A

Mini Project

On

PREDICTION OF ENGINEERING BRANCH SELECTION FOR INTER STUDENTS

(Submitted in partial fulfillment of the requirements for the award of Degree)

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE AND ENGINEERING

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2020-2024

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATE

This is to certify that the project entitled **"PREDICTION OF ENGINEERING BRANCH SELECTION FOR INTER STUDENTS"** being submitted by KADARI SAICHANDU(207R1A0520), KORUTLA MONICA(207R1A0532) and MAHADEV SRINATH GOUD (207R1A0539) in partial fulfillment of the requirements for the award of the degree of B.Tech in Computer Science and Engineering to the CMR Technical Campus, is a record of bonafide work carried out by them under our guidance and supervision during the year 2023- 2024.

The results embodied in this thesis have not been submitted to any other University or Institute for the award of any degree or diploma.

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EXTERNAL EXAMINER

Submitted for viva voice Examination held on _____

ACKNOWLEDGEMENT

Apart from the efforts of us, the success of any project depends largely on the encouragement and guidelines of many others. We take this opportunity to express our gratitude to the people who have been instrumental in the successful completion of this project.

We take this opportunity to express my profound gratitude and deep regard to my guide **A.Uday kiran,** Assistant Professor for his exemplary guidance, monitoring and constant encouragement throughout the project work.The blessing, help and guidance given by him shall carry us a long way in the journey of life on which we are about to embark.

We also take this opportunity to express a deep sense of gratitude to the Project Review Committee (PRC) **Dr. Punyaban Patel, Ms. Shilpa, Dr. M . Subha Mastan Rao & J. Narasimharao** for their cordial support, valuable information and guidance, which helped us in completing this task through various stages.

We are also thankful to **Dr. K. Srujan Raju,** Head, Department of Computer Science and Engineering for providing encouragement and support for completing this project successfully.

We are obliged to **Dr. A. Raji Reddy,** Director for being cooperative throughout the course of this project. We also express our sincere gratitude to Sri. **Ch. Gopal Reddy,** Chairman for providing excellent infrastructure and a nice atmosphere throughout the course of this project.

The guidance and support received from all the members of **CMR Technical Campus** who contributed to the completion of the project. We are grateful for their constant support and help.

Finally, we would like to take this opportunity to thank our family for their constant encouragement, without which this assignment would not be completed. We sincerely acknowledge and thank all those who gave support directly and indirectly in the completion of this project.

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ABSTRACT

Prediction of Engineering branch selection for inter students is the process of selecting a specific engineering branch after completing intermediate studies.Faculty or parents have neither the required knowledge nor experience.so this recommender system has been evolved to provide them guidance in selecting a right engineering branch.This prediction model can help students make informed decisions about their branch selection based on their interests, strengths, and weaknesses.This system recommend them suitable branch based on their score.K nearest neighbors is used to recommend branch and collaborative filtering is used to recommend colleges.

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1. INTRODUCTION

1.1 PROJECT SCOPE

A student by himself is not mature enough to take decision in his early life. Selecting the wrong courses means mismatch between student aptitude, capability and interest. Faculty or parents have neither the required knowledge nor experience. Since there is no other reliable source generally available that can guide the student towards the most suitable direction, so this recommended system has been evolved to provide him guidance in selecting a right engineering branch.

1.2 PROJECT PURPOSE

The prediction was based on a student's academic performance and interests, along with factors such as family background and financial constraints. However, with the advancements in data analytics and machine learning, it is now possible to make more accurate predictions using data- driven models. The use of predictive analytics can also help identify patterns and trends in student behaviour, which can be used to improve the educational system and provide better guidance to students

1.3 PROJECT FEATURES

The main purpose of these project is to guide the students and carry is them is selecting the bright future. The project will have the Machine learning which will be used to over the existing System Drawbacks. Project contains new machine learning techniques and these techniques will guide the students on choosing a Right path to explore their talent and show their skills and improves their portability.

2. SYSTEM ANALYSIS

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SYSTEM ANALYSIS

System Analysis is the important phase in the system development process. The System is studied to the minute details and analyzed. The system analyst plays an important role of an interrogator and dwells deep into the working of the present system. In analysis, a detailed study of these operations performed by the system and their relationships within and outside the system is done. A key question considered here is, "what must be done to solve the problem?" The system is viewed as a whole and the inputs to the system are identified. Once analysis is completed the analyst hasa firm understanding of what is to be done.

2.1 PROBLEM DEFINITION

The general statement of PREDICTION OF ENGINEERING BRANCH SELECTION FOR INTER STUDENTS is to predict the exact engineering branch of a particular student based on their score and their personal details in a fast and efficient way.

