Project Report Intelligent Admissions

1.INTRODUCTION

Abstract – College Admission Predictor System is a web based application system in which students can register their marks along with their personal information. This helps to predict their admissions in colleges.

1.1 Overview

The world business sectors are growing quickly and constantly searching generally advantageous information and experience among individuals. Youthful specialists who need to hang out in their positions are continually searching for Higher degrees that can help them in working on their abilities and information. Thus, the quantity of understudies applying for Graduate examinations has expanded in the last decade. One of the principle concerns is getting conceded to their fantasy University. It's seen that understudies actually decide to get their schooling from universities that are known Universally. What's more, with regards to international alumni, the United States of America is the primary inclination of most of them. With most incredibly famous universities, Wide assortment of courses accessible in each order, exceptionally authorize instruction and educating programs, understudy grants are accessible for international understudies .

• Graduate Record Exam1 (GRE) score. The score will be out of 340 focuses.

• Trial of English as a Foreigner Language (TOEFL) score, which will be out of 120 focuses

• University Rating (Uni.Rating) that demonstrates the Bachelor University positioning among different colleges. The score will be out of 5.

• Statement of direction (SOP) which is a record written to show the applicant's life, driven and the inspirations for the picked degree/college. The score will be out of 5 focuses.

• Letter of Recommendation Strength (LOR) which confirms the applicant proficient experience, fabricates validity, supports certainty and guarantees your ability. The score is out of 5 focuses.

- Undergraduate GPA (CGPA) out of 10.
- Research Experience that can uphold the application, like distributing research papers in gatherings, filling in as examination right hand with college teacher (either 0 or then again 1).

1.2 Purpose

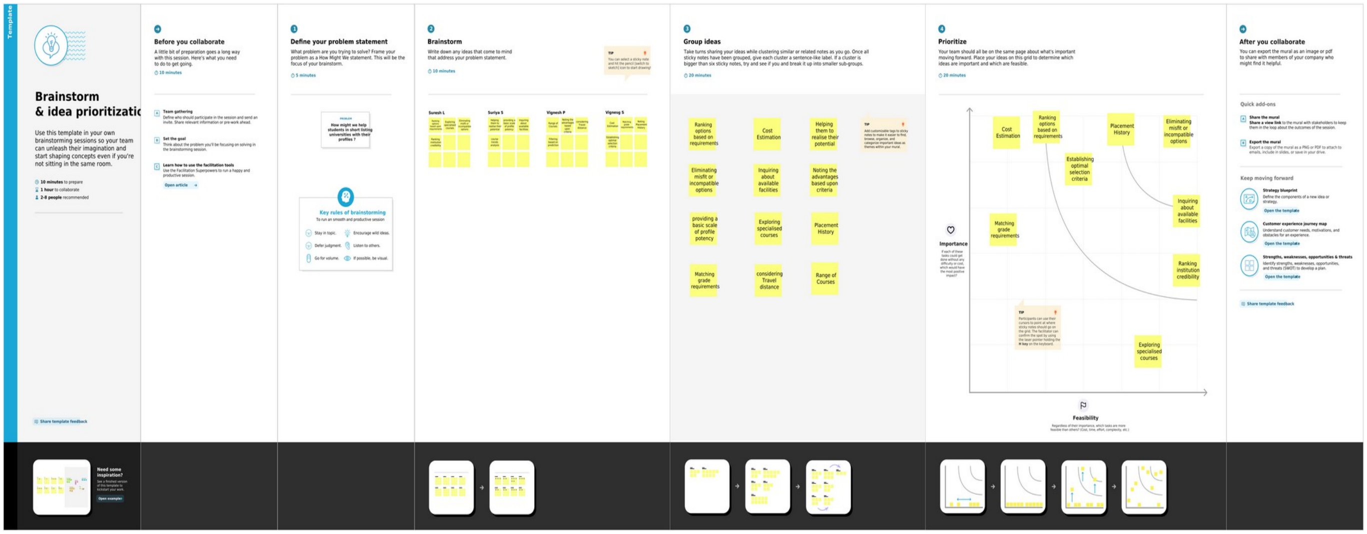
Decision intelligence has three key business benefits: First, it supports data-driven decisions by allowing the full spectrum of relevant data to be analyzed in real time. This enables companies to recognize patterns that would otherwise go undetected as well as potential anomalies that could impact outcomes.

