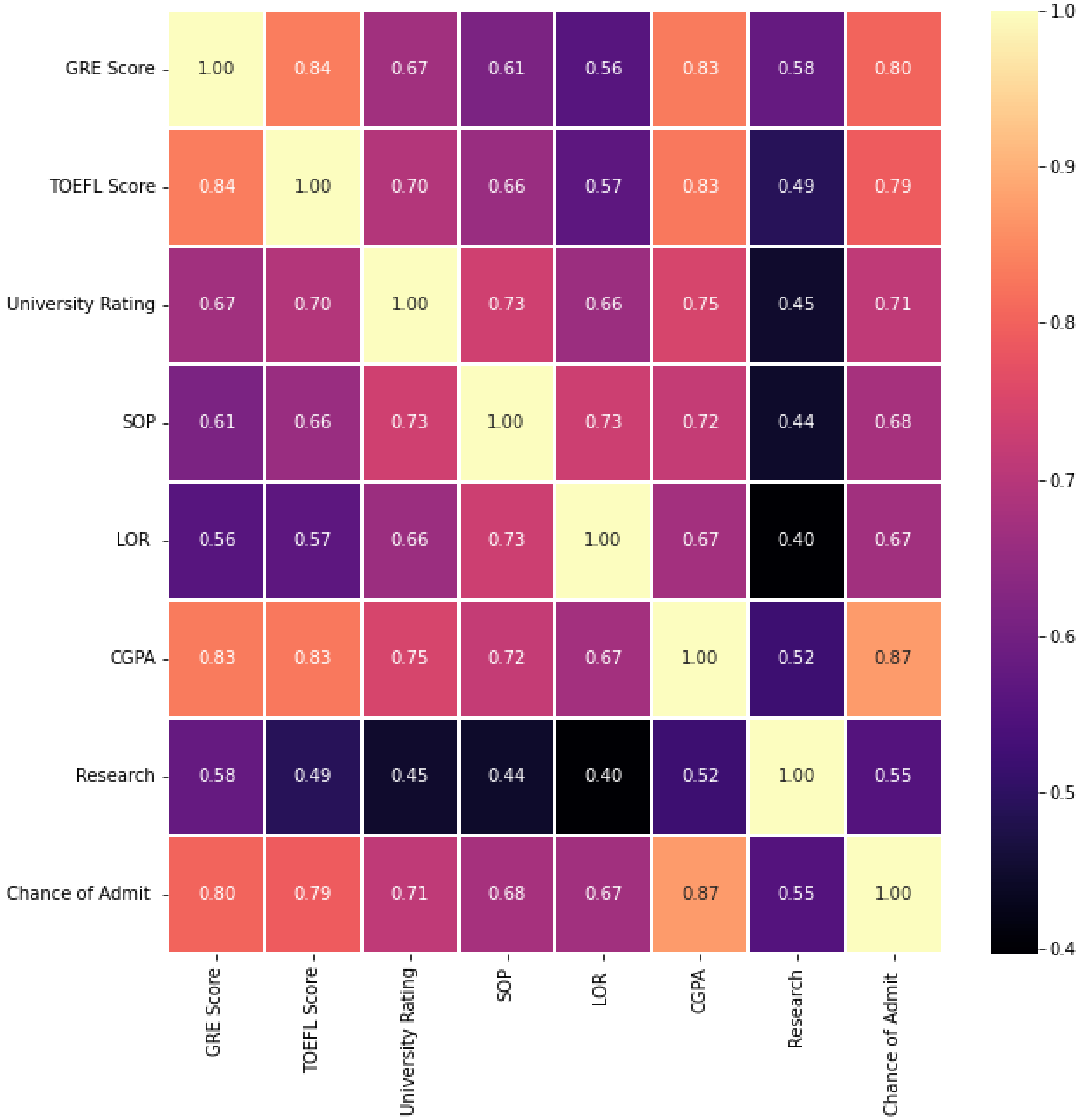
```
p = np.array([data["TOEFL Score"].min(),data["TOEFL Score"].mean(),data["TOEFL Score"].max()])
r = ["Worst","Average","Best"]
plt.bar(p,r)

plt.title("TOEFL Scores")
plt.xlabel("Level")
plt.ylabel("TOEFL Score")
plt.show()
```



In[13]:

```
plt.figure(figsize=(10, 10))
sns.heatmap(data.corr(), annot=True, linewidths=0.05, fmt= '.2f',cmap="magma")
plt.show()
```

Out[13]:

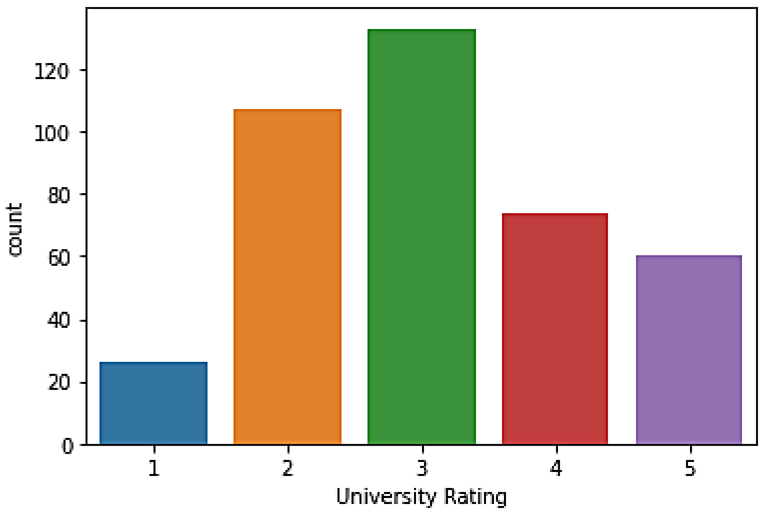


In[14]:

```
data.Research.value_counts()
sns.countplot(x="University Rating",data=data)
```