2.2 EXISTING SYSTEM

Due to improper Information about any college, student and parents get confused about admissions. Since there is no other reliable source generally available that can guide the student to enter into proper educational field. With growing number of students and number of choices and the amount of work on these advisors who are not able to handle the situation due to workload. Hence it is desirable to have some form of recommendation tools that need to be developed to help them in the process of admissions

2.2.1 LIMITATIONS OF EXISTING SYSTEM

Following are the disadvantages of existing system:

- Lack of human judgment
- Technical issues
- Cost and Maintenance

2.3 PROPOSED SYSTEM

The system will make recommendations based on the student's academic performance, interests, personality, and other relevant factors.The primary goal of the software is to provide guidance to students who may be uncertain about which engineering branch and college to choose.The system will use advanced algorithms and machine learning techniques to analyze the student's data and make recommendations based on the student's unique profile.The software will be designed allowing students to input their academic data and other relevant information easily.The system will take into account various factors that may influence a student's decision, such as the student's interest, academic performance, location, availability of scholarships, and other factors that are relevant to the student's decision- making process.

2.3.1 ADVANTAGES OF THE PROPOSED SYSTEM

- personalized recommendations
- time saving
- cost-effective
- faster feedback

2.4 FEASIBILITY STUDY

The feasibility of the project is analyzed in this phase and a business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. Three key considerations involved in the feasibility analysis:

- Economic Feasibility
- Technical Feasibility
- Social Feasibility

2.4.1 ECONOMIC FEASIBILITY

The developing system must be justified by cost and benefit. Criteria to ensure that effort is concentrated on a project, which will give best, return at the earliest. One of the factors, which affect the development of a new system, is the cost it would require.

The following are some of the important financial questions asked during preliminary investigation:

- The costs conduct a full system investment
- The costs of the hardware and software
- The benefits in the form of reduced costs or fewer costly errors

Since the system is developed as part of project work, there is no manual cost to spend for the proposed system. Also all the resources are already available, it give an indication that the system is economically possible for development.

2.4.2 TECHNICAL FEASIBILITY

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

2.4.3 SOCIAL FEASIBILITY

This includes the following questions:

Is there sufficient support for the users?

Will the proposed system cause harm?

The project would be beneficial because it satisfies the objectives when developed and installed. All behavioral aspects are considered carefully and conclude that the project is behaviorally feasible.

2.5 HARDWARE & SOFTWARE REQUIREMENTS

2.5.1 HARDWARE REQUIREMENTS:

Hardware interfaces specify the logical characteristics of each interface between the software product and the hardware components of the system. The following are some hardware requirements.

- Processor : Intel i3 (or) Higher
- Ram : 4 GB.
- Hard Disk : 40 GB

2.5.2 SOFTWARE REQUIREMENTS:

Software Requirements specifies the logical characteristics of each interface and software components of the system.

The following are some software requirements.

- Operating system : Windows8 or Above.
- Coding Language : python

3. ARCHITECTURE

3. ARCHITECTURE

3.1 PROJECT ARCHITECTURE

This project architecture shows the procedure how text is converted into code and speech is converted in to text

