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Career Guidance Recommendation System using AI

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Abstract: The Career Guidance Recommendation System is used to assist students who are in their 10th and 12th grade of studies by helping them choose their field of study according to their interests, skills and their marks obtained in their final board exams. The career choice that young people make at school/college has a big impact on their lives. So the aim is to assist individuals to make better educational choices. The project exploits different forms of Artificial Intelligence at different stages of decision making. For data manipulation, we will use python's NumPy and Pandas library. The system first uses a Naive base Classifier System we develop a set of educational choices with regards to his mark. Using the Recommendation system the interests and likeliness of the students are evaluated and give a suggested course. Finally, the results from these two systems are evaluated and suggest a fitting course which will help them to pursue their Ambition. The system will also try to recommend the best college for that particular course the system suggests.

Keywords: Naive Bayes Classifier, Recommendation System, AI, Python.

I. INTRODUCTION

In modern times with much advancement in technologies, there are many fields a student can choose for his/her future studies according to their perspective interests. It is a common issue that every student faces when coming to choose their field of study after their 10th or 12th grade. Many students come into a situation of choosing the course that is opposite to their interest and their skills and ends up choosing the ones that are suggested by others for their higher studies. Hence the students are unable to shine in their field of interest and try to convince themselves in the field of study that they have chosen wrong. The provision of career counseling services is one of the main factors furnishing a student's academic success. Choosing the right course for their higher studies is a very important decision a student has to take which decides his/her future. Students as of that particular age are confused and not mature enough to take correct decisions regarding their higher studies and selecting wrong courses may lead to the mismatch between their interests and the chosen field of study. Hence this Career Guidance Recommendation System will guide them in the correct way to choose their right course.

II. EXISTING SYSTEM

There are few existing career guidance systems. These Recommendation systems do not give a solution for the 10th-grade students who are confused with the field of study to choose for their higher studies stream like whether to choose Diploma in any such specifications or HSC which has so many specified courses but only gives career suggestions for 12th graduates to choose the course. Another drawback in the system is that individual personality traits are not taken into consideration which does not make the system much effective and the other drawback in the system is, it provides recommendations for the students of CSE/ IT streams only. It does not suggest the colleges for the recommended course suggested by the system. In the proposed project contains a complete recommendation system of career guidance right after the 10th grade. The proposed system contains the different forms of Artificial Neural Networks at different stages of decision making and allows the students to select an apt course which will help them to pursue their Ambition. We present the dataset built using the questionnaire and skill tests to extract the information regarding their interests, abilities. Another important feature of the project is that the system will try to recommend the best college for that particular course.



Fig. 1: Existing System Architecture

III. PROPOSED SYSTEM

The project exploits different forms of Artificial Intelligence at different stages of decision making. For data manipulation, we will use python's NumPy and Pandas library. The system first uses the Naive Bayes classifier to develop a set of educational choices with regards to his mark Using the Recommendation System find the likeliness of the student such as their personality traits, skills and interests and at intermediate steps we use mathematical calculations such as Union and Intersection to get the final system. The final suggested course from the system will be a fitting course which will help the students to pursue their Ambition. The course from the system will be fed to another recommendation system which will help the students to find the top rated colleges for that particular course that is suggested in the system.

