

College Admission Prediction System

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ABSTRACT

Choosing the right college and branch during the admission process is one of the toughest decisions for students. Many are unsure about which colleges they qualify for, their chances of getting into a specific department, and whether a college will offer good placements and career opportunities. This project, College Admission Prediction System, aims to help students make informed choices by predicting possible college options and providing useful insights.

The system works in several steps. First, students enter their academic details, such as PCM marks, to check their eligibility for engineering programs. Once eligibility is confirmed, students provide their percentile score. Based on this score, the system compares the student's data with the last two to three years of CAP round seat allotment records to predict a list of colleges in Sangli District where the student may have a chance of admission. It then shows key details like college name, institute code, address, available departments, cutoff ranges, and the likelihood of gaining admission in each branch.

The project GUI is developed using HTML, CSS, and Django, scikit-learn implements machine learning models for cutoff prediction, and MySQL manages the database. With additional insights like placement statistics, this system not only predicts admission chances but also assists students in making more confident, data-driven choices about their college preferences.

KEYWORDS: *College Admission Prediction, Machine Learning, Django Framework, MySQL Database, Data Preprocessing*

INTRODUCTION

The process of getting admitted to a good college is a significant decision in a student's academic journey. Every year, after the entrance exams and results, students take part in the Centralized Admission Process (CAP) round, where they must choose their preferred colleges and departments. However, students often feel confused and stressed during this time. They may be unsure about which colleges they qualify for, their chances of getting into a specific branch, and whether a certain college will offer good placement opportunities. This confusion can lead to poor choices that may impact their future careers.

Our project, College Admission Prediction System for Sangli District, aims to tackle these challenges by acting as a personal admission counselor. The system uses the student's academic marks (PCM) and percentile as input to predict a list of colleges and departments where they are likely to gain admission. The predictions rely on institute wise each cap round cutoff data from the past two to three years, providing realistic insights into cutoff trends and admission chances. Additionally, the system offers extra features like department-level cutoff ranges, probability of admission, and placement information. This helps students understand where they qualify and decide which college best fits their goals.

The project GUI is being developed using HTML, CSS, and Django. Machine learning models trained on past CAP allotment datasets manage the prediction part. Databases like MySQL hold user login data, college information, and shortlisted preferences. Placement information is tracked manually in tables to ensure reliability. The system also has a shortlisting feature, allowing students to add colleges to a preference list and download it for use during CAP round form filling. By combining data analysis, predictions, and an interactive interface, this project aims to simplify, speed up, and improve the admission process for students in the Sangli district.

OBJECTIVES

1. To check if the student qualifies for engineering admission based on their PCM marks before continuing with the process.

2. To create a list of colleges for the student by reviewing their percentile and comparing it with past CAP round data and cutoff trends from the last 2 to 3 years.
3. To show placement information like average packages and recruiters for each department. This helps students make informed decisions when choosing the right college.

LITERATURE REVIEW

The paper An Automated Prediction Model for College Admission System [1] by Dr. Arunakumari B. N. et al. looks at student confusion during option-entry caused by the challenge of analyzing past cut-off data. The authors created a web-based system that uses past admission data, student rank, and category to recommend suitable colleges and branches. This helps students make better choices. The study is limited to K-CET data and five years of cut-offs, which does not account for sudden changes like the opening of new colleges. Future improvements include incorporating data from other exams, real-time updates, and machine learning to provide more accurate predictions.

The paper Prediction Probability of Getting an Admission into University using Machine Learning [2] introduces a model that assists students in predicting their admission chances using algorithms like Linear Regression and Random Forest. It reduces confusion by providing realistic probabilities. However, it relies on limited data, has a few algorithms, and lacks transparency. In the future, the model can improve with larger datasets, more algorithms, real-time updates, and deployment as a mobile app for better usability. The paper Case Study: Admission Prediction in Engineering and Technology Colleges [3] describes a machine-learning model that predicts admission chances based on student marks and ranks. The Decision Tree Regressor achieved the highest accuracy of 97.53%. The model has a GUI for user convenience. However, it is limited by a small dataset of 1,004 entries and a reliance on past records, which may affect generalization. Future improvements involve expanding the dataset, adding real-time admission data, testing more advanced algorithms, and deploying the system as a web or mobile app for wider access.

The paper Machine Learning Based Prediction Model for College Admission [4] uses machine learning and deep learning to predict admission chances based on past records and student features like CET scores and category. Deep neural networks provide better accuracy than traditional models, benefiting both students and universities. Limitations include

dependence on past data and a lack of real-time updates. Future improvements could include larger datasets, real-time policy changes, more student-specific factors, and mobile/web applications for easier access.

The paper Fair and Transparent Student Admission Prediction [5] targets bias and the lack of transparency in traditional admissions. It proposes a machine learning model that uses various factors beyond just marks or ranks for fairer predictions. The study shows improved accuracy and assists students in understanding their admission chances. Limitations include reliance on a specific dataset and inability to adapt to sudden policy changes. Future work involves testing larger datasets, expanding to more institutions, and enhancing the model's fairness and reliability.