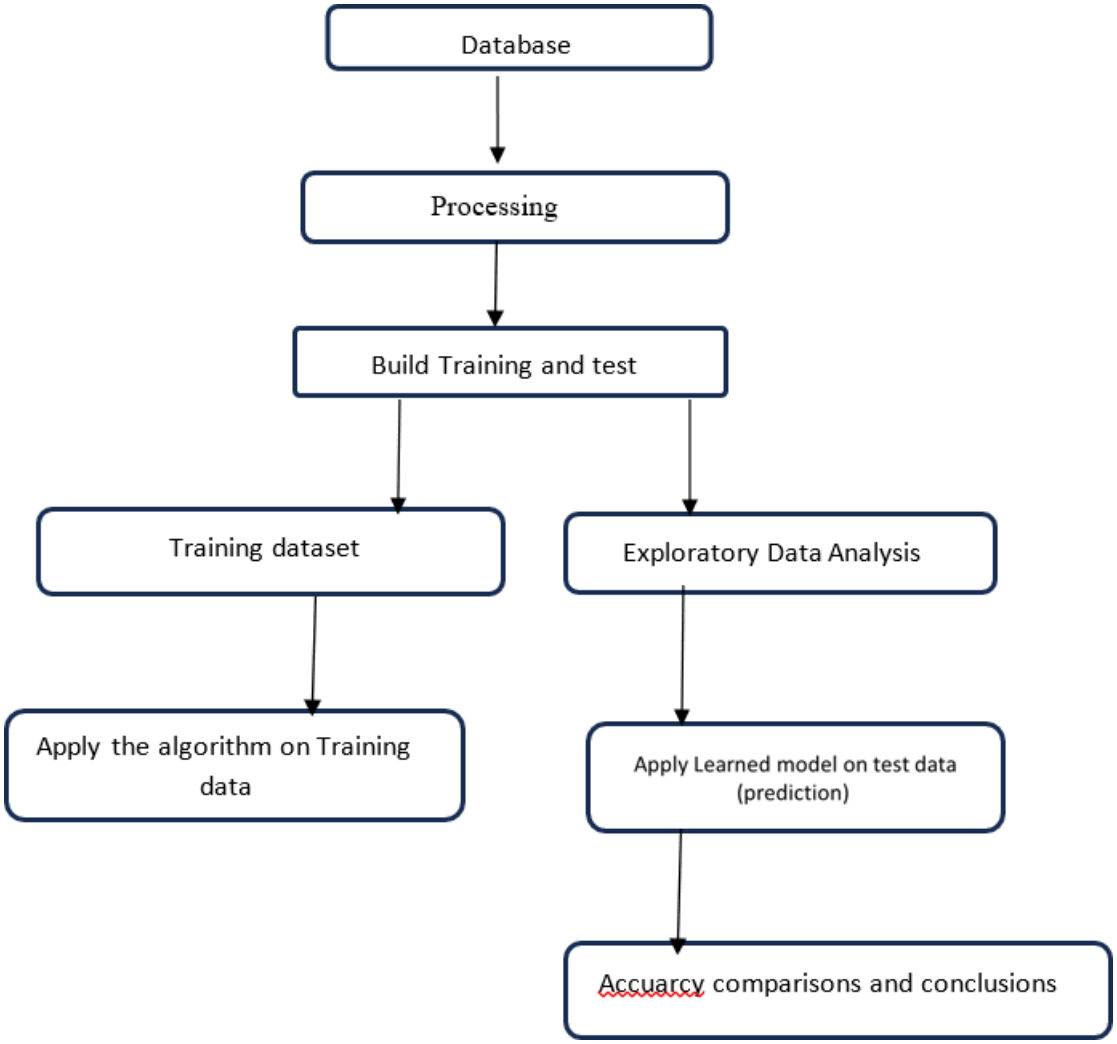


Figure 3.1: Architecture for prediction of engineering branch selection for Inter students

3.2 DESCRIPTION

In this we predict the engineering branches for the students who complete their intermediate and attended the entrance examinations.The colleges are predicted based on their eamcet ranks or scores they scored in intermediate .Data is collected from the students to predict the recommended college for the students.In this we use machine learning algorithms to predict the college dataset .Using the available college database students can able to select their preference new branch based on their remarks they obtained. It's important to note that students may change their preferences over time as they learn more about different engineering disciplines. Predicting their final choice accurately can be challenging, as it depends on a combination of internal factors, external influences, and individual growthTo create a predictive model, you can collect data on these factors, conduct surveys, and use statistical analysis or machine learning techniques to make predictions based on historical data. However, the accuracy of such predictions will vary, and students should ultimately have the freedom to explore their interests and make their own decisions when selecting an engineering branch.

3.3 USE CASE DIAGRAM

A use case diagram is a graphical depiction of a user's possible interactions with a system. A use case diagram shows various use cases and different types of users the system has. The use cases are represented by either circles or ellipses. The actors are often shown as stick figures.