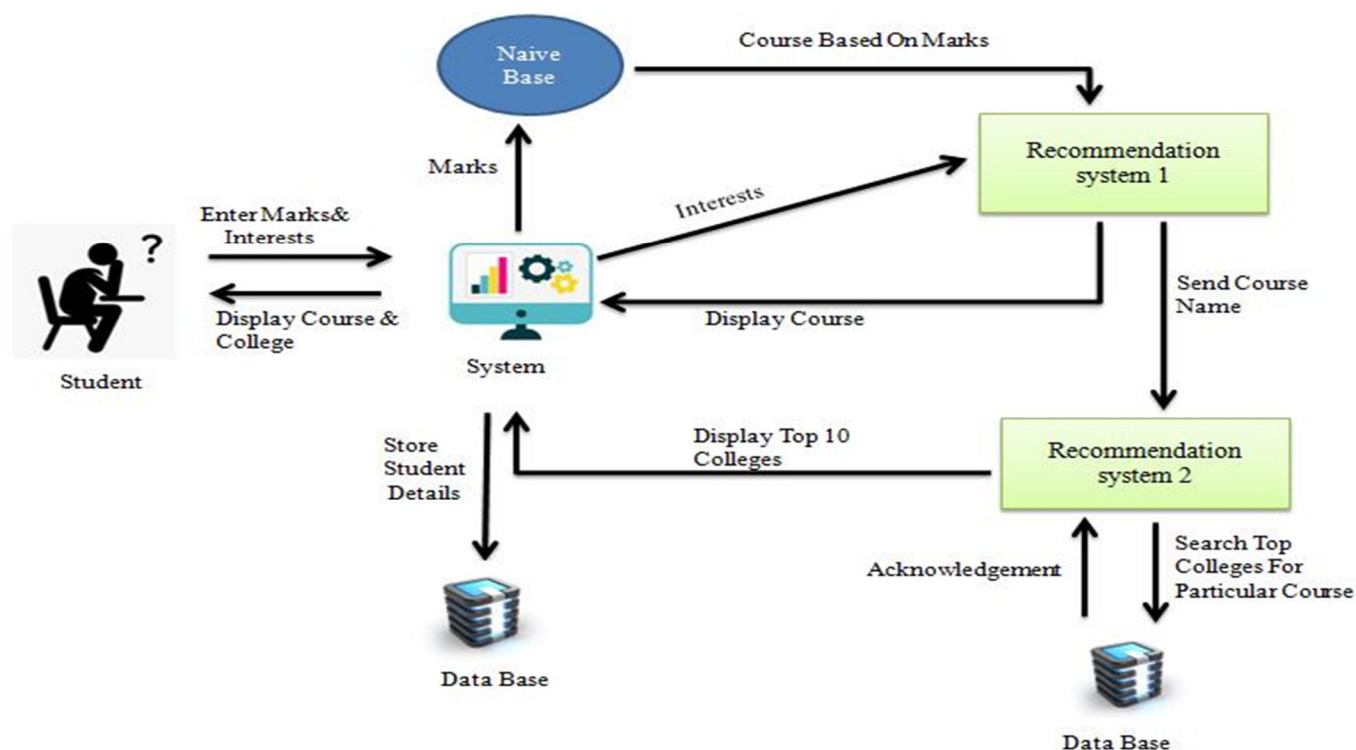


Fig. 2: Career Guidance Recommendation System Architecture

IV. WORKING OF PROPOSED SYSTEM

The android mobile application obtains student's marks, interests and skill details using forms. All these details are stored in the database. When the students feed the data of their marks and interests, the system evaluates the input with these modules,