Out[14]:

```
<AxesSubplot:xlabel='University Rating', ylabel='count'>
```

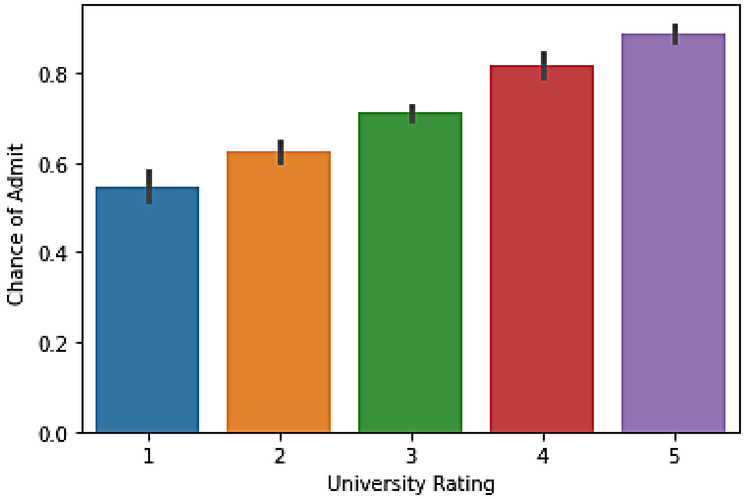


In[15]:

```
sns.barplot(x="University Rating", y="Chance of Admit ", data=data)
```

Out[15]:

```
<AxesSubplot:xlabel='University Rating', ylabel='Chance of Admit '>
```



TRAINING AND TESTING SPLIT

In [16]:

```
X=data.drop(['Chance of Admit '],axis=1) #input data_set
y=data['Chance of Admit '] #output labels
```

In [17]:

```
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.15)
```

MODELING AND TRAINING

In [18]:

```
from sklearn.ensemble import GradientBoostingRegressor
rgr =  GradientBoostingRegressor()
rgr.fit(X_train,y_train)
```

Out[18]:

```
GradientBoostingRegressor()
```

In a Jupyter environment, please rerun this cell to show the HTML representation or trust the notebook. On GitHub, the HTML representation is unable to render, please try loading this page with nbviewer.org.

In [19]:

```
rgr.score(X_test,y_test)
```

Out[19]:

```
0.7214021715194154
```

In [20]:

```
y_predict=rgr.predict(X_test)
```

In [21]:

```
from sklearn.metrics import mean_squared_error, r2_score,mean_absolute_error
```

```
import numpy as np
print('Mean Absolute Error:', mean_absolute_error(y_test, y_predict))
print('Mean Squared Error:', mean_squared_error(y_test, y_predict))
print('Root Mean Squared Error:', np.sqrt(mean_squared_error(y_test, y_predict)))
Mean Absolute Error: 0.061115035673946834
Mean Squared Error: 0.007194293635482686
Root Mean Squared Error: 0.08481918200196631
```

In [22]:

```
y_train = (y_train>0.5)
y_test = (y_test>0.5)
```

In [23]:

```
from sklearn.linear_model._logistic import LogisticRegression
lore = LogisticRegression(random_state=0, max_iter=1000)
lr = lore.fit(X_train, y_train)
```

In [24]:

```
y_pred = lr.predict(X_test)
```

In [25]:

```
from sklearn.metrics import accuracy_score, recall_score, roc_auc_score, confusion_matrix
print('Accuracy Score:', accuracy_score(y_test, y_pred))
print('Recall Score:', recall_score(y_test, y_pred))
print('ROC AUC Score:', roc_auc_score(y_test, y_pred))
print('Confussion Matrix:\n', confusion_matrix(y_test, y_pred))
```

Out [25]:

```
Accuracy Score: 0.9166666666666666
Recall Score: 1.0
ROC AUC Score: 0.7222222222222222
Confussion Matrix:
 [[ 4 5]
 [ 0 51]]
```

SAVING THE MODEL

In [26]:

```
import pickle
```

In [27]:

```
pickle.dump(lr, open("university.pkl", "wb")) #logistic regression model
```

HOSTING THE MODEL

In [28]:

```
import pickle
```

In [29]:

```
lr = pickle.load(open("university.pkl", "rb")) #logistic regression model
```

