# University Admit Eligibility Predictor for College Admission

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## Introduction:

The students pursuing their 12th grade in schools after completing them will be looking to enter to the colleges to purse their higher career in any of the streams of those that are available (for example – Medical or Engineering or Arts or Agriculture and many more). To purse these courses the Universities and the Colleges will be having criteria based on marks and other details of the students. The marks will be categorized based on the overall cutoff of the state's board exam or CBSE exam. Along with these marks the students might also appear for other exams such as GATE, NEET and many more. These marks will also be taken into consideration by the colleges and be given the priority to enroll in the course wished by the candidate whomsoever applies.

This procedure in a normal way is now being taking a lot of time for the students to wait after finishing their 12th and getting the results. Sometimes it also happens to be a fear among the students and their parents of losing a better a college on the basis of the mark his / her students secured. To avoid this pressure and create a comfort zone for the students, our project UAEP, will be focusing on the various ways in which the students can check their eligibility of each and every of the removed institutes of the states. The marks will be analyzed based on the number of exams wrote by the student, for instance one student takes additional exams like NEET and it will be visualized based on the other scores that the candidate is aiming it. The candidate having only the 12th Board Exam marks will be shown a different way of checking the availability. This makes them plan according to the colleges that are available for each of them and start to apply to them based on the infrastructure and courses provided by the college.

## Literature Review:

There are lots of papers and a few projects done on the University Admission Eligibility Predictor and what and all the problems are tried to find the problem and those of the different papers are as follows:

1. ***Existing Solution -*** *Graduate Admission Analysis and Prediction:*

The project presents an expert system, called PAAS, in which logistic Regression is used to predict the potential of Junior college students to pass the national exam for entering the higher education institutes. They had used a predictive modelling to assess admission policies and standards based on features like GPA score, ACT score, residency race, etc. The major setback of the project is that they that project was not taking into consideration the other exams apart from the ACT score, some candidates must be having some other entry level exams and they also need to include in the system. The techniques used are Data Mining and ML Learning for the admission by predicting the enrollment behavior of the students. They have also used different algorithms for different aspects such as Apriori Algorithm to analyze the student's behavior of entering the college and Naïve Bayes Algorithm for predicting the college for the students based on the scores they secured in the exams. This way the overall probability is not to the level of the highest efficiency of predicting the better and the suitable college for the students. This also needs to have an overall different view as if the candidate has some different exam scores, rather than the regular candidates with just the high school grade, then they need to show a different way to show the colleges for those candidates [1].

2. ***Existing Solution -*** *College Admission Prediction using Ensemble Machine Learning Models:*

This paper aims to build a model that can help students to pick the right universities based on their profiles. We can judge across a wide variety of domains that include MS (international), MTech (India) and MBA (India and International). For the accurate predictions we plan on training a machine learning model in order to provide results. The dataset contains information on the student profile and the university details with a field detailing if the admission was positive or not. Various algorithms have been used i.e., Ensemble Machine Learning and the predictions have been compared using key performance indicators (KPIs). The model performing the best is then used to evaluate the dependent variable i.e. The chances of admit to a university. The chances of admit variable is a variable ranging from 0 to 1 which equates to the predicted probability of successful acceptance to a university. We also aim to create a portal which filters and then provides a list of universities that fall into the profile's acceptance range [2].

3. ***Existing Solution -*** *Predicting Undergraduate Admission: A Case Study in Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Bangladesh:*

The university admission tests find the applicant's ability to admit to the desired university. Nowadays, there is a huge competition in the university admission tests. The failure in the admission tests makes an examinee depressed. This paper proposes a method that predicts undergraduate admission in universities. It can help students to improve their preparation to get a chance at their desired university. Many factors are responsible for the failure or success in an admission test. Educational data mining helps us to analyze and extract information from these factors. Here, the authors apply three machine learning algorithms XGBoost, LightGBM, and GBM on a collected dataset to estimate the probability of getting admission to the university after attending or before attending the admission test. They also evaluate and compare the performance levels of these three algorithms based on two different evaluation metrics – accuracy and F1 score. Furthermore, the authors explore the important factors which influence predicting undergraduate admission [3].