A. Naive Bayes Classifier

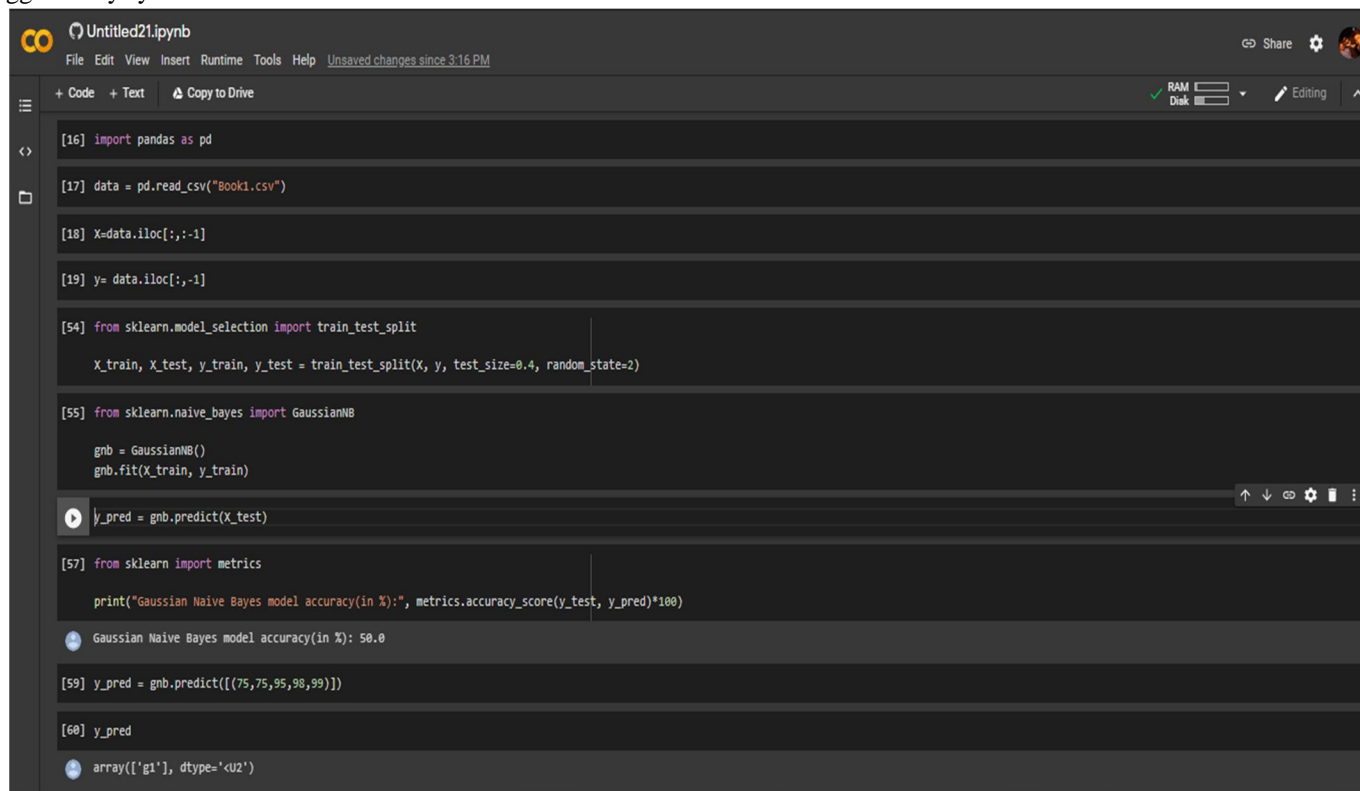
The Naive Bayes classifiers are a collection of different classifying algorithms based on Bayes' Theorem. It is not just a single algorithm but a family of algorithms where all of them share a common Bayes' Theorem. This module is used to evaluate and conclude the courses/field of study with respect to the marks entered by the student. Once the students enters the marks, Naive bayes Classifier system evaluates the marks and suggests a course that are purely based on their marks, regardless of their grade in which a student is studying.

B. Recommendation System I Based on Interests

A recommendation system is one that seeks to predict the "score grades" or "preference" a user would give to a model. This module is used to evaluate the courses/ field of study according to the skills and interests. The system collects the interests of the student to make the system more effective and then the system suggests a course which is related to the specific interests that a student is entered. The module handles mathematical functions inside so that it can match and relate the output of the Naive Bayes system and the Recommendation system I.