In [30]:

```
pip install -U ibm-watson-machine-learning
```

Out [30]:

```
Requirement already satisfied: ibm-watson-machine-learning in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (1.0.255)
Collecting ibm-watson-machine-learning
  Downloading ibm_watson_machine_learning-1.0.256-py3-none-any.whl (1.8 MB)
     |████████████████████████████████| 1.8 MB 22.1 MB/s eta 0:00:01
Requirement already satisfied: packaging in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-watson-machine-learning) (21.3)
Requirement already satisfied: importlib-metadata in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-watson-machine-learning) (4.8.2)
Requirement already satisfied: urllib3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-watson-machine-learning) (1.26.7)
Requirement already satisfied: lomond in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-watson-machine-learning) (0.3.3)
Requirement already satisfied: pandas<1.5.0,>=0.24.2 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-watson-machine-learning) (1.3.4)
Requirement already satisfied: ibm-cos-sdk==2.11.* in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-watson-machine-learning) (2.11.0)
Requirement already satisfied: requests in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-watson-machine-learning) (2.26.0)
Requirement already satisfied: tabulate in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-watson-machine-learning) (0.8.9)
Requirement already satisfied: certifi in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-watson-machine-learning) (2022.9.24)
Requirement already satisfied: ibm-cos-sdk-s3transfer==2.11.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-cos-sdk==2.11.*->ibm-watson-machine-learning) (2.11.0)
Requirement already satisfied: jmespath<1.0.0,>=0.7.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-cos-sdk==2.11.*->ibm-watson-machine-learning) (0.10.0)
Requirement already satisfied: ibm-cos-sdk-core==2.11.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-cos-sdk==2.11.*->ibm-watson-machine-learning) (2.11.0)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-cos-sdk-core==2.11.0->ibm-cos-sdk==2.11.*->ibm-watson-machine-learning) (2.8.2)
Requirement already satisfied: pytz>=2017.3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from pandas<1.5.0,>=0.24.2->ibm-watson-machine-learning) (2021.3)
Requirement already satisfied: numpy>=1.17.3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from pandas<1.5.0,>=0.24.2->ibm-watson-machine-learning) (1.20.3)
Requirement already satisfied: six>=1.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from python-dateutil<3.0.0,>=2.1->ibm-cos-sdk-core==2.11.0->ibm-cos-sdk==2.11.*->ibm-watson-machine-learning) (1.15.0)
Requirement already satisfied: charset-normalizer~=2.0.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from requests->ibm-watson-machine-learning) (2.0.4)
Requirement already satisfied: idna<4,>=2.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from requests->ibm-watson-machine-learning) (3.3)
Requirement already satisfied: zipp>=0.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from importlib-metadata->ibm-watson-machine-learning) (3.6.0)
Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from packaging->ibm-watson-machine-learning) (3.0.4)
Installing collected packages: ibm-watson-machine-learning
  Attempting uninstall: ibm-watson-machine-learning
    Found existing installation: ibm-watson-machine-learning 1.0.255
    Uninstalling ibm-watson-machine-learning-1.0.255:
      Successfully uninstalled ibm-watson-machine-learning-1.0.255
Successfully installed ibm-watson-machine-learning-1.0.256
Note: you may need to restart the kernel to use updated packages.
```

In [31]:

```
from ibm_watson_machine_learning import APIClient
import json
```

In [32]:

```
uml_credentials = {
    "url": "https://us-south.ml.cloud.ibm.com",
    "apikey": "poJ22ua6BCG9qY33B8fkgnz1bnP1f9DZqUlF9NkBM1bZ"
}
 client = APIClient(uml_credentials)
```

In [33]:

```
def guid_from_space_name(client, space_name):
    space = client.spaces.get_details()
    idr = []
    for i in space['resources']:
        idr.append(i['metadata']['id'])
    return idr
```

In [34]:

```
space_uid = guid_from_space_name(client, "university")
print(space_uid[0])
4f0253e5-f162-4eec-84ba-72e01fb69ab9
```