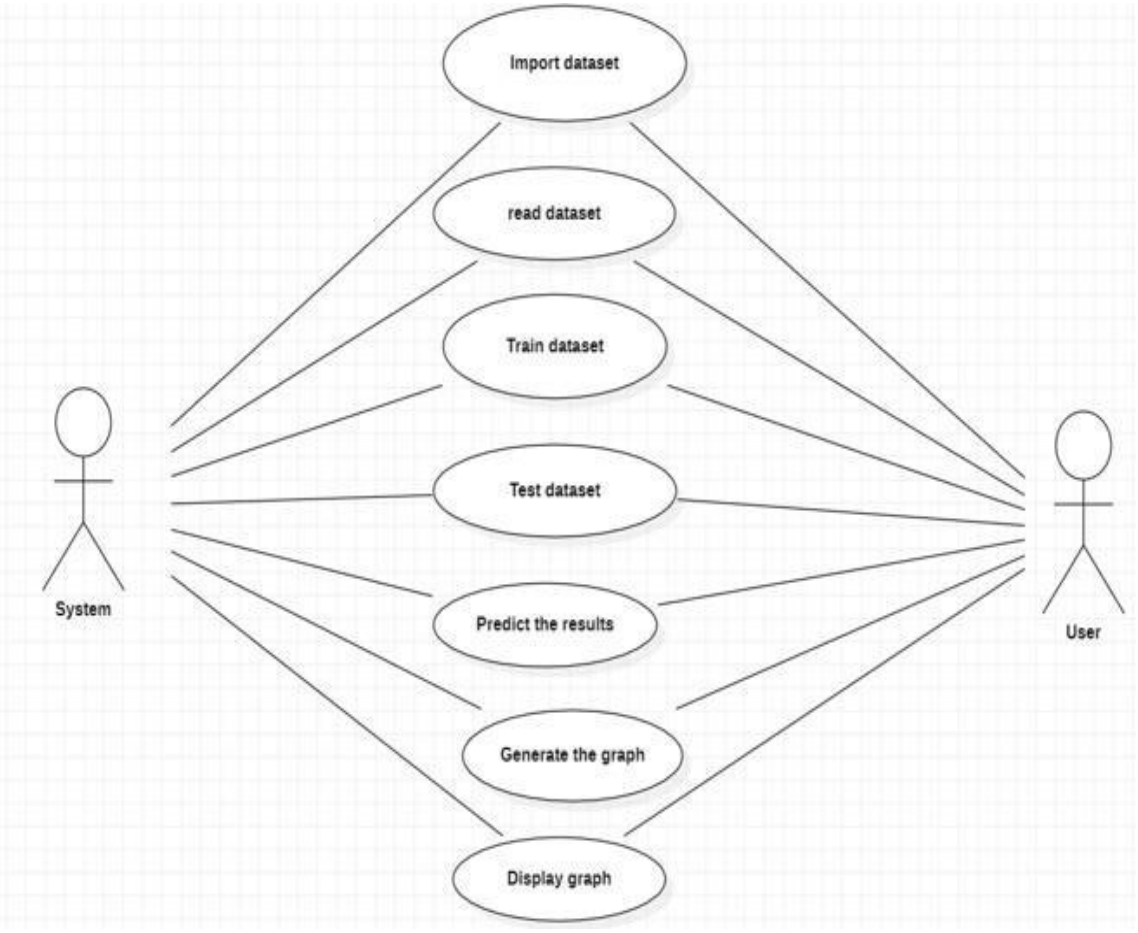


Figure 3.2: Use Case Diagram for prediction of engineering branch selection for Inter students.

3.4 CLASS DIAGRAM

Class diagram is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes,operations,and the relationships among objects.

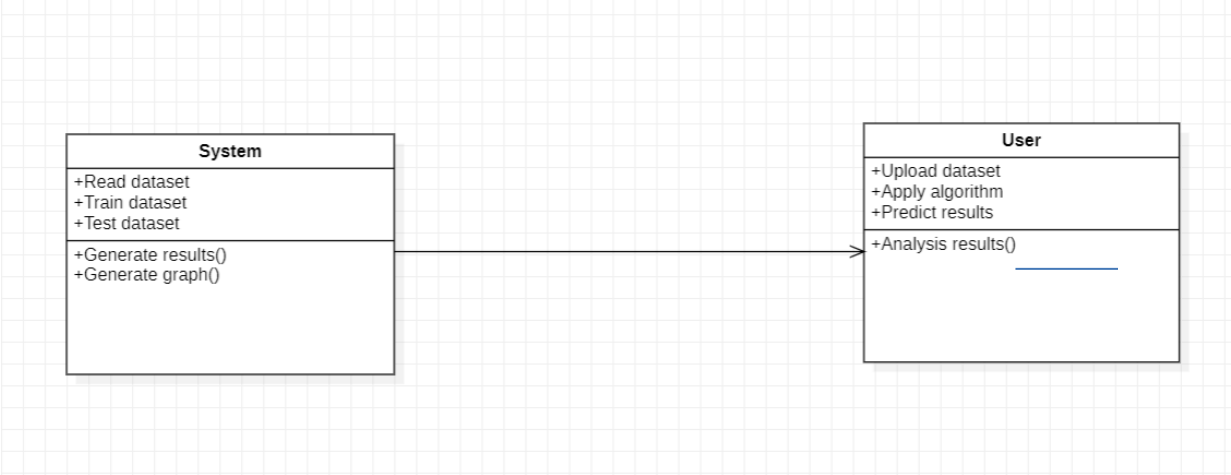


Figure 3.3: Class Diagram for prediction of engineering branch selection for Inter students .

3.5 SEQUENCE DIAGRAM

A sequence diagram shows object interactions arranged in time sequence. It depicts the objects involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams are typically associated with use case realizations in the logical view of the system under development.