C. Recommendation System II Based on College Database

Once the result from the Recommendation system I arrives, it suggests the top rated colleges for that specific courses that are suggested by system.



```

[16] import pandas as pd

[17] data = pd.read_csv("Book1.csv")

[18] X=data.iloc[:, :-1]

[19] y= data.iloc[:, -1]

[54] from sklearn.model_selection import train_test_split

      X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.4, random_state=2)

[55] from sklearn.naive_bayes import GaussianNB

      gnb = GaussianNB()
      gnb.fit(X_train, y_train)

      y_pred = gnb.predict(X_test)

[57] from sklearn import metrics

      print("Gaussian Naive Bayes model accuracy(in %):", metrics.accuracy_score(y_test, y_pred)*100)

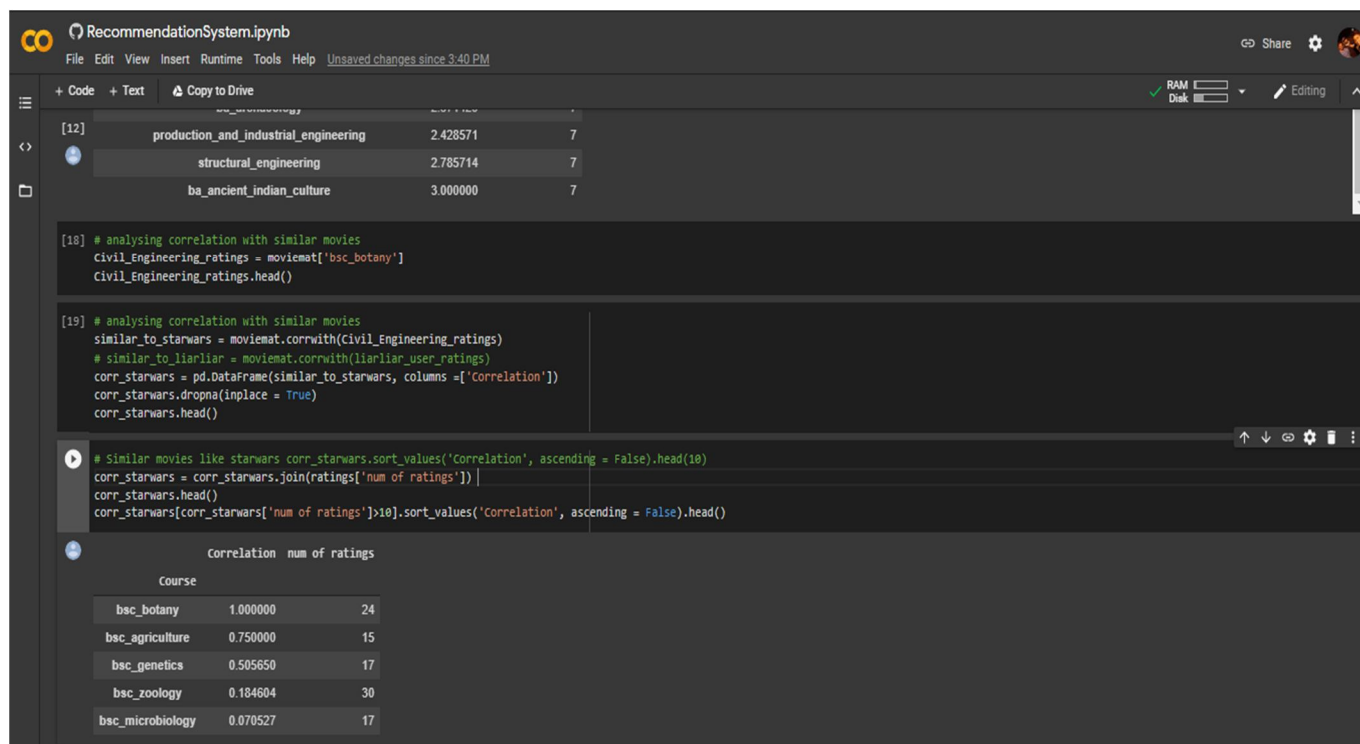
      Gaussian Naive Bayes model accuracy(in %): 50.0

[59] y_pred = gnb.predict([(75,75,95,98,99)])

[60] y_pred

      array(['g1'], dtype='<U2')
  
```

Fig 3: Naive Bayes Classifier for suggesting course based on marks



```

[12]      production_and_industrial_engineering      2.428571      7
      structural_engineering      2.785714      7
      ba_ancient_indian_culture      3.000000      7

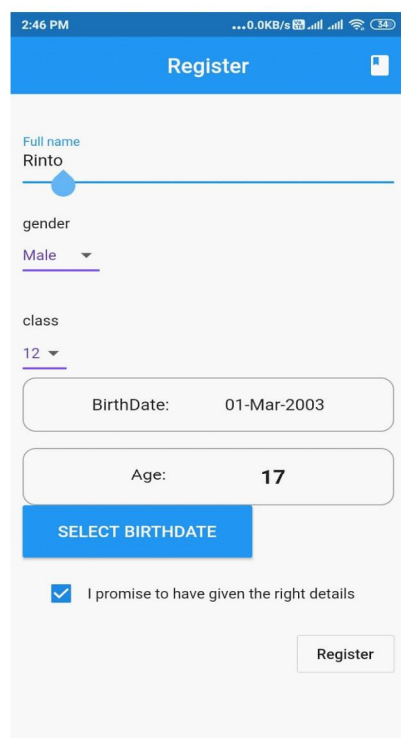
[18] # analysing correlation with similar movies
      civil_engineering_ratings = moviemat['bsc_botany']
      civil_engineering_ratings.head()

[19] # analysing correlation with similar movies
      similar_to_starwars = moviemat.corrwith(civil_engineering_ratings)
      # similar_to_liarliar = moviemat.corrwith(liarliar_user_ratings)
      corr_starwars = pd.DataFrame(similar_to_starwars, columns=['correlation'])
      corr_starwars.dropna(inplace = True)
      corr_starwars.head()

      # Similar movies like starwars
      corr_starwars.sort_values('correlation', ascending = False).head(10)
      corr_starwars = corr_starwars.join(ratings['num of ratings'])
      corr_starwars.head()
      corr_starwars[corr_starwars['num of ratings']>10].sort_values('correlation', ascending = False).head()

      Correlation  num of ratings
      Course
      bsc_botany      1.000000      24
      bsc_agriculture      0.750000      15
      bsc_genetics      0.505650      17
      bsc_zoology      0.184604      30
      bsc_microbiology      0.070527      17
  