The second major advantage is that decision intelligence empowers companies to reach decisions faster. This is mainly thanks to AI systems, which can process vast volumes of data at hitherto unthinkable speeds, significantly accelerating the entire decision-making process.

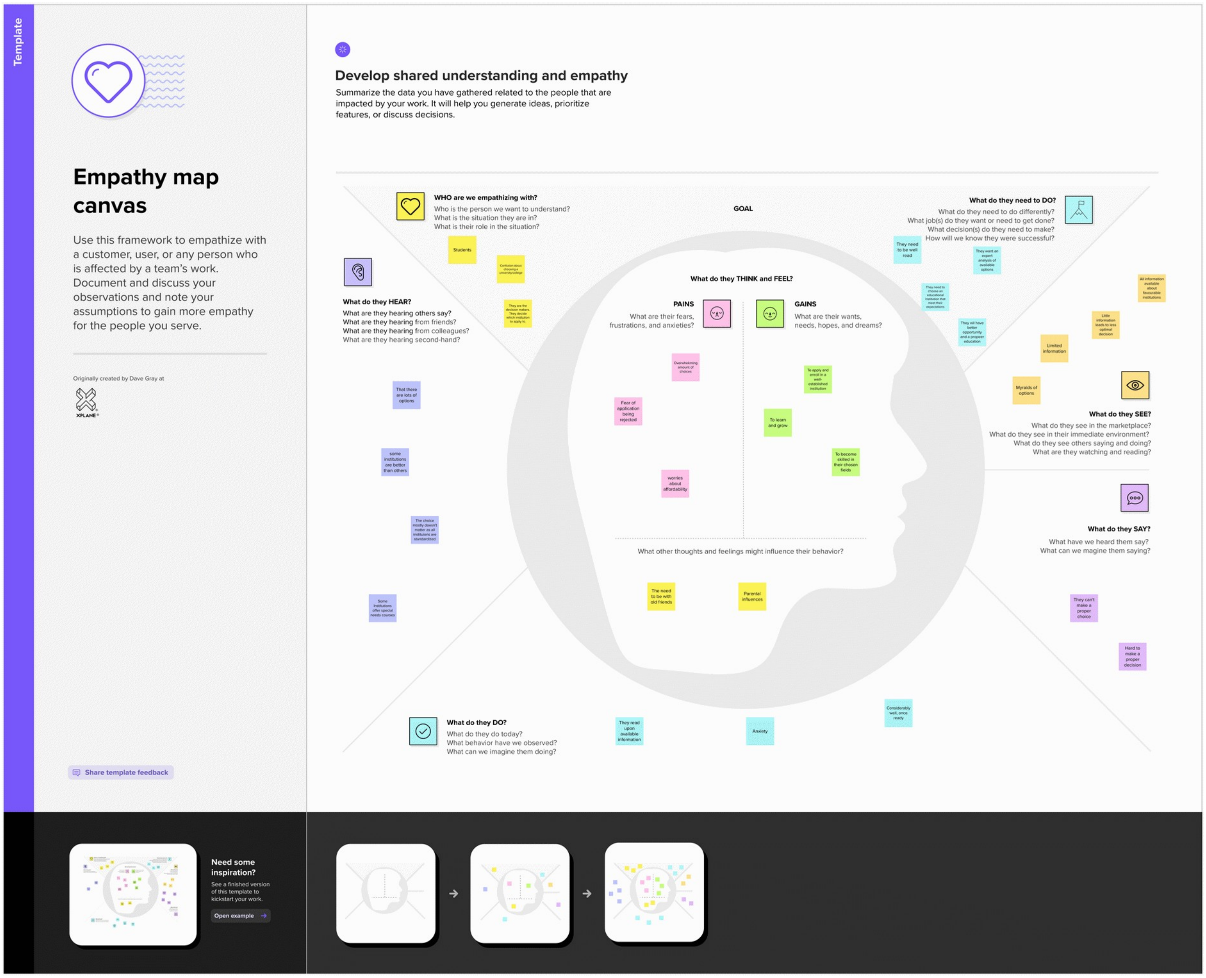
And last but not least, decision intelligence helps eliminate errors and prevent bias. It does this by basing decision on all the available data while avoiding bias by executing programmed algorithms – rather than relying on intrinsically fallible human judgment and gut feeling.

