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Admission Fortune Using Machine Learning & Designing an Interactive Chatbot for Educational Assistance

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Abstract: The proposed system is a Student Admission Rank-Based College Selection Prediction platform that aims to assist students in making well-informed decisions about their college applications. It is a predictive model that uses machine learning algorithms to estimate the likelihood of a student's admission to different colleges based on their academic performance and the admission criteria of those colleges. The proposed system is expected to empower students by providing them with valuable insights into their chances of admission to different colleges. Students can use this information to strategize their college applications and increase their likelihood of acceptance to colleges that align with their academic aspirations and preferences.
Keywords: Application, Admissions Committee, Admission Requirements, Test Scores

I. LITERATURE SURVEY

1) Analysis of Data Prediction Generate by Admission Student Application using Least Square Method
Irfan Fadil; Muhammad Agreindra Helmiawan
The number of applicants entering each department at STMIK Sumedang has increased and decreased from year to year. The data can be used to gain knowledge and learning by searching for stored patterns. One of them is to predict the number of registrants in the following year. STMIK Sumedang doesn't have that system yet. Objectives This study aims to apply and analyze the accuracy of the least square method to predict the number of prospective students. This method is very suitable to be used to predict the magnitude of variables in time series.

2) Admission options and their implications for student desertion at the National University of Engineering
Carlos Ponce-Sanchez; Laberiano Andrade-Arenas
The National University of Engineering (UNI), in the process of assigning vacancies, handled the concept of admission options that allowed those who could not enter in the first time to have a priority, according to their final grade, and be able to compete with their peers to enter in a second, third, fourth and, in some cases, up to the eigth time to the university. The registration system accepted this type of logic supported by the Admission Regulation.

3) GALGOBOT – The College Companion Chatbot
Saksham Saraswat; Siddhartha Mishra
College Campuses are huge in terms of the area they cover. If a certain person has a query that he wants to enquire, he/she would have to travel to various departments gathering segments of the answer to the query he had. The proposed system, GALGOBOT eases the query solving process by saving time and effort. GALGOBOT, a chatbot system acts as a companion and can be integrated on college websites. A Login and Signup System webpages was also added in the system to prevent unknown users from gathering inside information.

4) Comparison study of Regression Models for the prediction of post-Graduation admissions using Machine Learning Techniques
Naveen S. Sapare; Sahana M. Beelagi
In today's technological world, a student's graduate performance plays a vital role in building either a net worthy career or opting different university for master's studies. One simple wrong decision made while Shortlisting University without the knowledge of university ranking by a student can ruin an entire year of hard work and success. A poor university choice may conflict with the student's inner gift and talent, wasting invested time and can cause confusion in choosing the right path and directions.

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Especially the student who is opting for a master's degree based on their GRE/TOFEL score face real difficulty in choosing different research-based universities that need a high score in these exams.

5) Prediction of Graduate Admission using Multiple Supervised Machine Learning Models
Zain Bitar; Amjed Al-Mousa
In response to the highly competitive job market at present times, an increased interest in graduate studies has arisen. This has not only burdened applicants but also led to an increased workload on admission faculty members of universities. Any chance of abridging the admission process impelled applicants and faculty workers to look for faster, efficient, and more accurate methods for predicting admissions. The goal approach of this paper is to implement and compare several supervised predictive analysis methods on a labeled dataset based on real applications from the prestigious university of UCLA; Regression, classification, and Ensemble methods are all the supervised methods that are to be employed for prediction.

6) Evaluating a Learned Admission-Prediction Model as a Replacement for Standardized Tests in College Admissions.
Hansol Lee, Thorsten Joachims, Thorsten Joachims
A growing number of college applications has presented an annual challenge for college admissions in the United States. Admission offices have historically relied on standardized test scores to organize large applicant pools into viable subsets for review. However, this approach may be subject to bias in test scores and selection bias in test-taking with recent trends toward test-optional admission