```

Fig 4: Recommendation system I for course based on interests



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Register

Full name
Rinto

gender
Male

class
12

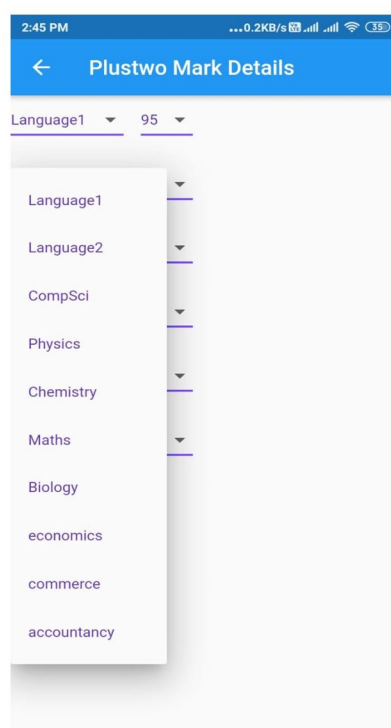
BirthDate: 01-Mar-2003

Age: 17

SELECT BIRTHDATE

☒ I promise to have given the right details

Register



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Plustwo Mark Details

Language1 95

Language1

Language2

CompSci

Physics

Chemistry

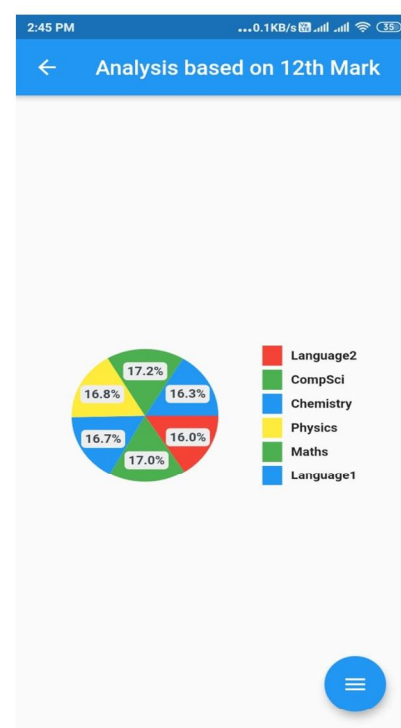
Maths

Biology

economics

commerce

accountancy



V. FUTURE ENHANCEMENT

The future enhancement for this project is to provide course recommendation for all stream of education system such as state board, central board of secondary education (CBSE) and Indian Certificate of Secondary Education (ICSE). The system will be helpful to enhance the efficiency of system with the help of database of the students. The system can be upgraded with data that are manually entered by the students to increase the accuracy. At present we are using MS – Excel for the data manipulation which can be further upgraded into MongoDB when data size increases.

VI. CONCLUSION

The Career Guidance Recommendation system helps the students to choose their career based on their interests they have chosen. This system will reduce the confusion and stress among the students who are in 10th or 12th grade by guiding them to choose a right path to follow their interests and to shine in the field which will mould his/her talents. The increased number of data that are collected and used for the system increases the accuracy of the system to suggest the course for the student. Hence the system is more functional when many number of data that are fed. So this system will surely help the students to clear all the doubts that arouse after their schooling and also it will be more helpful to enhance the efficiency of system with the help of database of the students.

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