2.Problem Definition & Design Thinking

2.1 Ideation & Brainstorming Map


Brainstorm
& idea prioritizatic
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.
Before you collaborate
Define your problem statement
How might we help students in short listing universities with their profiles ?
Key rules of brainstorming
Brainstorm
Suresh L
Suriya S
Vignesh P
Vignesg S
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
Ranking options based on requirements
Cost Estimation
Helping them to realise their potential
Eliminating misfit or incompatible options
Inquiring about available facilities
Noting the advantages based upon criteria
providing a basic scale of profile potency
Exploring specialised courses
Placement History
Matching grade requirements
considering Travel distance
Range of Courses
TIP
Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.
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
Cost Estimation
Ranking options based on requirements
Placement History
Eliminating misfit or incompatible options
Establishing optimal selection criteria
Inquiring about available facilities
Matching grade requirements
Ranking institution credibility
Exploring specialised courses
Importance
If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?
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.
Feasibility
Regardless of their importance, which tasks are more feasible than others? (Cost, time, effort, complexity, etc.)
After you collaborate

2.2 Empathy Map



Empathy map canvas

Use this framework to empathize with a customer, user, or any person who is affected by a team's work. Document and discuss your observations and note your assumptions to gain more empathy for the people you serve.

Originally created by Dave Gray at

Develop shared understanding and empathy

Summarize the data you have gathered related to the people that are impacted by your work. It will help you generate ideas, prioritize features, or discuss decisions.

WHO are we empathizing with?
Who is the person we want to understand?
What is the situation they are in?
What is their role in the situation?

Students

Confusion about choosing a university/college

They are the decision makers. They decide which institution to apply to.

GOAL

What do they need to DO?
What do they need to do differently?
What job(s) do they want or need to get done?
What decision(s) do they need to make?
How will we know they were successful?

They need to be well read

They want an expert analysis of available options

They need to choose an educational institution that meet their expectations

They will have better opportunity and a propeer education

What do they HEAR?
What are they hearing others say?
What are they hearing from friends?
What are they hearing from colleagues?
What are they hearing second-hand?

That there are lots of options

some institutions are better than others

The choice mostly doesn't matter as all instituions are standardized

Some Institutions offer special needs courses

What do they THINK and FEEL?

PAINS
What are their fears, frustrations, and anxieties?

Overwhelming amount of choices

Fear of application being rejected

worries about affordability

GAINS
What are their wants, needs, hopes, and dreams?

To apply and enroll in a well-established institution

To learn and grow

To become skilled in their chosen fields

What other thoughts and feelings might influence their behavior?

The need to be with old friends

Parental influences

What do they SEE?
What do they see in the marketplace?
What do they see in their immediate environment?
What do they see others saying and doing?
What are they watching and reading?

All information available about favourable institutions

Little information leads to less optimal decision

Limited information

Myraids of options

What do they SAY?
What have we heard them say?
What can we magine them saying?

They can't make a proper choice

Hard to make a proper decision

What do they DO?
What do they do today?
What behavior have we observed?
What can we imagine them doing?