II. METHODOLOGY

Define the criteria and requirements that applicants must meet to be eligible for admission. Define the criteria and requirements that applicants must meet to be eligible for admission. Admissions committees or staff members review each application to ensure that it is complete and meets the established criteria. In some cases, there may be a pre-screening process to filter out applicants who do not meet minimum requirements, such as GPA or test scores.
Many institutions use a holistic review process, considering not only academic qualifications but also other factors such as extracurricular activities, personal statements, and letters of recommendation. Some institutions conduct interviews with applicants to assess their qualifications, goals, and fit with the institution.
Consider the scores from standardized tests like the SAT, ACT, GRE, or TOEFL as part of the evaluation process. Review letters of recommendation from teachers, professors, or other individuals who can vouch for the applicant's qualifications. Review letters of recommendation from teachers, professors, or other individuals who can vouch for the applicant's qualifications.
Admissions committees or staff members make decisions on each applicant, including whether to offer admission, place on a waitlist, or deny admission. If applicable, manage the waitlist and offer admission to waitlisted applicants if spots become available.
Send official acceptance letters to admitted students, outlining next steps for enrollment. Assess and award financial aid packages to eligible students, including scholarships, grants, loans, and work-study programs. Provide information and support to admitted students to facilitate their enrollment in the institution, including orientation programs.
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Analyze admission data and demographics to evaluate the effectiveness of the admission process and make improvements.

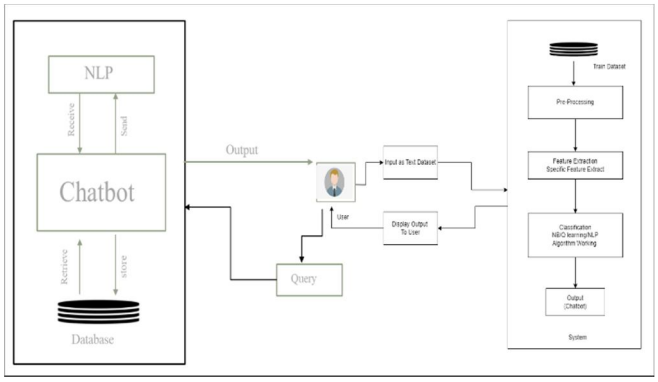


Fig 2.1. Naïve Bayes Working Steps

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III. ANALYSIS

Measure the accuracy, precision, recall, and F1-score of the machine learning model to evaluate its predictive capabilities. Gather feedback from users regarding the chatbot's responses and user experience. Regularly evaluate the machine learning model's performance using new data to ensure it remains accurate and relevant. Monitor system resource utilization to ensure the application is scalable and can handle increased user loads. Ensure the system complies with relevant data protection laws and regulations. Regular updates and improvements based on analysis results will ensure the system remains accurate, user-friendly, and valuable to its users.

IV. PROBLEM STATEMENT

To address these challenges, the objective is to develop a comprehensive solution that combines machine learning techniques for predicting the admission likelihood of students based on various factors and an interactive chatbot for providing educational assistance and guidance to prospective students.

V. OBJECTIVES

This paper is aimed to develop predictive models to forecast the admission outcomes for top-ranking students.
To identify relevant features that significantly impact the admission process.
To design an interactive chatbot to assist students with educational inquiries and admission-related questions.
To create an intuitive and user-friendly interface for the chatbot and prediction system.

VI. ALOGORITHM DETATILS

A. Q Learning

Q-learning is model-free, meaning it does not require a model of the environment's dynamics.
It can handle deterministic or stochastic environments.
It converges to the optimal policy under certain conditions, such as a finite state and action space and sufficient exploration.
Q-learning can be extended to handle continuous state and action spaces using function approximation techniques, like Deep Q-Networks (DQNs), which use neural networks to estimate Q-values.
It is suitable for problems with discrete state and action spaces, such as grid-world navigation or some games.
Q-learning is a reinforcement learning algorithm used for solving Markov decision processes (MDPs). It's a model-free, off-policy algorithm that helps an agent learn the optimal action-selection policy by estimating the value of each state-action pair.