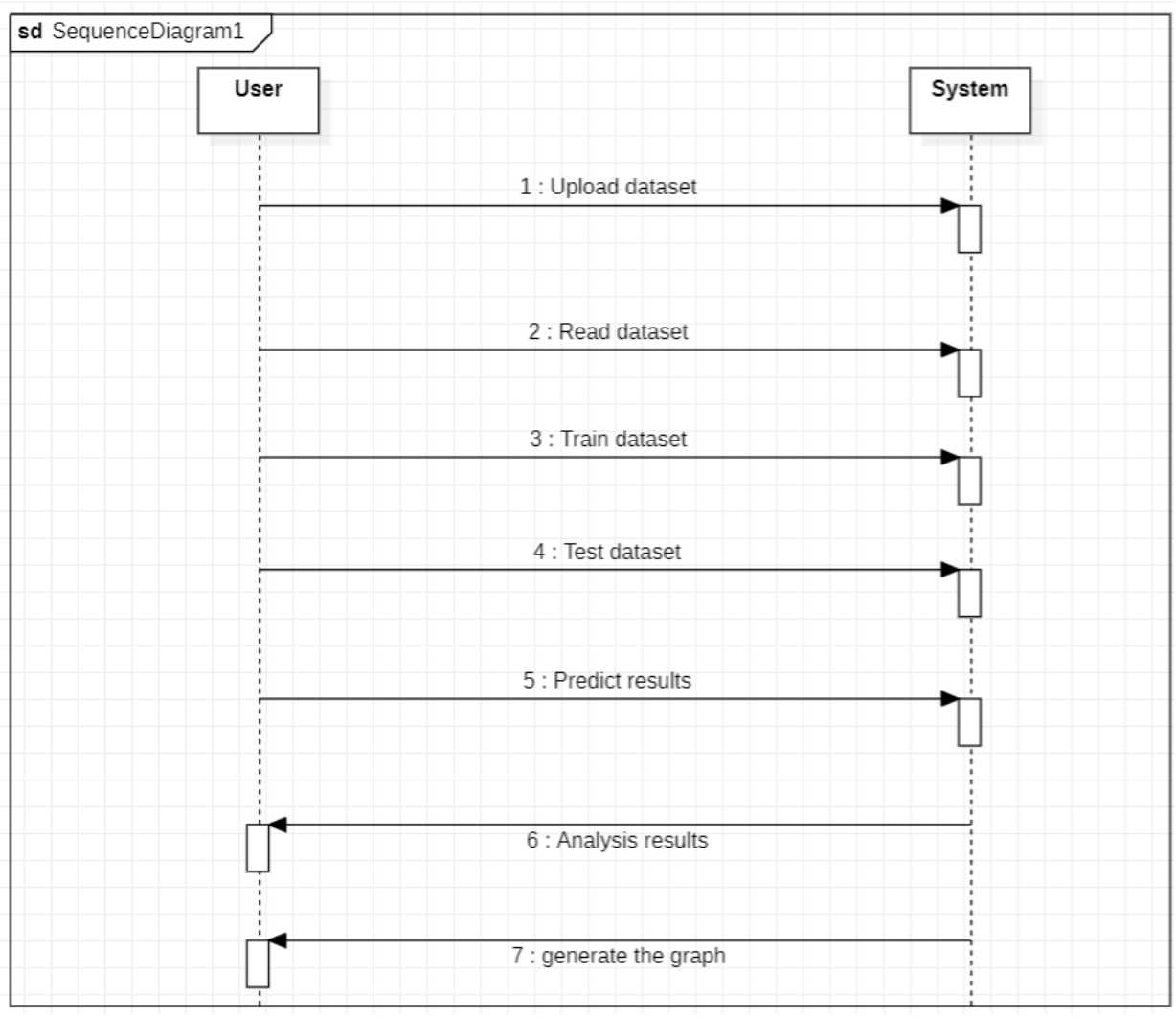


Figure 3.4: Sequence Diagram for prediction of engineering branch selection for Inter students

3.6 ACTIVITY DIAGRAM

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. They can also include elements showing the flow of data between activities through one or more datastores.

