University Admit Eligibility Predictor

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Problem Statement:

To develop an application used for university admit eligibility prediction.

Need for Application:

In today's world, it can be seen that many students pursue their higher education in foreign countries away from their native countries. This being the case, students may not be aware of the admission procedures, criteria, requirements, and information regarding admission into various universities. In order to know all this information, students seek help from consultancy firms to help them get admission to universities that best suit their profiles. But, this requires investment from students for consultancy fees. Thus, this project aims at developing an application that uses machine learning-based algorithms to determine the feasibility of a particular student's profile being eligible for university admission. The main objective is to save the time and money spent by the students at education consultancy firms. Moreover, if the students apply only to those universities where he/she has a genuine chance of admission would reduce the application process.

Literature Survey:

Hybrid Recommender System for Predicting College Admission: This paper

proposes a hybrid recommender system for predicting college admissions based on various factors such as historical college admissions data, students' academic merits, background, student records, and college criteria. It provides insight into a hybrid model based on knowledge discovery rules and data mining techniques to predict the admission chances of any given student. The system proposed to hold a web portal for aspiring students to register themselves, which in turn assigns a unique ID number and password to each student. The students are required to enter their personal details, academic history, and desired programs for enrolling in the web portal. These details are used as input to the trained model to make predictions about the student's admission. The system also embeds a sorter and a filter, combinedly known as the Track Recommender, which sorts the students to several university study tracks available and rearranges them based on outstanding backlogs. The HRSPCA uses knowledge discovery rules to cluster students and recommends colleges under reach for each student.

CAPSLG:

In the paper "College Admission Predictor and Smart List Generator", the authors have discussed an application that helps students to make correct preferences of colleges. This application has two main components. The college eligibility predictor and a smart list generator.

- The college eligibility predictor takes in input as the history of cut-off records of the colleges and trains on this data to determine which college the student is likely to get admission to. Not just the cut-off data, the system also examines a student's academic achievements, history, and requirements for college admission. Based on it, it forecasts the likelihood that a student will enroll in a university college.

- Further, the student might create the list of colleges that might be required to be filled out as choices throughout the admissions process using the smart list generator.
- Additionally, the system would receive user feedback, which would be beneficial for evaluating predictions and enhancing the performance factor.

On the whole, The program predicts the best-suited college based on the users' preferences, courses, areas, and cut-off of colleges once they enter their academic scores. The application also provides a list of institutions based on the aforementioned factors, which will assist students in narrowing down their options and more accurately completing their admissions applications.

Primarily, in the paper, the authors have performed an analytical study of various ML Algorithms such as Random Forest, AdaBoost, and Decision Tree by checking their classification accuracies on Breast Cancer, Iris, and Wine Datasets. They concluded that the Adaboost model performed the best and thus, the Ensemble AdaBoost Classifier from the scikit-learn library of Python is used for the classification of the data. The AdaBoost algorithm divides the input into two classes(binary classifier). Based on the classification from numerous decision trees, it categorizes the incoming data. The algorithm's classification makes up the majority of the classification produced from the chosen number of decision trees. As a result, the AdaBoost algorithm is more accurate. Additionally, it extracts the features that are more important for predicting the outcomes. The model is actually pre-trained and pickled. The model is then loaded from the stored pickle and used for prediction tasks, which improves efficiency in terms of time.

The Python-based Django web page rendering framework serves as the foundation for the web application. The Django framework enables the user interface and Python variables to be integrated. HTML and CSS were used to create and style the user interface, which controlled the flow of the application based on user interaction.

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College Admission Prediction using Ensemble Machine Learning Models:
This paper proposes an Education based Prediction System that allows the students to decide on which colleges to apply to with their scores being fed into the application. The dataset consists of the University name, GRE score, TOEFL score, AWA scores, letters of recommendation, statement of purpose, and CGPA scores. It aims at saving time by applying to appropriate colleges based on the predicted admission feasibility. They proposed a novel method by utilizing machine learning models such as Neural

Networks, Linear Regression, Decision Trees, and Random Forest. The algorithms are experimented and the key performance indicators are compared in order to choose the best mode. The application takes in the scores of a particular student and the university as input and generates a probability score as to how likely the student is to get into the university based on the scores.

Linear regression:

Regression models are employed to describe a relationship between many variables by fitting observed data into a straight line. It is used to determine the connection between two numerical variables. Regression models differ in terms of the type of relationship between independent and dependent variables, the number of variables employed, and the variables considered. A linear function that predicts continuous values as a function of independent variables, admission intake, and preferences of students.

Neural Network

Neural networks try to recognize patterns in the underlying data through a process similar to that employed by the human brain. It consists of neurons organized in a series of layers which altogether constitute the entire artificial neural network. The number of layers, the number of neurons in each layer, and the activation function to be used are experimentally determined so as to get the best possible result. The input layer is fed in with the scores of the individual student along with the required university identifier. The data is processed in a series of layers and the output layer uses a softmax layer to restrict the probability of admission in the range of 0 to 1.

Decision Trees

The decision tree algorithm can be used for solving classification and regression problems. It splits the dataset based on the output class label and attributes' values for the records. It assigns class labels for each leaf node and internal nodes contain test conditions on particular attributes.

Random Forest

Decision trees are built on multiple different samples and the majority votes for average. It works successfully for classification problems due to the fact that any huge

quantity of moderately uncorrelated trees working as a body will outperform any of the individual constituent models.

It was found that linear regression outperformed other models and hence has the highest accuracy. The decision tree had the least accuracy of all the models and is spread with a lot of outliers, thus the model was inaccurate.

References:

[1] Ragab, A.H.M., Hybrid recommender system for predicting college admission, Intelligent Systems Design and Applications (ISDA), 29 Nov. 2012, 107-113. [2] CAPSLG: College Admission Predictor and Smart List Generator By Kiran Kumari, Meet Kataria, Viral Limbani, Rahul Soni

[3] College Admission Prediction using Ensemble Machine Learning Models By Vandit Manish Jain, Rihaan Satia