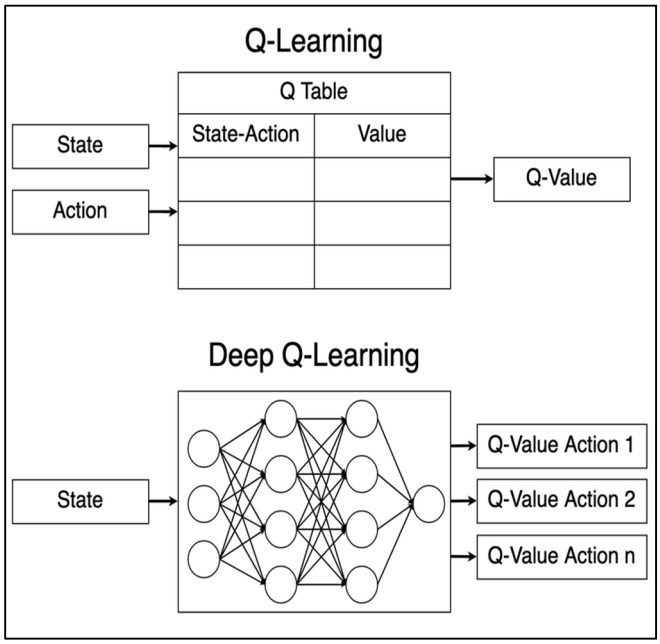


Fig 5.1. Q-learning Working Steps

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B. Naïve Bayes

Naive Bayes is a simple yet powerful classification algorithm, especially suited for situations where the independence assumption is reasonable or when computational efficiency is crucial. However, it may not perform well in cases where dependencies between features significantly impact the classification decision. Naive Bayes is a simple yet powerful classification algorithm, especially suited for situations where the independence assumption is reasonable or when computational efficiency is crucial. However, it may not perform well in cases where dependencies between features significantly impact the classification decision.

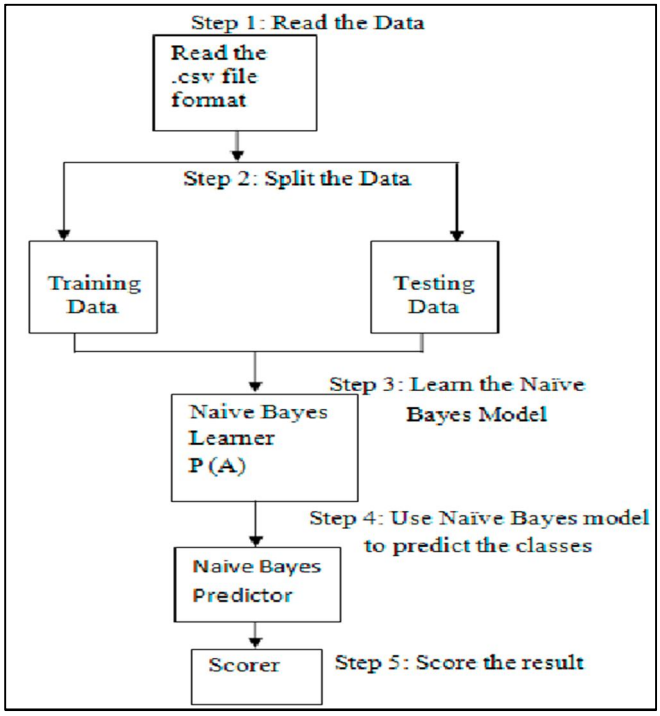


Fig 5.2. Naïve Bayes Working Steps

C. NLP

Naive Bayes is a simple yet powerful classification algorithm, especially suited for situations where the independence assumption is reasonable or when computational efficiency is crucial. However, it may not perform well in cases where dependencies between features significantly impact the classification decision.

NLP involves the analysis of textual data, which can include tasks such as text classification, sentiment analysis, named entity recognition, and topic modeling. These techniques are used to extract insights and information from large volumes of text. NLP involves the analysis of textual data, which can include tasks such as text classification, sentiment analysis, named entity recognition, and topic modeling. These techniques are used to extract insights and information from large volumes of text.