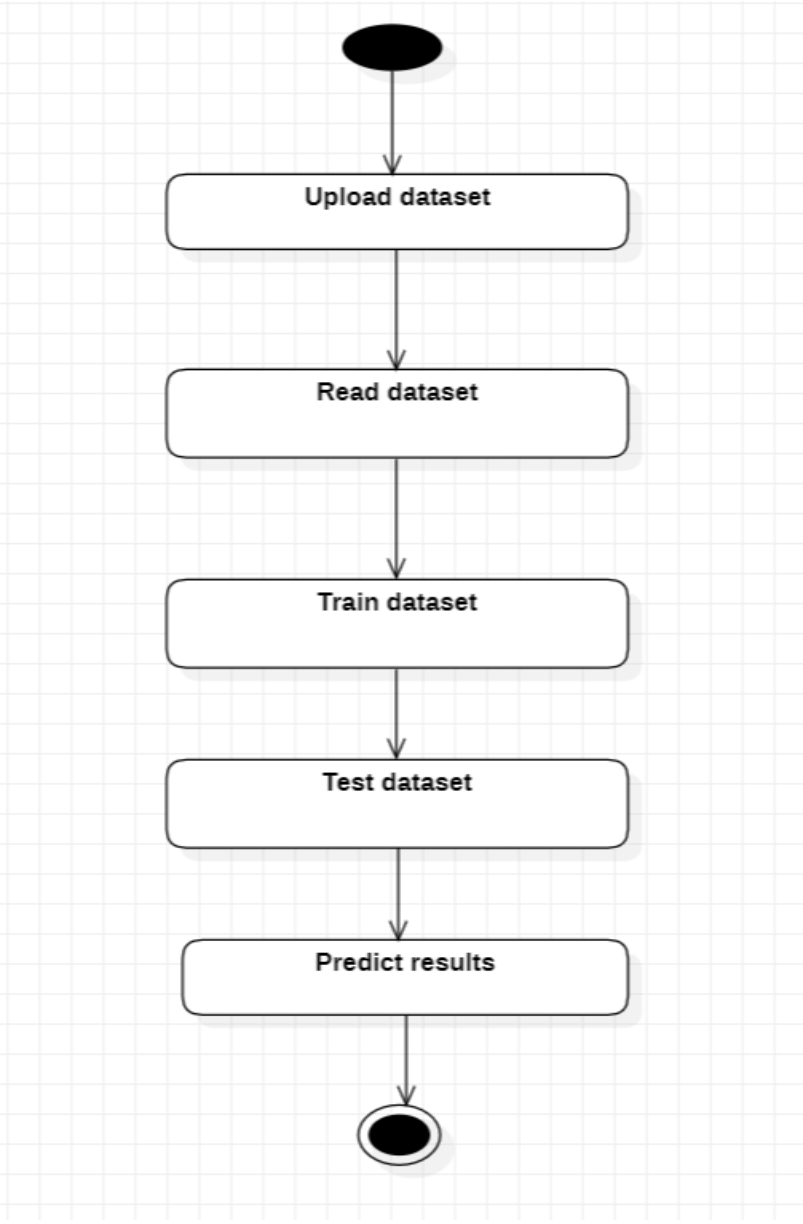


Figure 3.5: Activity Diagram for prediction of engineering branch selection for Inter students

4.IMPLEMENTATION

4.1 SAMPLE CODE

```
import pandas as pd
import numpy as np
from sklearn.preprocessing import LabelEncoder
from sklearn.metrics import accuracy_score
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier
from sklearn.ensemble import RandomForestClassifier
from sklearn.svm import SVC
from sklearn.preprocessing import MinMaxScaler
sc = MinMaxScaler(feature_range = (0, 1))
dataset = pd.read_csv("CollegeDataset/Dataset.csv", usecols=['rank',
    'gender', 'caste', 'region', 'branch', 'college'], nrows=2000)
dataset.fillna(0, inplace = True)
print(dataset)

encoder = []
columns = ['gender', 'caste', 'region','branch', 'college']

print(np.unique(dataset['gender'].tolist()))
print(np.unique(dataset['caste']).tolist())
print(np.unique(dataset['region']).tolist())
print(np.unique(dataset['branch']).tolist())

for i in range(len(columns)):
    le = LabelEncoder()
    dataset[columns[i]] =
    pd.Series(le.fit_transform(dataset[columns[i]].astype(str)))
    encoder.append(le)

dataset = dataset.values
X = dataset[:,0:dataset.shape[1]-1]
Y = dataset[:,dataset.shape[1]-1]

X = sc.fit_transform(X)
```

```
indices = np.arange(X.shape[0])
np.random.shuffle(indices)
X = X[indices]
Y = Y[indices]

print(X)
print(Y)

X_train, X_test, y_train, y_test = train_test_split(X, Y,
    test_size=0.2)
X_train, X_test1, y_train, y_test1 = train_test_split(X, Y,
    test_size=0.1)

cls = RandomForestClassifier()
cls.fit(X_train, y_train)
predict = cls.predict(X_test)
a = accuracy_score(y_test,predict)*100
print(a)

testData = [71654, 'F', 'BC_B', 'OU', 'PHARM - D (M.P.C. STREAM)']
temp = []
temp.append(testData)
temp = np.asarray(temp)
print(temp.shape)

df = pd.DataFrame(temp, columns=['rank', 'gender', 'caste', 'region',
    'branch'])
for i in range(len(encoder)-1):
    df[columns[i]] =
    pd.Series(encoder[i].transform(df[columns[i]].astype(str)))

df = df.values
df = sc.transform(df)
predict = cls.predict(df)
print(predict)
print(encoder[4].inverse_transform(predict))
```

```
create database CollegePrediction;
use CollegePrediction;

create table signup(username varchar(50) primary key,
password varchar(50),
contact_no varchar(15),
gender varchar(20),
email varchar(50),
address varchar(50));
```