4. ***Existing Solution -*** *A Machine Learning Approach for Graduate Admission Prediction:*

This paper outlines the possibilities of creating an algorithm that can apply to Student Graduate Admission. It appears there that relationship in between all attributes and one attribute during learning. To verify this, we implemented the algorithm using a Linear Regression Model, Decision Tree Model and Logistic Regression Model to see how to use all requirements for studying the postgraduate to predict the chance of admission in different values. To classify different machine learning algorithms, the logistic regression model was the algorithm that achieved the best classification prediction and the most accurate to predict the best of admission. As it contains the smallest number of errors (7.2% RSME) than other algorithms. So the goal of this paper is to create a software by using machine learning, especially using Logistic Regression in the future to help students can know how the possibility of postgraduate admission in universities to help graduates in recognizing and targeting universities that have suited their requirements. [4].

5. ***Existing Solution -*** *Student Admission Predictor:*

This section provides the literature review of the work that has previously done on predicting the chances of student's enrolment in universities. There have been several project and studies performed on topics related to students' admission into universities. (Bibodi et al. (n.d.)) used multiple machine learning models to create a system that would help the students to shortlist the universities suitable for them also a second model was created to help the colleges to decide on enrolment of the student. Nave Bayes algorithm was used to predict the likelihood of success of an application, and multiple classification algorithms like Decision Tree, Random Forest, Nave Bayes and SVM were compared and evaluated based on their accuracy to select the best candidates for the college. Limitation of this research as that it did only rely on the GRE, TOEFL and Undergraduate Score of the student and missed on taking

into consideration other important factors like SOP and LOR documents quality, past work experience, technical papers of the students etc., [5].

6. ***Existing Solution -*** *Graduate Admit Prediction Using Machine Learning****:***

Student admission problem is very important in educational institutions. This paper addresses machine learning models to predict the chance of a student to be admitted to a master's program. This will assist students to know in advance if they have a chance to get accepted. The machine learning models are multiple linear regression, k-nearest neighbor, random forest, and Multilayer Perceptron. Experiments show that the Multilayer Perceptron model surpasses other models. The machine learning models were performed to predict the opportunity of a student to get admitted to a master's program. The machine learning models included are multiple linear regression, k-nearest neighbor, random forest, and Multilayer Perceptron. Experiments show that the Multilayer Perceptron model surpasses other models. As for the future work, more models can be conducted on more datasets to learn the model that gives the best performance [6].

7. ***Existing Solution -*** *An Automated Prediction Model For College Admission System****:***

After intermediate, students desiring to pursue engineering face lot of problem in choosing a good college and branch of their choice. Admission into engineering colleges across states in India happens generally through Common Entrance Tests (CET). The examination authority of every state carries out the admission, through a centralized admission process. This admission process happens through many rounds, depending on availability of seats. First, the students must get their documents verified by the authority. Later, the authority releases the cut-offs of every college, branch-wise and category- wise. Students will be allowed to give their preference list of colleges and branches, which is also known as the option-entry process. Then, based on rank, category and preference list given by the students, college and branch will be allotted to them by the authority [7].

8. ***Existing Solution -*** Graduate Admission Chance Prediction Using Deep Neural Network***:***

Every year many students apply for graduate admission to different universities. To select an applicant, each university has different selection criteria such as GRE score, CGPA, research background, statement of purpose, letter of recommendation, university rating etc. There are some web applications as well as some consultancy services for suggesting the appropriate university based on students' portfolio. These help to give an idea which universities should be applied for admission. But they have limitations because humans are incapable of considering all the conditions and universities. Moreover, web applications have accuracy problems. In this study, we have proposed a deep neural network (DNN) to predict

the chance of getting admitted to a university according to the students' portfolio. All the selection criteria are considered here to predict the chance of admission. The DNN model has been compared with existing methods in terms of different performance metrics including mean squared error (MSE), root mean squared error (RMSE), mean absolute error (MAE), R-squared score. It has shown the most promising result that includes R-squared score of 0.8538 and MSE of 0.0031. The proposed method has also outperformed all the existing methods in each benchmark [8].