In [35]:

```
client.set.default_space(space_uid[0])
```

Out[35]:

```
'SUCCESS'
```

In [36]:

```
client.software_specifications.list()
```

```
-------------------------------  ------------------------------------  -----
NAME                             ASSET_ID                              TYPE
default_py3.6                    0062b8c9-8b7d-44a0-a9b9-46c416adcbd9 base
kernel-spark3.2-scala2.12        020d69ce-7ac1-5e68-ac1a-31189867356a base
pytorch-onnx_1.3-py3.7-edt       069ea134-3346-5748-b513-49120e15d288 base
scikit-learn_0.20-py3.6          09c5a1d0-9c1e-4473-a344-eb7b665ff687 base
spark-mllib_3.0-scala_2.12       09f4cff0-90a7-5899-b9ed-1ef348aebdee base
pytorch-onnx_rt22.1-py3.9        0b848dd4-e681-5599-be41-b5f6fccc6471 base
ai-function_0.1-py3.6            0cdb0f1e-5376-4f4d-92dd-da3b69aa9bda base
shiny-r3.6                       0e6e79df-875e-4f24-8ae9-62dcc2148306  base
tensorflow_2.4-py3.7-horovod  1092590a-307d-563d-9b62-4eb7d64b3f22  base
pytorch_1.1-py3.6                10ac12d6-6b30-4ccd-8392-3e922c096a92 base
tensorflow_1.15-py3.6-ddl        111e41b3-de2d-5422-a4d6-bf776828c4b7 base
runtime-22.1-py3.9               12b83a17-24d8-5082-900f-0ab31fbfd3cb base
scikit-learn_0.22-py3.6          154010fa-5b3b-4ac1-82af-4d5ee5abbc85 base
default_r3.6                     1b70aec3-ab34-4b87-8aa0-a4a3c8296a36  base
pytorch-onnx_1.3-py3.6           1bc6029a-cc97-56da-b8e0-39c3880dbbe7 base
kernel-spark3.3-r3.6             1c9e5454-f216-59dd-a20e-474a5cdf5988 base
pytorch-onnx_rt22.1-py3.9-edt 1d362186-7ad5-5b59-8b6c-9d0880bde37f base
tensorflow_2.1-py3.6             1eb25b84-d6ed-5dde-b6a5-3fbdf1665666 base
spark-mllib_3.2                  20047f72-0a98-58c7-9ff5-a77b012eb8f5 base
tensorflow_2.4-py3.8-horovod 217c16f6-178f-56bf-824a-b19f20564c49 base
runtime-22.1-py3.9-cuda          26215f05-08c3-5a41-a1b0-da66306ce658 base
do_py3.8                         295addb5-9ef9-547e-9bf4-92ae3563e720  base
autoai-ts_3.8-py3.8              2aa0c932-798f-5ae9-abd6-15e0c2402fb5 base
tensorflow_1.15-py3.6            2b73a275-7cbf-420b-a912-eae7f436e0bc base
```

```
kernel-spark3.3-py3.9          2b7961e2-e3b1-5a8c-a491-482c8368839a base
pytorch_1.2-py3.6              2c8ef57d-2687-4b7d-acce-01f94976dac1 base
spark-mllib_2.3                2e51f700-bca0-4b0d-88dc-5c6791338875 base
pytorch-onnx_1.1-py3.6-edt     32983cea-3f32-4400-8965-dde874a8d67e base
spark-mllib_3.0-py37           36507ebe-8770-55ba-ab2a-eafe787600e9 base
spark-mllib_2.4                390d21f8-e58b-4fac-9c55-d7ceda621326 base
xgboost_0.82-py3.6             39e31acd-5f30-41dc-ae44-60233c80306e base
pytorch-onnx_1.2-py3.6-edt     40589d0e-7019-4e28-8daa-fb03b6f4fe12 base
default_r36py38                41c247d3-45f8-5a71-b065-8580229facf0 base
autoai-ts_rt22.1-py3.9         4269d26e-07ba-5d40-8f66-2d495b0c71f7 base
autoai-obm_3.0                 42b92e18-d9ab-567f-988a-4240ba1ed5f7 base
pmml-3.0_4.3                   493bcb95-16f1-5bc5-bee8-81b8af80e9c7 base
spark-mllib_2.4-r_3.6          49403dff-92e9-4c87-a3d7-a42d0021c095 base
xgboost_0.90-py3.6             4ff8d6c2-1343-4c18-85e1-689c965304d3 base
pytorch-onnx_1.1-py3.6         50f95b2a-bc16-43bb-bc94-b0bed208c60b base
autoai-ts_3.9-py3.8            52c57136-80fa-572e-8728-a5e7cbb42cde base
spark-mllib_2.4-scala_2.11     55a70f99-7320-4be5-9fb9-9edb5a443af5 base
spark-mllib_3.0                5c1b0ca2-4977-5c2e-9439-ffd44ea8ffe9 base
autoai-obm_2.0                 5c2e37fa-80b8-5e77-840f-d912469614ee base
spss-modeler_18.1              5c3cad7e-507f-4b2a-a9a3-ab53a21dee8b base
cuda-py3.8                     5d3232bf-c86b-5df4-a2cd-7bb870a1cd4e base
autoai-kb_3.1-py3.7            632d4b22-10aa-5180-88f0-f52dfb6444d7 base
pytorch-onnx_1.7-py3.8         634d3cdc-b562-5bf9-a2d4-ea90a478456b base
spark-mllib_2.3-r_3.6          6586b9e3-ccd6-4f92-900f-0f8cb2bd6f0c base
tensorflow_2.4-py3.7           65e171d7-72d1-55d9-8ebb-f813d620c9bb base
spss-modeler_18.2              687eddc9-028a-4117-b9dd-e57b36f1efa5  base
-----------------------------  ------------------------------------  ----
Note: Only first 50 records were displayed. To display more use 'limit' parameter.
```

In [37]:

```
import sklearn
sklearn.__version___
```

Out[37]:

```
'1.0.2'
```

In [38]:

```
MODEL_NAME = 'university'
DEPLOYMENT_NAME = 'uni'
DEMO_MODEL = lr
```

In [39]:

```
software_spec_uid = client.software_specifications.get_id_by_name('runtime-22.1-py3.9')
```

In [40]:

```
model_props = {
    client.repository.ModelMetaNames.NAME: MODEL_NAME,
    client.repository.ModelMetaNames.TYPE: 'scikit-learn_1.0 ',
    client.repository.ModelMetaNames.SOFTWARE_SPEC_UID: software_spec_uid
}
```

In [41]:

```
model_details = client.repository.store_model(
    model = DEMO_MODEL,
    meta_props = model_props,
    training_data = X_train,
    training_target = y_train
)
model_details
```

Out[41]:

```
{'entity': {'hybrid_pipeline_software_specs': [],
  'label_column': 'Chance of Admit ',
  'schemas': {'input': [{'fields': [{'name': 'GRE Score', 'type': 'int64'},
      {'name': 'TOEFL Score', 'type': 'int64'},
      {'name': 'University Rating', 'type': 'int64'},
      {'name': 'SOP', 'type': 'float64'},
      {'name': 'LOR ', 'type': 'float64'},
      {'name': 'CGPA', 'type': 'float64'},
      {'name': 'Research', 'type': 'int64'}],
     'id': '1',
     'type': 'struct'}],
   'output': []},
  'software_spec': {'id': '12b83a17-24d8-5082-900f-0ab31fbfd3cb',
   'name': 'runtime-22.1-py3.9'},
  'type': 'scikit-learn_1.0'},
 'metadata': {'created_at': '2022-11-03T05:20:49.371Z',
  'id': '566cfcae-49ab-4bd3-b5df-abc981fa27b9',
  'modified_at': '2022-11-03T05:20:51.730Z',
  'name': 'university',
  'owner': 'IBMid-6630041JHH',
  'resource_key': 'a61934d2-41d0-413d-9f54-49589e7c7741',
 'space_id': '4f0253e5-f162-4eec-84ba-72e01fb69ab9'},
 'system': {'warnings': []}}
```