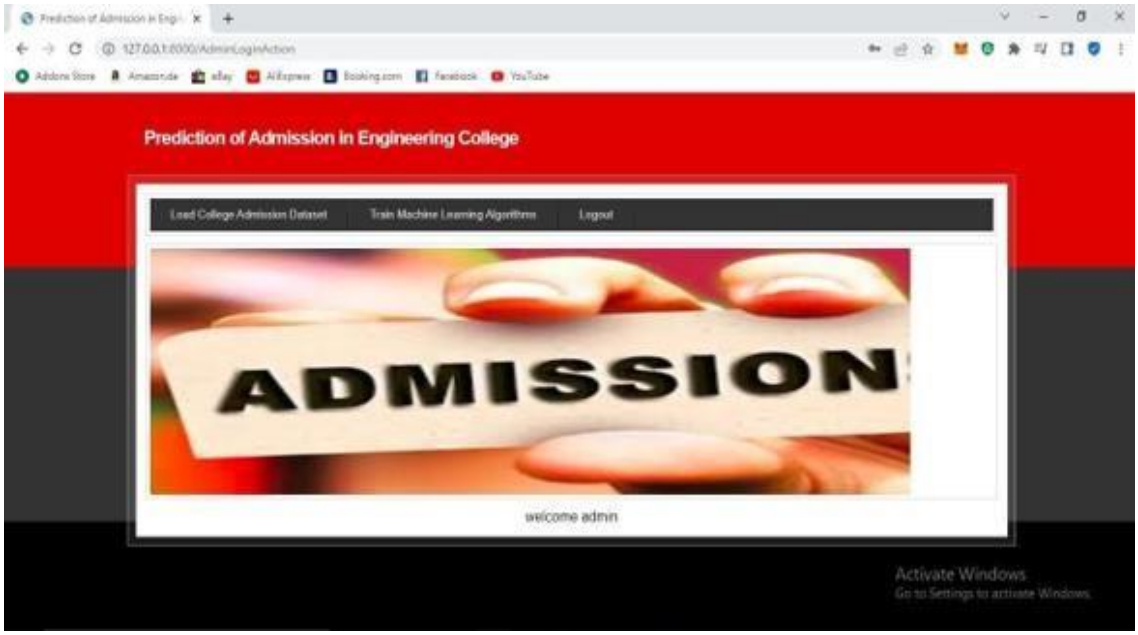
5.SCREENSHOTS

SCREENSHOTS

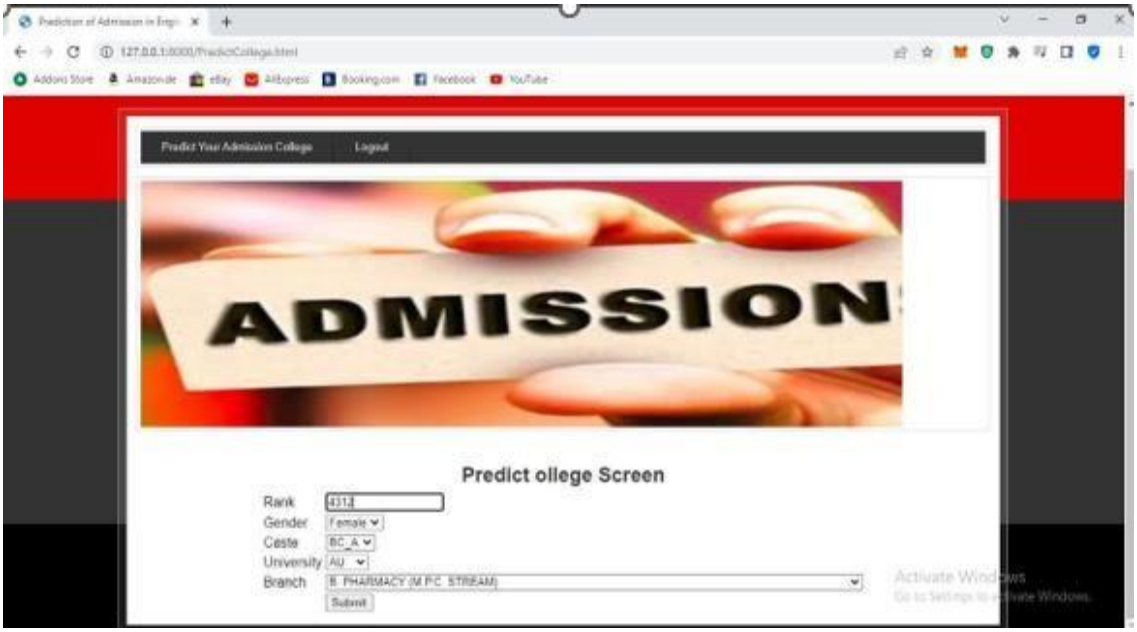
Screenshot 5.1: Upload admin Image

Screenshot 5.2: click on new user sign up to load image

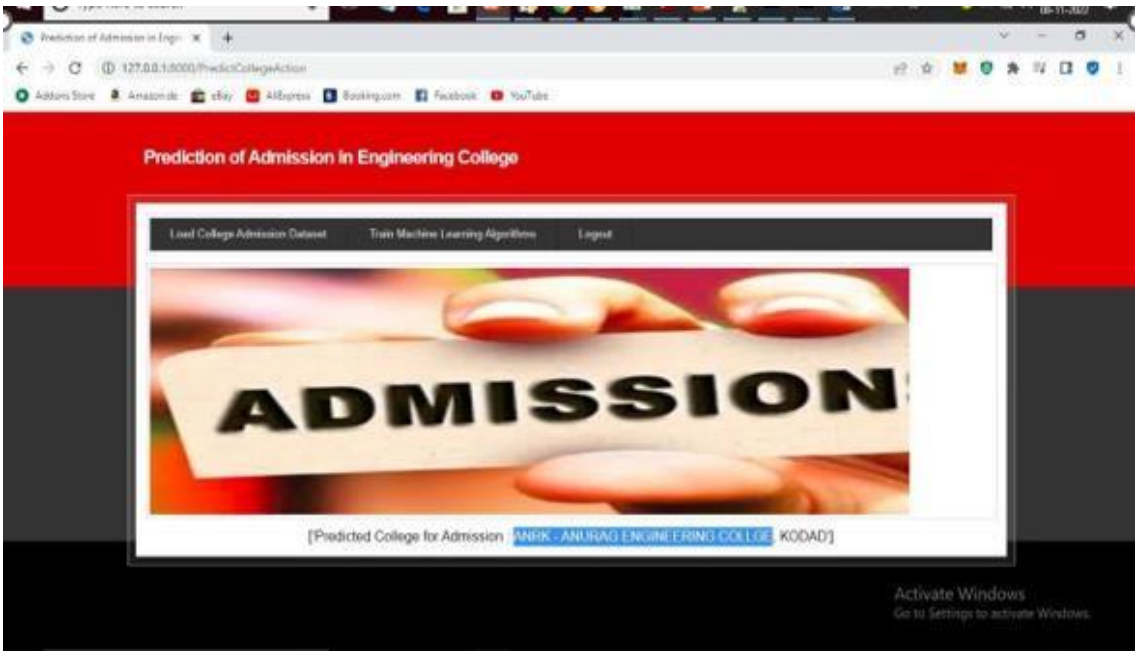
Screenshot 5.3:Submit to load image



Screenshot 5.4:Welcome admin image



Screenshot 5.5:Predicting the college screen



Screenshot 5.6:shows the predicted college

6.TESTING

6. TESTING

6.1 INTRODUCTION TO TESTING

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, subassemblies, assemblies and/or a finished product. It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of tests. Each test type addresses a specific testing requirement.

6.2 TYPES OF TESTING

6.2.1 UNIT TESTING

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .It is done after the completion of an individual unit before integration. This is a structural testing that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

6.2.2 INTEGRATION TESTING

Integration tests are designed to test integrated software components to determine if they actually run as one program. Integration tests demonstrate that although the components were individually satisfactory, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

6.2.3 FUNCTIONAL TESTING

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is centered on the following items:

Valid Input	: identified classes of valid input must be accepted.
Invalid Input	: identified classes of invalid input must be rejected.
Functions	: identified functions must be exercised.
Output	: identified classes of application outputs must be exercised.

Systems/Procedures: interfacing systems or procedures must be invoked. Organization and preparation of functional tests is focused on requirements, key functions, or special test cases.

6.3 TEST CASES

6.3.1 CLASSIFICATION

S.NO	TEST CASE	EXPECTED RESULT	RESULT	REMARKS(IF FAILS)
1.	User Register	If User registration Successfully	Pass	If already user email exist then it fails
2.	User Login	If Username and password is correct then it will get valid page.	Pass	Un Register Users will not logged in
