College Recommendation System Using Machine Learning

Rajaram Ambole [1], Kartiki Hinge [1], Pallavi Jatiya [1], Renuka Bhosale [1], Shrddha Bolshette [1]

[1]Student, Department of Computer Engineering, Vidya Pratishthan's Kamalnayan Bajaj Institute of Engineering & Technology, Savitribai Phule Pune University, Baramati, Pune, India.

Corresponding Author: kartikihinge77@gmail.com

Abstract: - Now-a-days selecting an appropriate college is a big deal for students. Many students face problem while selecting the proper college which will fit their requirements. So, using machine learning college recommendation systems are made to assist students, guide and recommend the perfectly suitable and best colleges to the students. This system is 'College Recommendation System' which will help students completing their HSC and willing to take admission in best engineering college according to their marks and requirements. Algorithms used in this system are machine learning algorithms as like semi supervised learning algorithms, decision trees, etc. Building such a system for students will reduce the student's time in searching the colleges. This application requires the user to fill in some of the mandatory details and provides the student with the probability of securing admission in the college.

Key Words: - *College Recommendation, machine learning, semi supervised learning algorithms.*

I. INTRODUCTION

College Recommendation System is a web application for students to make the college selection procedure easier. This system will help the students to choose the best among huge number of options. So, this system works well by considering all the parameters like marks obtained in HSC, entrance exams, university they want to prefer. Depending upon the users input the system will work and recommend a college which fits his/her requirements. So, developing such a recommendation system is a big deal as it needs the bigger dataset but it's quite interesting to work with this project. This system is most needed system because this system will reduce the student's burden and work for searching and analysing the colleges. So, using this it will be much affordable and easier to get the relevant college list. This system will be free for students and hence it will be easy for them to use it and get help from us.

For using this system, the student, he/she has to do the registration and create a profile. While creating the profile user must enter the appropriate and valid information about himself /herself. For creating the profile user has to enter the name, marks obtained in HSC and entrance exams for which he had appeared, his 12th std. college name, the preferred University etc. This system considers all those parameters and recommend a college for students, so that it becomes easier for them to fill the forms for college selection and get the seat in best college in accordance with the marks and requirements. In addition to the recommendation this system also provides the list of colleges and its information so that it will get easier for students to compare and analyze the colleges and select among it. The list will be displayed on the home page where the user will be able to see the abstract information about the college. So, such type of system is very helpful and beneficial to the users which will assist them to select the college within few clicks.

II. LITERATURE REVIEW

User friendly college recommendation system was specially made for the 12th completed students. This system uses user's Facebook profile for taking the information. In their system they have developed a recommender system that understands user's need and accordingly generates recommendations for him/her through simple inter- face, which provides information to the students and advisors to improve the choice of courses.

They have used hybrid approach which combines advantages of Collaborative filtering algorithm and Content based filtering algorithm to improve our recommendations. Their system consists of an interactive user profiling process in order to construct profile of the User. The system consists of no of attributes based on which questions are framed. This system also shows college rankings. Algorithms used in this system, Collaborative Filtering, Content Based Recommendations, Demographic Recommendations, Knowledge Based Recommendations, Hybrid Recommendations. This system provides one stop portal as the source of information for all academic institutions. But extracting Knowledge from the generated user profile was a big deal. [1]
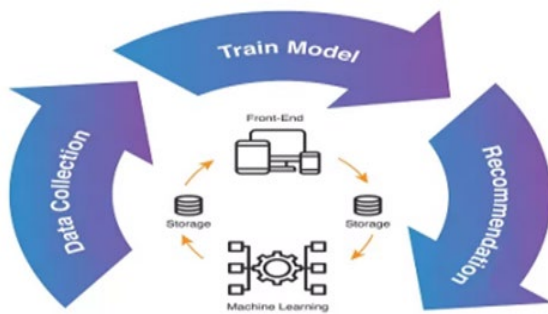
Designing a recommendation system that could understand the skill set and interest of a student through the data from the user's profile to suggest recommended options of colleges for the users to select. This is a college recommendation system which takes into account all the major factors on which the choice of the right college depends. The system also helps the students in selecting the right college for them as important factor such as score, preferred study subjects / domain of study, areas and countries and also other parameters are considered for presenting the best matches. Also, they have some additional options for the students who want to pursue P.H.D as these students want to pursue their degree under some professor. They also provide the students with the most matched faculties with the student's profile. This also helps students in constraining their search criteria. System's react server calls the LinkedIn API which redirects the user and asks permission from the user to allow our app do authentication through his LinkedIn account also to use his basic information to provide accurate results in the app functions. The access token is used to fetch user details and basic LinkedIn user profile from the LinkedIn API. It applies TF-IDF vectorization and cosine similarity to predict the best-matched subject and colleges for the profile of the user. [2]

The system contains variety of range of filters through which student can get list of colleges based on his/her criteria. Other system build on same objective are web page sites while our system is desktop application that a user can use with ease. This proposed system aims to develop the software for SSC passed students in order to help them in their admission process. This project helped the high school students to get the list of colleges based on their scores. Algorithms used Naive Bayesian's and Decision Trees which are useful to solve the given problem. The algorithm which has higher accuracy in recommending the best college is to be used. Therefore, this technique would be helpful to students for minimizing their time in searching colleges. Their system consists of total four modules which describe the various aspects for recommending colleges, details of the all colleges, branches and comparison with other colleges. [3].