In [42]:

```
model_id = client.repository.get_model_id(model_details)
model_id
```

Out[42]:

```
'566cfcae-49ab-4bd3-b5df-abc981fa27b9'
```

In [43]:

```
deployment_props = {
    client.deployments.ConfigurationMetaNames.NAME:DEPLOYMENT_NAME,
    client.deployments.ConfigurationMetaNames.ONLINE: {}
}

deployment = client.deployments.create(
     artifact_uid = model_id,
     meta_props = deployment_props
)
```

Out [43]:

```
##############################################################################
#########

Synchronous deployment creation for uid: '566cfcae-49ab-4bd3-b5df-abc981fa27b9' started

##############################################################################
#########


initializing
Note: online_url is deprecated and will be removed in a future release. Use serving_urls instead.

ready


----------------------------------------------------------------------------------------------------
Successfully finished deployment creation, deployment_uid='28aea4f7-0bec-4310-82bf-
06e502d2cd4d'
----------------------------------------------------------------------------------------------------
```

HTML CODES

Uploading Html codes

Chance.html

```
{% extends 'index.html' %}

 {% block body %}

 <div class="container text-center p-4">

    <div class="d-flex justify-content-center">

         <div class="card" style="width: 34rem;">
```

```
      <img src="..\static\img\chance.png" class="card-img-top" alt="...">
      <div class="card-body">
        <h5 class="card-title">You Have Chance</h5>
        <p class="card-text">The model has predicted that you have chance</p>
        <a href="/home" class="btn btn-primary">Go Back</a>
      </div>
    </div>
  </div>
</div>
 {% endblock %}
```

Demo2.html

```
{% extends 'index.html' %}
{% block body %}
  <div class="p-4">
     <div class="row mb-3">
      <div class="col-4">
        <h2 class="text-responsive-h">
          Enter your details and get probability of your admission
        </h2>
        <p class="text-responsive">
          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 in a particular university. This
```

```
analysis should also help students who are currently preparing or will be preparing to get a better
idea.
        </p>
        <div class="d-flex justify-content-right">
          <img src="../static/img/anime.png" class="card-img-top" alt="..." />
        </div>
        </div>
      <div class="col-8">
        <div class="card p-2 ms-2 my-2">
          <div class="card-body">
            <h5 class="card-title pb-4">
              Enter the details
            </h5>
            <form action="/" method="post" id="theForm">
              <div class="row mb-3">
                <label for="gre" class="col-lg-2 col-form-label">GRE Score:</label>
                <div class="col-lg-10">
                  <input type="number" class="form-control" id="gre" name="gre"
min="250" max="340" required>
                </div>
              </div>
              <div class="row mb-3">
                <label for="tofel" class="col-lg-2 col-form-label">TOFEL Score:</label>
                <div class="col-lg-10">
                  <input type="number" class="form-control" id="tofel" name="tofel"
min="50" max="120" required>
                </div>
              </div>
              <div class="row mb-3">
                <label for="university_rating" class="col-lg-2 col-form-label">University
Rating:</label>
                <div class="col-lg-10">
                  <input type="number" class="form-control" id="university_rating"
step="0.01" name="university_rating" min="1" max="5" required>
                </div>
              </div>
              <div class="row mb-3">
                <label for="sop" class="col-lg-2 col-form-label">SOP:</label>
                <div class="col-lg-10">
                  <input type="number" class="form-control" id="sop" name="sop"
step="0.01" min="1" max="5" required>
                </div>
              </div>
              <div class="row mb-3">
                <label for="lor" class="col-lg-2 col-form-label">LOR:</label>
                <div class="col-lg-10">
                  <input type="number" class="form-control" id="lor" name="lor"
step="0.01" min="1" max="5" required>
                </div>
              </div>
              <div class="row mb-3">
                <label for="cgpa" class="col-lg-2 col-form-label">CGPA:</label>
                <div class="col-lg-10">
                  <input type="number" class="form-control" id="cgpa" name="cgpa"
step="0.01" min="5" max="10" required>
                </div>
              </div>
              <fieldset class="row mb-3">
                <legend class="col-form-label col-sm-2 pt-0">Research:</legend>
```

```
    <div class="col-sm-10">
        <div class="form-check">
            <input class="form-check-input" type="radio" name="yes_no_radio" id="gridRadios1" value="1">
            <label class="form-check-label" for="yes_no_radio">
            Yes
            </label>
        </div>
        <div class="form-check">
            <input class="form-check-input" type="radio" name="yes_no_radio" id="gridRadios2" value="0" checked>
            <label class="form-check-label" for="yes_no_radio">
            No
            </label>
        </div>
    </div>
</fieldset>
<div class="row lg-3">
    <div class="col-lg-2 mb-2 me-3">
        <button type="submit" class="btn btn-primary" id="button">Predict</button>
    </div>
    <div class="col-lg-2" id="spinner">
        <div class="spinner-border text-primary m-1" role="status">
            <span class="visually-hidden">Loading...</span>
        </div>
        <div class="spinner-grow text-primary m-1" role="status">
            <span class="visually-hidden">Loading...</span>
        </div>
```

```
                                </div>
                        </form>
                    </div>
                </div>
            </div>
        </div>
    </div>
{% endblock %}
```

