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Intelligent Recommendation System for Course Selection in Indian Higher Education System

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Abstract: *A student's decision to enroll in a certain educational institution is one of their biggest or most important choices since it affects both their professional development and personal improvement. One of the most important phases of a student's life in India is JEE. It determines each student's future job. Which stream the student will pursue a profession in is determined by JEE. The student's JEE results determine which colleges the student will be admitted to. After JEE, choosing a college is the next stage in a student's career. Selection of a college is crucial since it necessitates much research. Students look for a variety of things while choosing a college, including the campus, the faculty, the extracurricular activities available, To obtain further assurance regarding the veracity of the information, searches are made for college infrastructure, etc., as well as college evaluations. It takes a long time to look up all the information. Therefore, it's crucial to eliminate or greatly minimize this manual effort by software automation.*

Keywords: Python, Html, CSS, colleges, Engineering, Best Colleges Recommendation, Collaborative Filtering

I. INTRODUCTION

In today's technological era, humans employ various techniques to achieve their goals. They develop numerous software and applications to cater to their needs. One such software can generate a comprehensive list of colleges for students who meet the eligibility criteria. The current education system places immense significance on Sparse Linear Method (SLIM) techniques, which can be defined as a sparse linear matrix query input to a data mining system. Moreover, a decision tree approach has been proposed to aid in the selection of colleges during any course program. However, the primary challenge in developing a college recommendation system is compiling an exhaustive database of every college. To generate the list of colleges, the ineligible ones must be eliminated from the pool of all available colleges.

Numerous students from various boards who successfully complete the JEE each year enroll in junior colleges. Students must input some information throughout the admissions process in order to be minimal number of colleges where he could stand a chance of being admitted. The task of choosing colleges to apply to can be time-consuming and requires meticulous research and comparison. To streamline this process, we are embarking on a project to automate the creation of college lists. The goal is to develop a system that generates a list of suitable colleges based on the applicant's eligibility and also provides tools for inter-college comparison. This will eliminate the need for extensive manual searching and save valuable time. Our approach involves utilizing sparse linear matrix and query optimization techniques to build a college recommendation system that is efficient and accurate

II. LITERATURE REVIEW

The authors of "College Recommendation System" by Sankalp Raj, Safiullah Rayeen, Ajeet Kumar, and Abhishek Kumar Bhandari suggested various data analysis and Sparse Linear Matrix that may be utilized for college recommendation system. The purpose of this method is to find engineering institutions for students, parents, and educationalists. By scouring vast amounts of data, recommendation systems address the issue of information overload. There are several prediction methods that assist recommendation systems in gathering information. The necessary data is presented and filtered using Python and Sparse Linear Matrix methods. To get the list of colleges, similar data mining approaches may be applied .

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This document contains information on numerous approaches to write SQL queries. The article entitled "SQL Query Optimization Methods of Relational Database System" authored by Dandan Li, Lu Han, and Yi Ding, provides valuable insights into enhancing the speed of Oracle's database system. It offers several optimization techniques such as dividing large tables, utilizing views, and storing simple outlines, to leverage the various capabilities of the database system. The authors also provide useful SQL tuning methods that can be employed to refine SQL statements for better performance.

"Adaptive Query Processing" by "Amol Deshpande" and "Vijayshankar Raman". The following article provides insights on optimizing query processing in real-time. Executing queries requires a substantial amount of CPU resources, which can pose a challenge to database systems. This paper proposes several strategies to improve the efficiency os query processing in databases Traditionally, relation databases follow a method that involves interpreting the query, generating a logical structure, and then optimizing it using an optimizer. However

To address alternatives such as adaptive loops and symmetric hash joins.[4].

In the scholarly article titled "Classification and prediction-based data miming algorithm to predict based slow learners in education sector" authored by Parneet Kaur, Manpreet Singh, and Gurpreet Singh Josan, Lavanya Mohan, Megha V. Chaudhari, Lakshmi M. Gadhikar, and Deepa Vincent describe the methodology used to gather and refine the dataset of schools using the open-source software WEKA. The researchers then assessed the effectiveness of the Nave Bayes technique, which is a classification technique, to analyze and predict the academic performance of students based on their academic records within the dataset. [5].

Sonali Agarwal, G. N. Pandey, and M. D. Tiwari present the decision tree technique in their work titled "Data Mining in Education: Data Classification and Decision Tree Approach." This technique is fundamental for selecting students for various courses or programs. The educational system can leverage several data mining techniques to improve efficiency in the business intelligence process. Additionally, a decision-making tree can be utilized to help students choose a college based on multiple factors that they specify.