The algorithm has been developed can be modified accordingly so that it will function properly for the new pattern as well, for obtaining admission for different colleges. The main focus here has been given to the engineering field and the data has been collected accordingly. So, the students opting for the engineering fields may enter their marks in order to get an appropriate for the colleges suitable for them. Similarly, this system is used for several other fields such as medical, pharmacy etc. The system is designed for two modules Admin and Student respectively, which are the basic working areas in the system and which have limited modules in it. In the College Admission Predictor and Smart List Generator the developer used Ada boost algorithm. The Ada Boost algorithm is a binary classifier, which classifies the given input into two classes. It classifies the input data based on the classification from multiple decision trees. The majority of the classification obtained from the determined number of decision trees is the classification of the algorithm.

III. PROPOSED MODEL

The system is designed so that it will help students to get the most appropriate college in accordance with their marks obtained in 12th, CET, JEE, and other preferences given by user. The system will also display college lists with its information. The algorithms used in performing the crucial task

of recommendation i.e prediction of results is done using machine learning algorithms like random forest and decision tree. In this way the system is designed by considering all the demerits and limitation of previously designed systems. Further we can work on all these things to make the system more reliable and effective.

3.1 Process

In first stage of the project, we will start making frontend and back-end of the system. Then we started preparing the database which will contain the list of all Engineering colleges, user's details, registration details, cut-off details, login details and many more useful information. All information of colleges that we have put in database is be based on student's reviews. These reviews are collected by us personally from some of the students of various colleges and by the way of google sheets. These reviews are be based on various parameters like teaching, college environment, training, etc. Our system compares students score with college's cut-off and generate list. System also generates ratings based on users provided reviews. Our system, predict colleges using efficient prediction algorithm. Datasets used in building this model are created and made by us, we have gone through different college cutoffs, understood their criteria and done the dataset entries.

3.2 Algorithms

- Decision Tree- Decision tree is used to find the class of dataset. There is a method known as attribute selection measure that may be used to choose the optimal attribute for the root node which is based on Information Gain and Gini Index.
- Random Forest- Random Forest is a classifier that uses many decision trees on different subsets of the provided dataset and averages the results to increase the dataset's predicted accuracy. Instead of depending on a single decision tree, the random forest uses forecasts from each tree and predicts the result based on the votes of the majority of predictions. Using the training set that best matches the trees for these samples and the training data (p = p1, q = q1,.....pn) with answers (Q = q1,.....pn) and bagging (X times), select a random sample and replace it as follows: For x = 1. . . , X:
- Support Vector Machine- The SVM algorithm's objective is to establish the best line or decision boundary that can divide n-t

- Logistic Regression- Logistic regression is an easy algorithm that estimates the association between one dependent binary variable and independent variables, computing the probability of the occurence of an event.

3.3 Architecture

System Architecture is designing the system with front-end, back-end, module design, pre-processing of data, training and testing the module, and develop the recommendation system, that would predict the college for given input data.
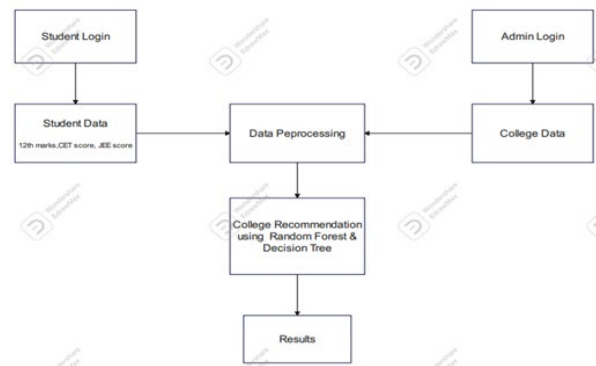

Fig.1. System Architecture

3.4 Features

The features of the system maintain the students records in limited time and less paper work, which helps the students to predict more accurate college in limited efforts.

Table.1. The Features of the system.

Sr. No.	Features
1.	Manage large number of student details.
2.	Limited the paper work and limited efforts
3.	Manage all details of students who registered for the course.
4.	Maintaining the students data effectively.
5.	View all the details of students.
6.	Activities like updating, modification, deletion of record should be easier.
7.	Storing the student and college information.
8.	Students will get list of possible colleges in which they get admission it will easy for them to give preferences.
9.	Students will be able to make right choice of colleges.
10.	Our system will reduce the stress of students.

