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ENGINEERING COLLEGE SEAT PREDICTION USING MACHINE LEARNING

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ABSTRACT

The rapid advancements in technology and data analytics have enabled predictive modelling to play a crucial role in various domains, including education. Engineering seat prediction is a data-driven approach that leverages historical admission trends, student performance metrics, reservation policies, and other relevant factors to estimate a student's chances of securing a seat in an engineering college. This predictive system aims to assist students in making informed decisions about their preferred institutions and courses, thereby reducing uncertainty and anxiety during the admission process.

1. INTRODUCTION

The rapid advancements in technology and data-driven decision-making have transformed various industries, including education. With an increasing number of students competing for engineering seats in prestigious institutions, the admission process has become more complex and uncertain. Traditionally, students rely on cutoff trends, expert counselling, and personal intuition to make admission-related decisions. However, these methods are often imprecise, as they do not consider real-time variations in competition, reservation policies, and institutional preferences. To address these challenges, engineering seat prediction using machine learning and data analytics offers an innovative solution that enhances transparency and provides students with accurate insights into their admission prospects.

2. LITERATURE REVIEW

The prediction of engineering seat allocation using machine learning and data analytics is an emerging area of research that integrates predictive modelling with educational counselling. Various studies have explored the role of artificial intelligence, statistical analysis, and computational techniques in improving admission processes. This chapter reviews existing literature in the field, analysing past research on seat prediction models, machine learning applications in education, and the impact of predictive analytics on decision-making.

2.1 Predictive Analytics in Educational Admissions

Predictive analytics has been widely applied in the education sector to assist

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students, educators, and policymakers in making informed decisions. According to a study by Romero and Ventura (2020), predictive models have been used to analyse student performance, forecast dropout rates, and optimize admission procedures. Their research emphasized that machine learning techniques, such as regression analysis and decision trees, can be effectively used to predict student success and admission probabilities.

2.2. Machine Learning Algorithms for Admission Prediction

Several machine learning algorithms have been implemented to predict admission probabilities based on students' entrance exam scores, academic performance, and institutional preferences. Research by Patel and Prajapati (2019) compared multiple predictive models, including logistic regression, decision trees, support vector machines (SVM), and artificial neural networks (ANNs), for student admission forecasting. Their results indicated that decision trees provided high accuracy in classification tasks, while neural networks performed better in complex, nonlinear datasets.

3. PROPOSED SYSTEM:

The proposed Engineering Seat Prediction System aims to provide students with accurate and data driven predictions regarding their chances of securing admission to engineering institutions. Unlike traditional methods that rely on static cutoff trends and manual counselling, this system leverages machine learning and data analytics to offer real-time and personalized recommendations based on various factors.

Features of the proposed system

- Uses machine learning models to predict admission chances based on historical data, entrance exam scores, reservation categories, and seat availability.
- Provides a user-friendly interface where students can input their scores and preferences to get a list of potential colleges.
- Incorporates real-time updates on cutoff trends, policy changes, and admission statistics to enhance accuracy.
- Supports multi-platform accessibility, including web and mobile applications, for easy student access.
- Offers personalized recommendations by analysing individual student profiles and comparing them with past admission trends.
- Ensures data security and privacy by encrypting user information and complying with data protection regulations.
- Enables continuous improvement through model retraining using new data and user feedback.

3.2 SYSTEM REQUIREMENTS

The system was built using Python 3.12.0 due to its extensive machine learning ecosystem. The hardware and software requirements for implementing this system are as follows:

Hardware Requirements:

- Intel Core i3 processor or higher
- Minimum 4 GB RAM
- 40 GB free storage

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- 1024x768 display resolution or better.

Software Requirements:

- Operating System: Windows 10 / Linux
- Python Libraries: pandas, numpy, sklearn, matplotlib

IDE: Jupyter Notebook or Visual Studio Code

4. RESULTS

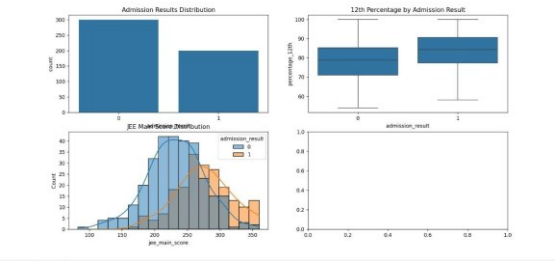

Fig: Admission Results Distribution

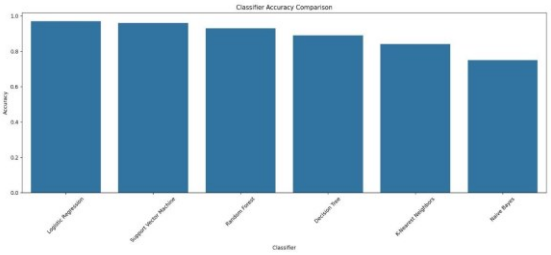

Fig: Classifier Accuracy Comparison

CONCLUSION

The Engineering Seat Prediction System provides a data-driven approach to helping students make informed decisions regarding their college admissions. By utilizing machine learning algorithms and predictive analytics, the system offers accurate and real-time predictions based on factors such as entrance exam scores, reservation categories, past cutoff trends, and seat availability. This reduces uncertainty, enhances transparency, and assists students in making well-informed choices regarding their preferred institutions.

Traditional methods of predicting engineering admissions rely on static cutoffs and subjective decision-making, which can often lead to confusion and miscalculations. The proposed system addresses these challenges by automating the process and providing personalized recommendations tailored to each student's profile. Through an intuitive interface, students can access meaningful insights that guide them in selecting the most suitable colleges based on their eligibility and preferences.

Additionally, the system benefits not only students but also educational institutions and policymakers by improving seat allocation management and optimizing admission processes. The ability to adapt to policy changes and integrate new data ensures that the system remains relevant and effective over time.

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