Xiwang Yang, Yang Guo, and Yong Liu proposed a Bayesian Inference-driven recommendation system for online social networks in their research article titled "Bayesian-Inference-Based Recommendation in Online Social Networks." The paper outlines the framework for this system, which leverages Bayesian Inference principles to offer tailored recommendations to users based on their social network activity. The user has the option to tell their friends how they rate the material in this. A set of probability is constructed from the ratings of a buddy pair based on their shared ratings. A Bayesian network is created when a user queries for a certain content rating, and the user's direct and indirect friends are used to construct the rating. The same method may also be applied to obtain college ratings. The ratings of numerous universities, which will be gathered here via various channels including social media, Bayesian's Algorithm may be used to obtain the most probable rating of colleges from Google forms, end-to-end ratings, etc. [7].

Trilok Chand Sharma and Manoj Jain's research article "WEKA Approach for comparison between Naïve Bayes and J48 algorithm, both of which utilize decision trees. To evaluate the accuracy of these techniques, The study's finding, which are based on the cost analysis and classification accuracy, are presented in the paper. The research data from the dataset demonstrates that both J48 and Naïve Bayes exhibit remarkable and accuracy. [8]

III. PROPOSED SYSTEM

Our System can be compared to the existing system, which is currently in place, offers Undergraduate and Postgraduate students alternatives. For kids who have completed the 10th grade or SSC, there is no such system accessible. Our programmed seeks to mentor a student through JEE and into his career. The approach aids students in obtaining a list of universities that are well-known for offering certain courses in a given area. The system has a wide range of filters that students may use to acquire a list of institutions that meet their requirements. While other systems with the similar goal are web page sites, our system is a desktop programmed that anybody may use.

For SSC graduates, our system's goal is to create software that will aid in the admissions process. The high school pupils will benefit from this effort by receiving a list of colleges according to their test results. The student score entered will be compared to the college cut-offs from the previous year, and a list will be generated between +5 and -5 of the student's score. The best-rated college and cut-off would determine the order of the created list. Numerous students from other

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institutions will be gathered to rate the college. In addition to cut-off, the final list would be filtered according to a number of factors such caste information, area, and minority status.

The user would choose which filters to utilize based on his preferences. As a result, the user may fill out the junior college application form using the prepopulated list, which relieves them of the stress of manually compiling the list or running about looking for information about admissions from their seniors.

Furthermore, this project aims to aid students in making informed decisions about their college choice by taking into account their career aspirations and fields of interest.

A. Process

We will begin building the system's front end and back end during the project's initial phase. The proposed database will contain and extensive record of junior colleges, as well as user details, registration records, cut-off statistics, and login credentials, and a lot more relevant data will then begin to be created. All of the information about institutions that we want to include in the database will be based on evaluations by students. We will personally gather these reviews from some of the students at various universities using Google Sheets. These evaluations will be based on a number of factors, including instruction, the campus atmosphere, training, etc. Our technology will provide a list after comparing a student's score to a college's cutoff. Based on the reviews submitted by users, the system also creates ratings. Through the use of an effective rating prediction algorithm, our system will create ratings.

B. Algorithms used

To tackle the above problem, we are employing sparse linear matrices. The algorithm that will be used to propose the best institution is one that is anticipated to have a better level of accuracy. As a result, using this method would let students spend less time looking for institutions. Our method is made up of four modules in total, each of which covers a different component of promoting colleges while also providing information about each college's branches and making comparisons with other institutions.

Our system's four modules in total are outlined below as follows:

- College Search: To utilize this module, a user must enter the name of the college and the campus where he wishes to conduct a search. As a result, the viewer will see a list of colleges that has been created.
- Analogy: The user will have a choice of the colleges he wishes to compare in this module. He will have a greater understanding of the prestigious college by doing this.
- Advanced Search: Using a Google form, we have gathered a variety of scores from the survey. Infrastructure, cultural, technical, athletic, NSS, and other factors are among those on which we have assigned ratings. Other factors include professors, dorms, placement, and fees. We calculated the average of the ratings provided by the students of various colleges in order to obtain a mean value. The user will be prompted to provide his academic information as well as his co-curricular and extracurricular activity interests in this module. Colleges will be shortlisted based on his merit, interests, fees, location, and other information submitted.
- Branch Wise Search: The user will be prompted for his academic information and the name of the college in this module. A list of branches that the student is most likely to receive based on the merits of that particular college will be suggested based on his merit.

IV. PERSPECTIVE

Since there is now no such system, many kids will benefit from our method. Currently, Initially, our system will exclusively cater to SSC students, but as we continue to release future updates, we plan to expand our user base by adding support for the other educational streams. This will enable more higher education students to access our system.

V. CONCLUSION

Therefore, in this essay, we have concentrated on ways to make junior college admissions more straightforward and assist students in selecting universities that are the greatest fit for them and based on their needs. For the purpose of making college recommendations, we have employed a variety of data mining and query optimization approaches. Sparse Linear

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Matrix (SLIM), which will aid in reducing the search time for schools and enable the system to provide optimized results, is also available for more accuracy or optimality in suggestions.

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