Index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta name="viewport" content="width=device-width, initial-scale=1, maximum-scale=1, user-scalable=no">
    <link rel="stylesheet" type="text/css" rel="noopener" target="_blank" href="../static/css/styles.css">
    <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/et3URy9Bv1WTRi" crossorigin="anonymous">
    <script type="text/javascript" src="../static/js/script.js" async></script>
    <title>University Admit Eligibility Predictor</title>
</head>
```

```
<body>
    <nav class="navbar navbar-expand-lg bg-light">
        <div class="container-fluid">
            <a class="navbar-brand text-responsive-h" href="/">
                <img src="..\static\img\hat1.png" alt="Logo" width="30" height="24" class="d-inline-block align-text-top ">
                University Admission Eligibility Prediction System
            </a>
        </div>
    </nav>
    {% block body %}
    <h1> Index Page </h1>
    {% endblock %}
    <script src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/js/bootstrap.bundle.min.js" integrity="sha384-OERcA2EqjJCMA+/3y+gxIOqMEjwtxJY7qPCqsdltbNJuaOe923+mo//f6V8Qbsw3" crossorigin="anonymous"></script>
</body>
</html>
```

Nochance.html

```
{% extends 'index.html' %}
{% block body %}

<div class="container text-center p-4">
    <div class="d-flex justify-content-center">
        <div class="card" style="width: 34rem;">
            <img src="..\static\img\Nochance.jpg" class="card-img-top" alt="...">
            <div class="card-body">
                <h5 class="card-title">You have a LOW / NO chance</h5>
                <p class="card-text">The model has predicted that you  have no chance</p>
                <a href="/home" class="btn btn-primary">Go Back</a>
            </div>
        </div>
    </div>
</div>
{% endblock %}
```

Script.js

```
const button = document.getElementById('button');
const theForm = document.getElementById('theForm');
const loading = document.getElementById('spinner');

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"
}

theForm.onsubmit = disableButton;
 window.onload = enableButton;
```

Styles.css

```
* {
    margin: 0;
    padding: 0;
    border: 0;
}
body {
    font: 62.5%/1.5  "Lucida Grande", "Lucida Sans", Tahoma, Verdana, sans-serif;
    background: #e0eafc;
    background: -webkit-linear-gradient(to right, #e0eafc, #cfdef3);
    background: linear-gradient(to right, #e0eafc, #cfdef3);
    color: #000000;
    text-align:center;
}

h1 {
    font-size: 2.2em;
}
```

```
h2 {
    font-size: 2.0em;
}

h4 {
    font-size: 1.6em;
}

p {
    font-size: 1.2em;
}

input.text
  {
  padding: 3px;
  border: 1px solid #999999;
}

img {
    max-width: auto;
    height: auto;
}

.text-responsive {
    font-size: calc(50% + 0.6vw + 0.6vh);
}
```

```
.text-responsive-h {
    font-size: calc(80% + 0.6vw + 0.6vh);
}
```

Footer

REQUIRED IMAGES IN THE HTML CODES :

NO

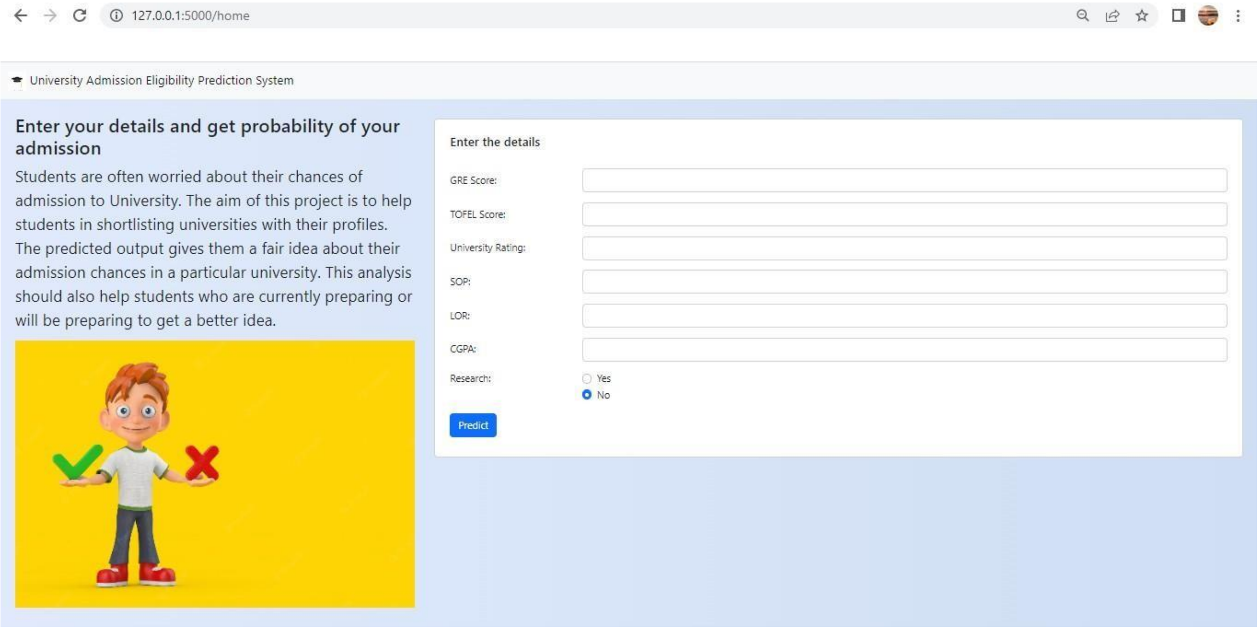
PYTHON CODE

App.py