3.	User View	Show our dataset	Pass	If dataset not available fail
4.	User Prediction	Display Review with true results	Pass	Results not True Fail
5.	Admin Login	Admin can login with his login credential.If success he will get his home page	Pass	Invalid login details will not allowed here
6.	Admin can activate the register users	Admin can activate the register user id	Pass	If user id not found then it won't login
7.	Results	For our four models the accuracy and F1 score	Pass	If Accuracy and F1 score not displayed fail

Table Name: Test Cases

7. CONCLUSION

7.CONCLUSION & FUTURE SCOPE

7.1 PROJECT CONCLUSION

In every year there will be approximately 3 lakhs of students are coming out from junior colleges.1.5 lakhs are writing the Eamcet but only 90Thousands students are getting qualifying for the engineering. Remaining going for management. The students are going counselling will have a lots of confusion on branch Selection. To avoid these type of confusions we are doing the project on Prediction of Engineering Branch Selection for Inter Students. Prediction of Engineering Branch Selection for Inter Students projects main concept is to good clarity among the branches of Engineering. In this project we will provide clear idea on the engineering branch Selection

7.2 FUTURE SCOPE

A student by himself is not mature enough to take right decision in his early life.Selecting the wrong courses means mismatch between student aptitude,capability and self intrest.Faculty or this recommended system has been evolved to provide him guidance in selecting a engineering branch.

8.BIBLIOGRAPHY

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8.1 REFERENCES

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- .A. Peña-Ayala, "Educational data mining: A survey and a data mining-based analysis of recent works,"*Expert SysteQms with Applications*, vol. 41, pp. 1432-1462, Mar. 2014.
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8.2 GITHUB LINK

https://github.com/mahadevsrinathgoud/Prediction-of-engineering-branch