They read upon available information

Anxiety

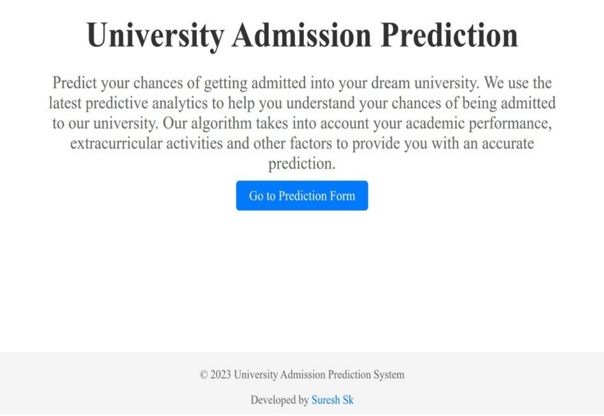
Considerably well, once ready

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

3.Result

As previously stated in the background section, several limitations occurred in the advising process at TU. These limitations can be grouped according to the descriptive or predictive level. In the following sections, we will present some of the contributions that we gain after applying the proposed approach according to these two levels. • Descriptive Analysis In the core of AA process, finding the factors that influence the students' final year GPA plays a vital role not only for the students but also for the presidential decisionmakers at the governmental (public) universities level because the increasing number of students who fail to succeed in their studies on the assigned time adds extra cost and resources. Analyzing the stored data, we found a relative positive correlation between the number of “equivalent contact hours” and students’ ages. Because of the educational regime followed at TU, the departments accept transferred students from other branches as well as from other universities. shows such a correlation. For this reason, we did more investigation to explore the reason behind this correlation. Correlation with GPA. Correlation between student age and amount of equivalent hours. shows the correlation between “student age” and number of “equivalent hours”. Even if this graph does not tell us more information. However, zooming on the age period between we noted that most of the equivalent hours fall in this interval. This can be explained by two reasons: The first reason is the educational regulations followed at Saudi universities that allow students to transfer from other branches or universities. So, when the students find themselves near to fail or hear that the study in other universities is easier than the study in their current university, they -especially fresh and junior students- might want to transfer. The second finding is related to the Deanship of Admission and Registration that tries to count such hours as soon as they can. However, in some cases are delayed and the students start their study even if the equivalence process does not finish yet. In addition to the earlier findings, the head of departments, as well as the deans of colleges, might want to give a general overview of the performance of students. Hence, our tool provides them with such a requirement. presents how is the distribution of students’ grades over the years.

Home page



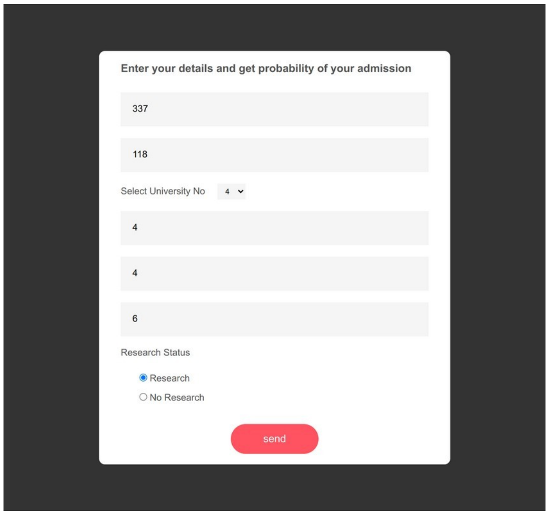
University Admission Prediction

Predict your chances of getting admitted into your dream university. We use the latest predictive analytics to help you understand your chances of being admitted to our university. Our algorithm takes into account your academic performance, extracurricular activities and other factors to provide you with an accurate prediction.