```
from flask import Flask, render_template, redirect, url_for, request
import requests

app = Flask(__name__)

@app.route("/", methods = ['POST', 'GET'])
def index():
    if request.method == 'POST':
        arr = []
        for i in request.form:
            val = request.form[i]
            if val == '':
                return redirect(url_for("demo2"))
            arr.append(float(val))

        # deepcode ignore HardcodedNonCryptoSecret: <please specify a reason of ignoring this>
        API_KEY =  "poJ22ua6BCG9qY33B8fkgnz1bnP1f9DZqUlF9NkBM1bZ"
        token_response = requests.post('https://iam.cloud.ibm.com/identity/token', data={
            "apikey": API_KEY,
            "grant_type": 'urn:ibm:params:oauth:grant-type:apikey'
            })
        mltoken = token_response.json()["access_token"]
        header = {'Content-Type': 'application/json', 'Authorization': 'Bearer ' + mltoken}
        payload_scoring = {
            "input_data": [{"fields":[  'GRE Score',
                                        'TOEFL Score',
                                        'University Rating',
                                        'SOP',
                                        'LOR ',
                                        'CGPA',
                                        'Research'],
                            "values": [arr]
                            }]
                        }

        response_scoring = requests.post(
            'https://us-south.ml.cloud.ibm.com/ml/v4/deployments/28aea4f7-0bec-4310-82bf-06e502d2cd4d/predictions?version=2022-11-03',
            json=payload_scoring,
            headers=header
        ).json()

        result = response_scoring['predictions'][0]['values']

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

```
@app.route("/home")
def demo2():
    return render_template("demo2.html")

@app.route("/chance/<percent>")
def chance(percent):
    return render_template("chance.html", content=[percent])

@app.route("/nochance/<percent>")
def no_chance(percent):
    return render_template("noChance.html", content=[percent])

@app.route('/<path:path>')
def catch_all():
    return redirect(url_for("demo2"))

if__name__== "_main_":
    app.run()
```

OUTPUT IMAGES:



127.0.0.1:5000/home

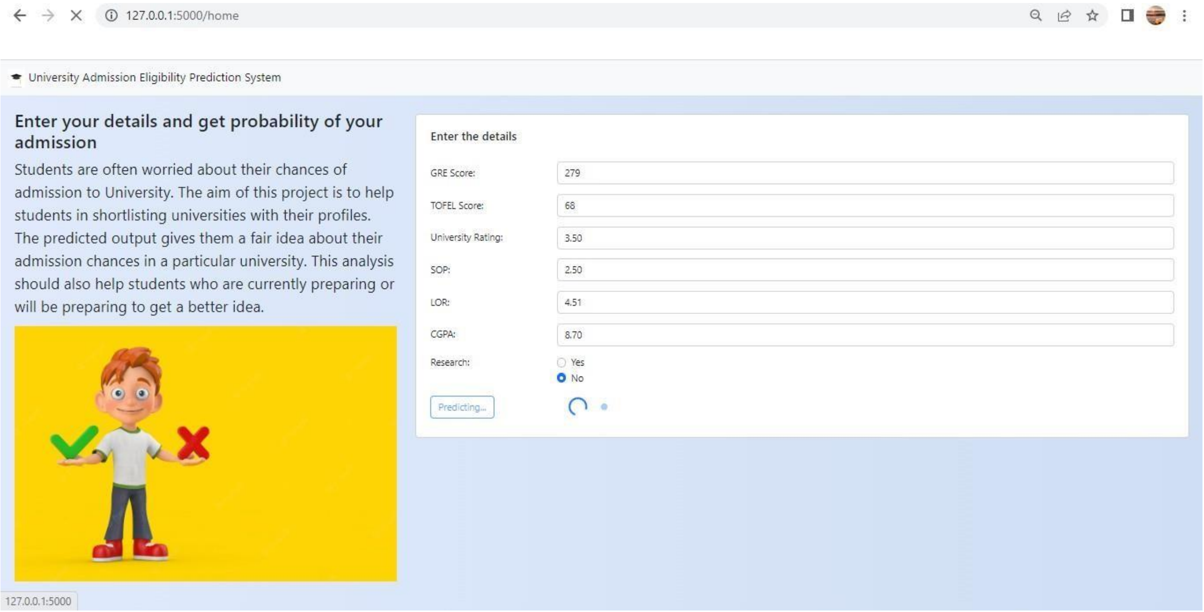
University Admission Eligibility Prediction System

Enter your details and get probability of your admission

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 in a particular university. This analysis should also help students who are currently preparing or will be preparing to get a better idea.