IV. RESULTS AND PERFORMANCE ANALYSIS

Our proposed system works as follows; Admin: firstly, admin can add, update, delete add the dataset and view dataset and also view complaint/feedback/suggestion.
User can register and login by using registered mail ID and get the list of recommended colleges.
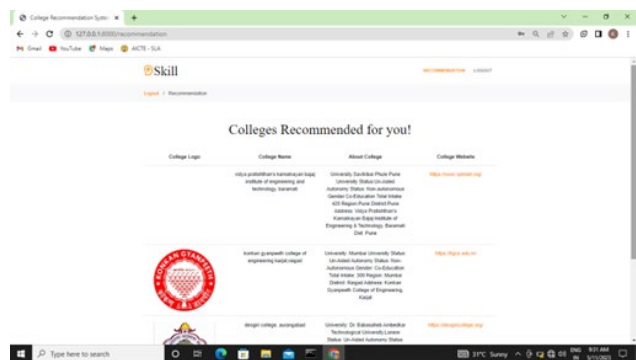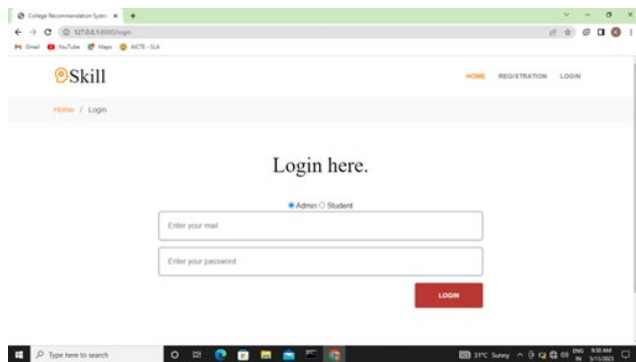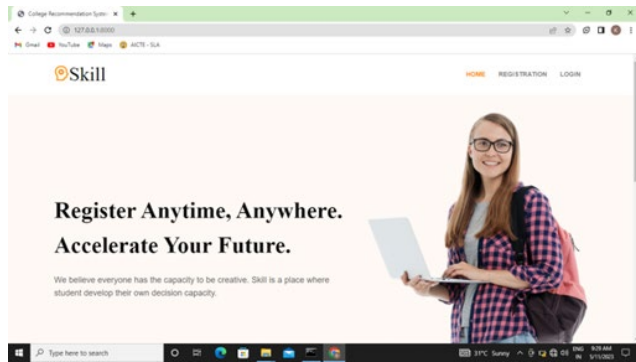

Table.2. Parameters Accuracy and Time complexity

Sr.No	Parameters	Accuracy	Time Complexity
1.	Fetching of results	Good	Good
2.	Insertion of data	Good	Good
3.	Loading of data	Better	Good
4.	Recommendation	Better	Good

V. CONCLUSION

In the proposed system, we have implemented machine learning algorithms to predict the college. At the end our model can predict college to a student based on the criteria given. We can use this model for various other fields like medical colleges, PHD colleges, junior colleges, diploma colleges. This is very useful for students to make the right choice while selecting their college for further studies. This model gives advantages to students so that the college selection procedure becomes easier and within few clicks they can get their expected outcome. So this system is better option for students completing their HSC and looking for institutes to take admission in college for their degree. A college recommendation system's top aim is to accurately predict the colleges for students so that they can visualize their eligibility to take admission at their dream university or college. The efficiency of the system for predicting the results depends on the parameters and the features, volume of dataset given for training the module. The machine learning algorithms used in prediction model are decision tree and random forest, these algorithms help to give simpler and appropriate predictions using the larger dataset considering quality features. So, these machine learning models worked efficiently to give accurate predictions based on given data.

REFERENCES

[1]. Aryan Saxena; Prabhangad Singh; Shailendra Narayan Singh, Gender and Age detection using Deep Learning, IEEE, 2021.

[2]. A User-Friendly College Recommending System Using User-Profiling and Matrix Factorization Technique. (May 2017).

[3]. Vidish Sharma, Tarun Trehan, Rahul Chanana, Suma Dawn, "StudieMe: COLLEGE RECOMMENDATION SYSTEM" (2019 3rd International Conference on Recent Developments in Control, Automation Power Engineering (RDCAPE)).

[4]. Vinit Jain, Mohak Gupta, Jenish Kevadia, Prof. Krishnanjali Shinde, "College Recommendation System". (International Journal of Engineering Research Technology (IJERT) ISSN: 2278-0181 Published by, www.ijert.org ICIATE - 2017 Conference Proceedings, Special Issue – 2017).

[5]. Jadhav Sayali Pramod, Patil Durga Ananda, Kamble Sonali Arun, Shinde Sumit Sahebrao, "College Recommendation System using Machine Learning" (International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 Volume: 07 Issue: 03 — Mar 2020 www.irjet.net p-ISSN: 2395-0072).

[6]. Kiran Kumari (Assistant Professor), Meet Kataria, Viral Limbani and Rahul Soni [Students], Department of Information Technology, "College Admission Predictor and Smart List Generator", K. J. Somaiy.

[7]. Annam Mallikharjuna Roa, Nagineni Dharani, A. Satya Raghava, J. Buvanambigai [Students], K. Sathish (Assistant Professor), Computer Science and Engineering," College Admission Predictor (Volume No. 4, April 2018)", SRM Institute of Science and Technology, Chennai, Tamil Nadu, India, (JNCET) www.jncet.org Volume 8, Issue 4, April (2018).