© 2023 University Admission Prediction System

Developed by Suresh Sk

Prediction form page



Enter your details and get probability of your admission

337

118

Select University No 4

4

4

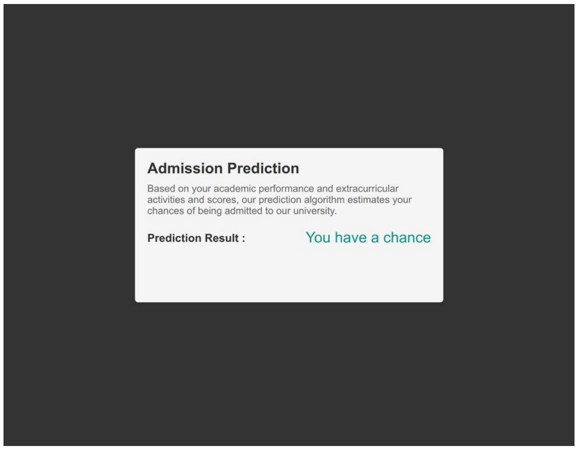
6

Research Status

● Research

○ No Research

Result page



Admission Prediction

Based on your academic performance and extracurricular activities and scores, our prediction algorithm estimates your chances of being admitted to our university.

Prediction Result : You have a chance

4.ADVANTAGES &DISADVANTAGES

Advantages of Online Admission:-

- **Applicants' Convenience –** One of the greatest advantages of the online application system is that applicants can choose to submit their applications at their convenience. All that is required is access to a computer and internet connectivity. Messy handwriting, lack of postal connectivity, delay in courier delivery etc. are unlikely to disrupt the application process. This is a great advantage to candidates in rural areas and candidates with disabilities.

- **Logistics –** No more running out of paper application forms, picking the right colour ink pens, illegible prints and wondering if the application has been received at all. The online application process offers university applicants a uniform platform for filling in their applications and also provides prompts on which fields are mandatory. The acknowledgement is almost immediate and the system user-friendly.

- **Advantage to Universities –**Universities and educational institutions are also at a major advantage when it comes to an online admission process. Quick access to student records and databases, efficient systems for filtering out candidates and processing of applications is possible through the online application process. The costs of processing applications and employing additional manpower during admissions are slashed with the implementation of an online application system.
- **Increases Accuracy and Efficiency –** Those who have seen university officials accepting thousands of paper applications each day at office counters understand that high fatigue and monotony involved in the paperwork is a catalyst for errors. Each error could cost students their academic career and educational prospects. The online admission system is highly reliable and efficient and eliminates chances of such errors.
- **Demolishing Geography –** Another great advantage of the online admission system is that it makes it possible for candidates from across the country and even abroad to apply to Indian universities without any hassles. It eliminates the inconveniences caused by ailments and exigencies, providing deserving candidates a convenience that has never before been available.

Disadvantages of Online Admission:-

- **Computer Literacy and Internet Access –** In India, though Internet penetration is rather high, Internet connectivity and speed issues are major impediments to bring any real advantage to university applicants. Most rural areas experience high blackouts and electricity issues. This means, once again candidates in urban districts and areas are placed at a significant advantage.

- **Low Computer Literacy –** Another major concern is the low rate of computer literacy in India. Current estimates say that only about 6.5 percent Indians are computer savvy. A sudden shift to the online admission process is likely to cause confusion and despondency among a great many applicants.
- **Security Concerns –** In a country like India where security fails of online systems have become increasingly common over the years, online applications make it easier for systems to be breached and for applications or scores to be manipulated. The fear that hackers may target universities and educational institutions is a grave one. Unintentional system failures or server crashes may disrupt the entire admission process of universities and educational institutions. Another important concern is the confidentiality of student information and associated security risks involved in online application processing.
- **Authenticity –** In most manual admission processes, the eligibility of candidates is proved by verification of originals at the time of accepting applications, ensuring that only genuine candidates apply. Online applications make it easier for fraudsters to manipulate the application process and eligibility requirements.
- **Infrastructural Requirements –** Building a robust and secure online admission process is a task that requires financial and infrastructural resources. Many universities and educational institutions may not have the necessary resources and all these costs will ultimately be borne by the students. In a country where higher education is a luxury few can afford, increased costs may be a deterrent for education.