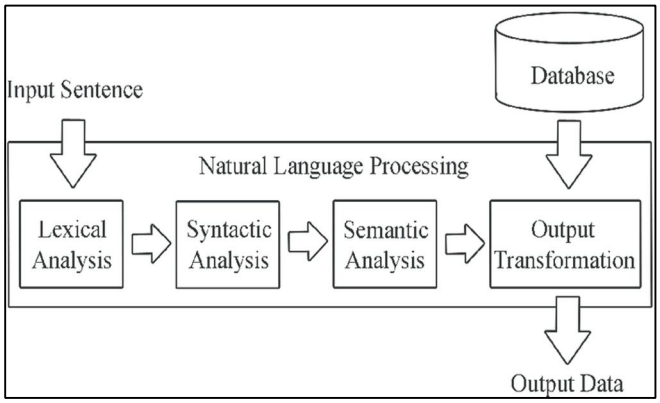


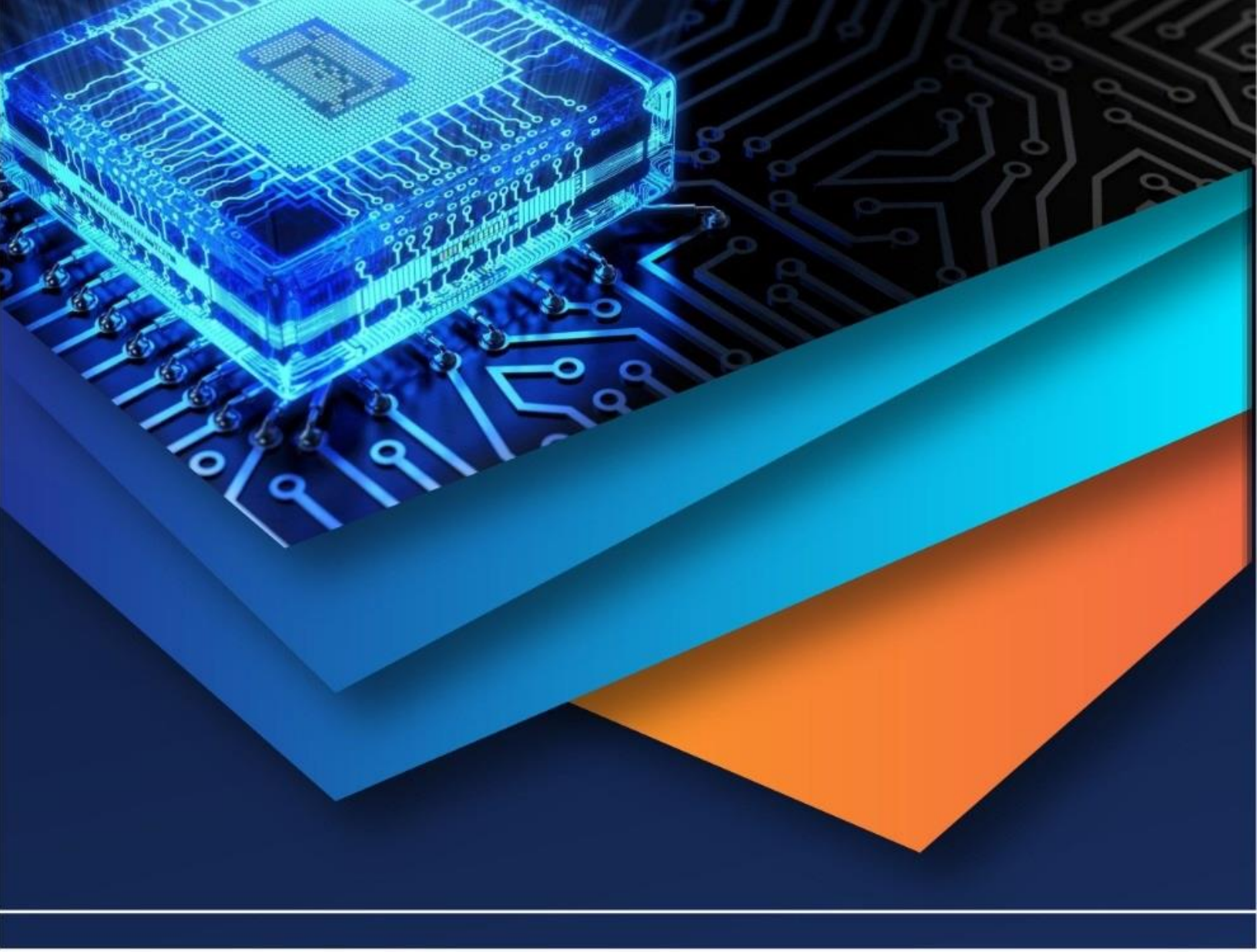
Fig 5.3. NLP Working Steps

VII. CONCLUSION

In conclusion, the student admission process is a critical and multifaceted procedure undertaken by educational institutions to select and admit individuals into their programs. This process is guided by a set of well-defined criteria and methodologies to ensure that the most qualified and suitable candidates are admitted. Educational institutions establish specific admission criteria that applicants must meet. These criteria can include academic qualifications, standardized test scores, letters of recommendation, personal statements, and more. Many institutions aim to create diverse and inclusive student populations. Some applicants may be evaluated based on their contributions to diversity and inclusion, as well as their experiences and perspectives. Many institutions aim to create diverse and inclusive student populations. Some applicants may be evaluated based on their contributions to diversity and inclusion, as well as their experiences and perspectives.

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