9. ***Existing Solution -*** *Prediction for University Admission using Machine Learning**:***

. Generally Higher education in abroad universities means we have many options like Canada, USA, UK Germany, Italy, Australia etc. But we are focusing on only the students who want to do their Masters in America. Students who want to do masters in America have to write GRE (Graduate Records Examination) and TOEFL/IELTS (Test of English as a Foreign Language/International English Language Testing System). Once they have attended the exams, they have to prepare their SOP (statement of purpose) and LOR (letter of recommendation) which are one of the crucial factors they have to consider. These LOR and SOP plays a vital role if the student was looking for any scholarship. Then the students have to choose the universities they want to study or apply, we cannot apply to all the universities that will lead to lot of application fees. Here comes the problem that the student doesn't know to which university he might get admission. There are some online blogs which help in this matter but they are not that much accurate and don't consider all the factors and there are some consultancy offices which will take lot of our money and time and sometimes they will give some false information [9].

10. ***Existing Solution -*** *Predicting Student University Admission Using Logistic Regression**:***

Student admission for the Master's degree program consists of different criteria/scores which is taken into consideration before admitting the student to the degree program. This process is elaborative and requires lot of thought processing and analysis by the selection committee before choosing the right applicants to the Master's degree program. The purpose of this analysis is to demonstrate the top contributing scores which helps the student to get the admission into the Master's degree program. What factors contributes to successful admission to a Master's degree program? The analysis might seem straight forward but caution has to be exercised to consider the scores like GRE, TOEFL, university rating, SOP, LOR and CGPA and any outliers should not impact the decision-making process [10].

11. ***Existing Solution -*** *Multiple Machine Learning Classifiers for Student's Admission to University Prediction**:***

Data is the most important asset for any organization which is further processed to produce useful information. Machine Learning and Big Data techniques are widely used for industrial sectors to generate useful patterns helpful for earning more profits and expand businesses. From the past few years, a lot of research works have been done by using Big Data techniques on educational data for improvement in Education System. Machine Learning and Big Data can be useful for predicting the students' admission, performance of teaching, performance of a student, identifying the group of students of similar behavior. However, the manual process of record checking is time consuming, tedious, and error prone; due to the inherent volume and complexity of data. In this study, the combination of linear and non-linear machine learning algorithms; Logistic Regression, Decision Tree, k-NN, and Naïve Bayes have been chosen to perform prediction of the target class for an unseen observation by polling. As the models built in this work are predicting the likelihood of a student taking up the admission into any university based on the student data collected by any marketing agency, the combined models are collectively called as the Admission Predictor. The administrative officials of any academic institution can use this kind of an application to explore and analyze the patterns that are affecting the student admission and come up with enhanced strategies to improve admission. Such an application not only plays a vital role in administration, but also help the management in reformulating the marketing criteria for overall development of academic institution [11].

### 12. ***Existing Solution -*** *Higher Education Prediction System**:***

At the time of admission all the work is done by manually by ink and paper, that is very slow and much time and effort consuming. Students' admission is one of the most important activities in education industry. A poor and slower admission system can mean fewer students being admitted into abroad universities because they don't have proper source to do the process. This project aims for automated system, pre checking the inclusions of all required data and automatically listing each student based on their application. The data used by the system is stored by database that will be center of all information. This enables things to be simplified and considerably quick, making it easier. It supports the current process but centralized it and make it possible for abroad universities [12].