5.APPLICATIONS

Data Collection:

The way toward get-together information relies upon the sort of undertaking, for a ML project, real time information is utilized. The informational index can be gathered from different sources like a document, data set, sensor and different sources and some free informational collections from web can be utilized. Kaggle and UCI Machinelearning Repository are the storehouses that are utilized the most for information assortment for Machine learning models. Kaggle is quite possibly the most visited sites that is utilized for gathering informational collections [2,3].

Pre-processing:

Information pre-processing is a cycle of cleaning the raw information i.e. the information is gathered in reality and is changed over to a perfect dataset. There are certain steps executed to change over the data into a little clean data collection and make it practical for examination, this piece of the interaction is called as information pre-processing.

The greater part of this present reality information is chaotic, as:

- Missing Data
- Noisy Data
- Inconsistent Data

A portion of the essential pre-handling strategies that can be utilized to change over crude data are:

- Conversion of Data
- Ignoring the missing qualities
- Filling the missing qualities
- Detection of exceptions
- Feature Extraction

At the point when the data to an algorithm is too enormous to ever be processed and it is suspected to be repetitive then it very well may be changed into a diminished arrangement of highlights. Deciding a subset of the initial features is called feature selection. The selected features are required to contain the significant data from the data, with the goal that the ideal assignment can be performed by utilizing this reduced representation rather than the total beginning data. Feature extraction includes reducing the number of assets needed to describe an enormous arrangement of information. When performing investigation of complex information one of the serious issues comes from the quantity of factors included. Examination with an enormous number of factors for the most part requires a lot of memory and calculation power, likewise it's anything but a grouping calculation to overfit to preparing tests and sum up inadequately to new examples. Highlight extraction is an overall term for techniques for developing blends of the factors to get around these issues while as yet portraying the information with adequate exactness. Many AI experts accept that appropriately improved element extraction is the way to successful model development [4,5].

Model Selection:

Model determination is the way toward choosing one last AI model from among an assortment of applicant AI models for a training dataset. Model selection is a cycle that can be applied both across various kinds of models and across models of a similar sort arranged with various model hyper parameters.

Train and Test Data:

For training a model we at first split the model into 2 segments which are 'training data' and 'Testing data'. The classifier is training utilizing 'training data set', and afterward tests the performance of classifier on inconspicuous 'test data set'.

Training set:

The training set is the material through which the computer learns out how to deal with data. AI utilizes calculations to perform the training part. Training data set is utilized for learning and to fit the parameters of the classifier.

Test set:

A set of unseen data utilized uniquely to evaluate the performance of a completely indicated classifier.

Evaluation Model:

Assessment is an integral of the model development process. It assists with tracking down the best model that addresses the information and how well the picked model will function later on. To work on the model hyper- boundaries of the model can be tuned and the exactness can be improved. Confusion matrix can be utilized to improve by expanding the quantity of genuine positives and genuine negatives. The output is predicted by investigating the test information as contribution alongside test information output and then the output is shown [6,7,8].

Interface:

A web interface is built to take input and display an output. Flask language is used to build a web interface and pickle library is used to integrate both model and web page.

Data Visualization:

Data visualization is the representation of data in a graph, chart, or other visual format.

6.CONCLUSION

The primary objective of this work is to make a Machine Learning model which could be utilized by understudies who need to seek after their Education. Many AI algorithms were used for this examination. Linear Regression model contrasted with different models gives the best outcome. Understudies can utilize the model to survey their shots at getting induction into a specific University with a normal exactness of 82%. An ultimate objective of examination will be cultivated effectively, as the framework permits understudies to save the parcel of time and cash that they would spend on instructive guides and application charges for schools where they have less shots at getting affirmations. In future this module of expectation can be incorporated with module of robotized handling framework and different models like neural organization. Likewise, segregate investigation can be utilized independently or joined for upgrading dependability and precision forecast. At long last, understudies can have an open-source AI model which will assist the understudies with knowing their opportunity of entrance into a specific college with high exactness.