Enter the details

GRE Score:	
TOFEL Score:	
University Rating:	
SOP:	
LOR:	
CGPA:	
Research:	○ Yes ● No



127.0.0.1:5000/home

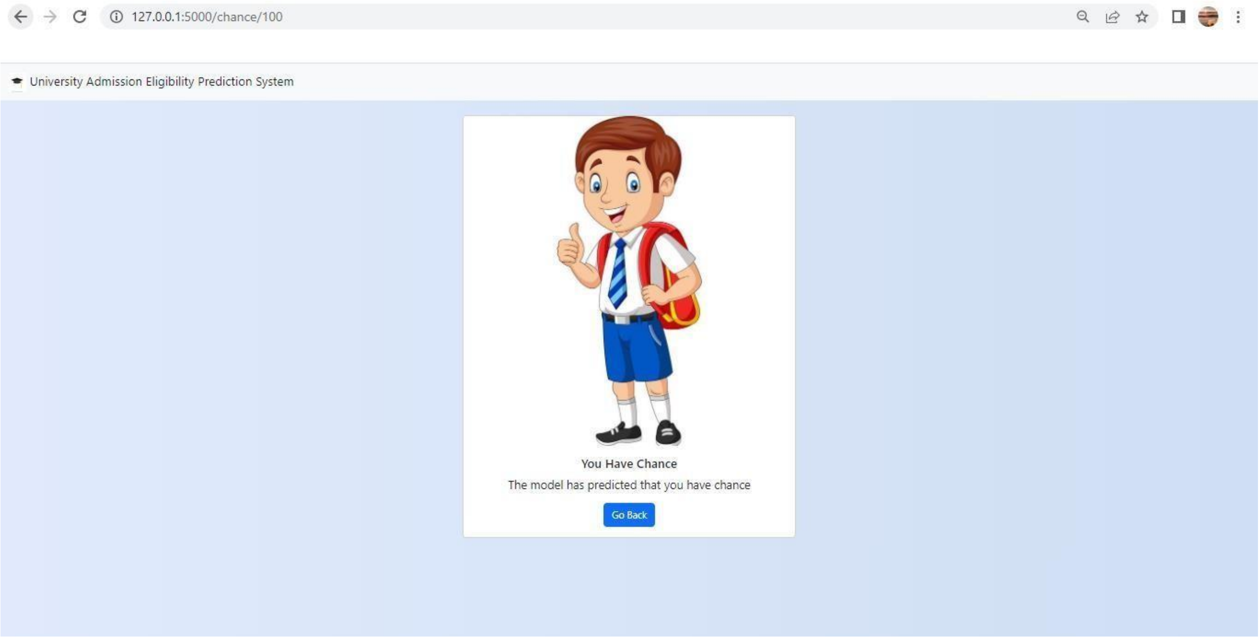
University Admission Eligibility Prediction System

Enter your details and get probability of your admission

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 in a particular university. This analysis should also help students who are currently preparing or will be preparing to get a better idea.

Enter the details

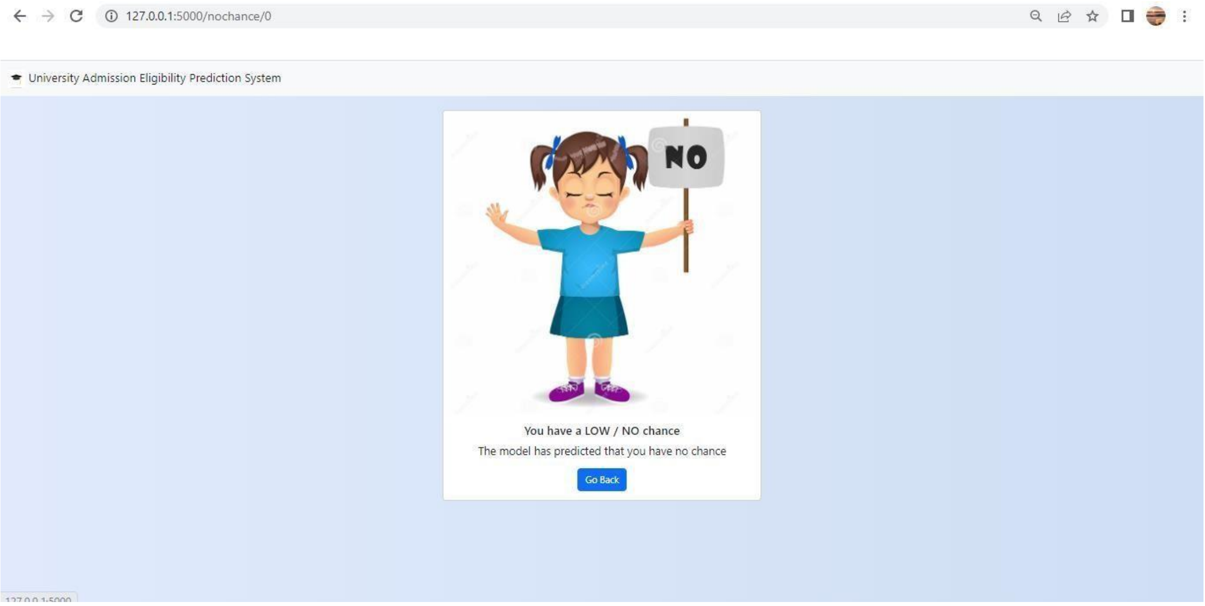
GRE Score:	279
TOFEL Score:	68
University Rating:	3.50
SOP:	2.50
LOR:	4.51
CGPA:	8.70
Research:	○ Yes ● No



University Admission Eligibility Prediction System

You Have Chance

The model has predicted that you have chance



University Admission Eligibility Prediction System

You have a LOW / NO chance

The model has predicted that you have no chance

12.2 GITHUB LINK:

https://github.com/IBM-EPBL/IBM-Project-9196-1658986187