### 13. ***Existing Solution -*** *University Recommendation and Admission Prediction System**:***

University and college admission is a complex decision process that goes beyond simply matching test scores and admission requirements. For an aspiring graduate student, choosing which universities to apply to is really a difficult problem. Often, the students wonder if their profile is good enough for a certain university. In this project, this problem has been addressed by modeling a recommender system based on various classification algorithms. The required data was obtained from thegradcafe.com. Based on this data set, various models were trained and one best and some other similar properties carrying universities are suggested for the students such that it maximizes the chances of a student getting an admit from that university list. Classification algorithms have also been used to predict the acceptance chance of any student on any individual university.

To predict the best University for the particular student his/her GPA score, GRE (Verbal and Quant) Score, TOEFL score has been used as attributes for classification. K nearest neighbor has been used to predict best University and K means clustering has been used to find more similar universities. Support Vector Machine and Random Forest has been used to predict the admission chance of particular student on specific University [13].

14. ***Existing Solution -*** *A Predictive Model for Graduate Application to Enrollment**:***

This study involved an investigation of factors that affect a graduate applicant in accepting an offer of admission and enrolling in a graduate program of study at a mid-sized public university. A predictive model was developed, using Decision Tree methodology to assess the probability that an admitted student would enroll in the program during the semester following acceptance. The study included actual application information such as demographic information, distance from the campus, program of interest, tests scores, financial aid, and other pertinent application items of over 4600 graduate applications over a three-year period. The Decision Tree model was then compared with a Bayesian Network model to reaffirm its validity and its predictive power. The method with the more promising outcome was used to develop predictive models for applicants interested in a sample of academic majors. The results of the predictive models were used to illustrate development of recruitment strategies for all applicants as well as for those interested in specific majors [14].

15. ***Existing Solution -*** *Engineering & Technology Admission Analysis and Prediction**:***

A Great career without a Great Education is just a DREAM. While we talk about career – a person's degree, specialization, College/University and the knowledge that he possesses – are the key factors. In India the educational pattern is 10+2+3+2 or 10+2+4+2 or 10+2+5.5 & career related decisions are discussed after 10th standard and mostly concluded after 12th. As soon as a student completes his/her Higher Secondary Schooling, the first goal of any student is to get into an appropriate College/University for appropriate course/program so that he can get a better education, guidance & placement for his future. To build predictive model we used Logistic Regression, K Nearest Neighbors', Decision Tree Classifier, Random Forest Classifier, Naive Bayes & Support Vector Machine classifiers then compare the results of cross-validation with & without feature engineering and also compare the probabilities of getting admission to a college. The performance of various classifiers is described in this paper. It is found that Random Forest & Decision tree classifiers give better accuracy [15].

## ***Based on the Previous Researches the Approach to the Project is:***

They have done an exceptional job with their project to manage inventory. But that is not still efficient enough to predict the eligibility for the candidates applying for the colleges / universities. The project will be using the additional support of the tool "IBM Watson" to train the model that is going to analyze the data of the marks entered by the students, which

will make a more human prediction for the project. The Data Science method of collecting the details from the user will be made, where the details will be then analyzed by the list of universities that are available for the particular candidate. The set of universities will be shortlisted and will be displayed in the form of a graph for the candidate on what to choose and the probability of getting any particular colleges. The model is trained with the IBM Watson which will be automatically predict the possibilities. Machine Learning algorithms will be used to train the model which makes it predict the possibilities of the candidate select the list of colleges predicted by the model.

The changes that have made a different and a better approach than the current project, that is:

1. To calculate marks of the students on the number of different exams they have taken for applying for the colleges.

2. To predict the possibility based on the different scores, for example., some colleges / universities might be expecting candidates with the score of GATE exam to give a priority for that score of the students. So, this will be displayed in a different setup where besides the display of the regular college eligibility this will also be shown.

3. To include all the colleges that are present in the state and if necessary for the development of the project, the state enrollment of the colleges will be moved to the national level, to help the students of various states look for the suitable candidates.

4. The project will be easy to use with a more comfortable and efficient user interface to use for everyone visiting the web page, and it will be having a good efficiency in predicting the college for the students.

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