7.FUTURE SCOPE

From the proposed work we are able to identify only chance to get seat and we are not able to identify which university we are obtaining. So, in future we can develop a representation, which gives us a list of universities in which we can obtain admission.

8.Appendix

Importing the libraries

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.preprocessing import MinMaxScaler
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
import pickle

# Read the data
data = pd.read_csv('./Admission_Predict.csv')

# To find the shape of our data, the data.shape() method is used.
data.shape

#  To find the data type, data.info() function is used.
data.info()

# For checking the null values, data.isnull() function is used.
data.isnull().any()

# Remove the Serial no colum in data
data = data.drop(['Serial No.'], axis=1)

# Let us rename the column, in python have a inbuilt function rename( ).We
can easily rename the column names.
data = data.rename(columns={'Chance of Admit ' : 'Chance of Admit'})
data = data.rename(columns={'LOR ' : 'LOR'})

#  we can find mean, std, min, max and percentile values of continuous
features.
data.describe()

"""Visual analysis"""

# : Univariate analysis
sns.displot(data['GRE Score'])
```

```
"""From the correlation matrix heatmap, it seems like all of the variables are all
positively correlated to the chances of admission with CGPA, GRE score and
TOEFL score being the highest correlated variable to chances of admission"""

corr = data.corr()
#plot correlation matrix heatmap
hm = sns.heatmap(data = corr, annot = True, cmap = sns.color_palette("flare",
as_cmap=True))

# Pair Plot: Plot pairwise relationships in a dataset
sns.pairplot(data=data,hue='Research',markers=['^','v'],palette='inferno')

# A scatter plot is a type of plot that shows the data as a collection of points
sns.scatterplot(x='University Rating',y='CGPA',data=data,color='Red',s=100)

# Visualizing the Each column in a dataset using subplot( ).

category = ['GRE Score','TOEFL Score','University
Rating','SOP','LOR','CGPA','Research','Chance of Admit']
color = ['yellowgreen','gold','lightskyblue','pink','red','purple','orange','gray']

start = True

for i in np.arange(4):
  fig = plt.figure(figsize=(14,8))
  plt.subplot2grid((4,2),(i,0))
  data[category[2*i]].hist(color=color[2*i],bins=10)
  plt.title(category[2*i])
  plt.subplot2grid((4,2),(i,1))
  data[category[2*i+1]].hist(color=color[2*i+1],bins=10)
  plt.title(category[2*i+1])

plt.subplots_adjust(hspace=0.7,wspace=0.2)
plt.show()

"""Scaling the data"""

sc = MinMaxScaler()

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

x = sc.fit_transform(x)
```

```
x_train, x_test, y_train, y_test =
train_test_split(x,y,test_size=0.20,random_state=101)

y_train=(y_train > 0.5)
# y_train

y_test=(y_test > 0.5)
# y_test


"""Model building"""

cls = LogisticRegression(random_state=0)

lr = cls.fit(x_train,y_train)

y_pred = lr.predict(x_test)
y_pred

"""# save the model to disk"""

Pkl_Filename = "university.pkl"

with open(Pkl_Filename, 'wb') as file:
    pickle.dump(lr, file)

# Load the Model back from file
with open(Pkl_Filename, 'rb') as file:
    Pickled_LR_Model = pickle.load(file)

Pickled_LR_Model

y_predict =  Pickled_LR_Model.predict(x_test)

y_predict

"""**Result**"""

min = [290.0,92.0,1.0,1.0,1.0,6.8,0.0]
max = [340.0,120.0,5.0,5.0,5.0,9.92,1.0]

# userData = [337,118,4,4.5,4.5,9.65,1]  # This user have chance
# userData = [220,50,2,1,3,8,0]  # This user don't have chance
userData = [290,92,2,1,3,6,0]  # This user don't have chance
```

```
k = [float(x) for x in userData]
p = []

for i in range(7):
  l = (k[i]-min[i]) / (max[i]-min[i])
  p.append(l)

prediction = Pickled_LR_Model.predict([p])
print(prediction)

output = prediction[0]

if(output == False):
  print("You don't have a chance")
else:
  print("You have a chance")

Data


"""ANN Model"""

import tensorflow as tf
from tensorflow import keras
from tensorflow.keras.layers import Dense, Activation, Dropout
from tensorflow.keras.optimizers import Adam

# Initialize the model
model = keras.Sequential()

# Add input layer
model.add(Dense(7,activation = 'relu',input_dim = 7))

# Add hidden layer
model.add(Dense(7,activation='relu'))

# Add output layer
model.add(Dense(1,activation='linear'))

model.summary()

model.compile(loss='binary_crossentropy',optimizer='adam',metrics=['accuracy'
])
```

```
model.fit(x_train,y_train,batch_size=20,epochs=100)

from sklearn.metrics import accuracy_score, classification_report, recall_score,
roc_auc_score, confusion_matrix

# Make a prediction a training model
train_predictions = model.predict(x_train)

print(train_predictions)

# Get the training accuracy
train_acc = model.evaluate(x_train,y_train,verbose=0)[1]
print(train_acc)

# Get the test accuracy
test_acc = model.evaluate(x_test,y_test,verbose=0)[1]
print(test_acc)

pred = model.predict(x_test)
pred = (pred>0.5)
Pred


"""Compare the model"""

print("\nAccuracy_score : %f" %(accuracy_score(y_test,y_pred) * 100))
print("Recall_score : %f" %(recall_score(y_test,y_pred) * 100))
print("ROC score : %f\n" %(roc_auc_score(y_test,y_pred) * 100))
print(confusion_matrix(y_test,y_pred))

"""Tarining and testing accuracy"""

print(classification_report(y_test,pred))

"""Save the model"""

# Save the model in HDF5 format
model.save('model.h5')

"""**Result**"""
from tensorflow.keras.models import load_model

model = load_model("./model.h5")
```

```
min = [290.0,92.0,1.0,1.0,1.0,6.8,0.0]
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output = prediction[0]

if(output == False):
  print("You don't have a chance")
else:
  print("You have a chance")
```

Model Deployment

Save the best model

```
Pkl_Filename = "university.pkl"
with open(Pkl_Filename, 'wb') as file:
    pickle.dump(lr, file)
```

Integrate with Web Framework

Build python code

```
import numpy as np

from flask import Flask, request, jsonify, render_template

import pickle

app = Flask(__name__)

pickle.load(open('./university.pkl','rb'))
```

```
@app.route('/',methods=['GET'])
def index():
    return render_template('home.html')

@app.route('/predictionForm',methods=['GET'])
def predictionForm():
    return render_template('form.html')



@app.route('/result',methods=['POST'])
def result():


    # userData = [337,118,4,4.5,4.5,9.65,1]  # This values have chance
    # userData = [220,50,2,1,3,8,0]  # This values don't have chance

    min = [290.0, 92.0, 1.0, 1.0, 1.0, 6.8, 0.0]
    max = [340.0, 120.0, 5.0, 5.0, 5.0, 9.92, 1.0]

    k = [float(x) for x in request.form.values()]
    p = []

    for i in range(7):
        l = (k[i]-min[i]) / (max[i]-min[i])
        p.append(l)

    prediction = model.predict([p])
    # print(prediction)

    output = prediction[0]

    if(output == False):
        return render_template('result.html', prediction_text="You don't
have a chance")
    else:
        return render_template('result.html',prediction_text="You have a
chance")

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

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