METHODOLOGY

The proposed system is designed to predict suitable colleges for engineering students in Sangli District based on their academic performance and past CAP round cutoff data. It will take student percentiles and category (e.g. General, OBC,SC,ST,etc.) as input. Then, it will compare this data with the last 2 to 3 years of CAP round Cutoff records. This process will create a list of eligible colleges and departments. For each department, the system will show cutoff ranges, chances of admission, and insights. It will also provide placement information in a clear format to help students understand the future prospects of each branch. Students can further narrow down their preferred colleges and download the list for use during the CAP preference filling. The methodology is divided into the following phases:

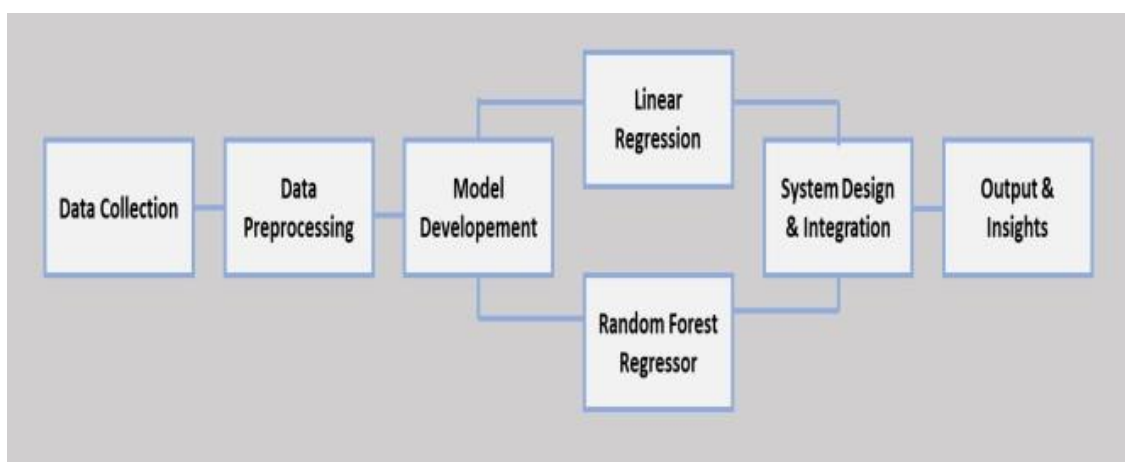


Figure 1: Methodology Flow

Data Collection

Collect the past 2 to 3 years of CAP round seat allotment data. This should include college names, departments, cutoffs, and categories. Gather additional details like college codes, addresses, and placement records.

	A	B	C	D	E	F	G	H
1	Institute_Code	Institute	Departmer	Category	Year	CAP1	CAP2	CAP3
2	6007	Walchand	Civil Engin	GOPENS	2022-23	93.28595	92.99967	92.23465
3	6007	Walchand	Civil Engin	GSCS	2022-23	88.95682	89.87156	
4	6007	Walchand	Civil Engin	GSTS	2022-23	16.57307	41.91398	41.18731
5	6007	Walchand	Civil Engin	GVJS	2022-23	86.83561	82.40696	
6	6007	Walchand	Civil Engin	GNT1S	2022-23	87.57833		
7	6007	Walchand	Civil Engin	GNT2S	2022-23	92.60379		
8	6007	Walchand	Civil Engin	GNT3S	2022-23	89.91924	85.68275	
9	6007	Walchand	Civil Engin	GOBCS	2022-23	91.18647	89.50569	88.33049
10	6007	Walchand	Civil Engin	LOPENS	2022-23	93.303	94.48769	
11	6007	Walchand	Civil Engin	LSCS	2022-23	84.23326		
12	6007	Walchand	Civil Engin	LSTS	2022-23	23.48295		
13	6007	Walchand	Civil Engin	LVJS	2022-23	75.1822		
14	6007	Walchand	Civil Engin	LNT2S	2022-23	85.08806		
15	6007	Walchand	Civil Engin	LOBCS	2022-23	89.13043	91.25642	
16	6007	Walchand	Civil Engin	PWDOPEN	2022-23	32.49927	95.95134	94.90827
17	6007	Walchand	Civil Engin	DEFOPEN	2022-23	74.97		
18	6007	Walchand	Civil Engin	TFWS	2022-23	95.25453	94.48769	94.23831
19	6007	Walchand	Civil Engin	PWDRSCS	2022-23	27.33374		
20	6007	Walchand	Civil Engin	DEFROBCS	2022-23	59.6829		
21	6007	Walchand	Civil Engin	EWS	2022-23	93.97648		
22	6007	Walchand	Computer	GOPENS	2022-23		99.21118	99.19799
23	6007	Walchand	Computer	GSCS	2022-23	96.72708	97.31926	
24	6007	Walchand	Computer	GSTS	2022-23	91.89793	88.6476	84.22346
25	6007	Walchand	Computer	GVJS	2022-23	77.9459		
26	6007	Walchand	Computer	GNT1S	2022-23	94.44628		
27	6007	Walchand	Computer	GNT2S	2022-23	95.08584		
28	6007	Walchand	Computer	GNT3S	2022-23	96.17951	98.07674	97.80658

Figure 2: Admission Prediction CSV Data

Data Preprocessing

Clean the dataset by addressing missing values and standardizing formats, such as percentile ranges and college codes. Organize the data by departments, including CS, IT, Civil, and Mechanical. Transform the dataset into a format suitable for training machine learning models.

Model Development

Train a machine learning model, such as Linear Regression, Random Forest Regressor using past cutoff and percentile data. The model will learn the relationship between a student's percentile and their chance of admission to a specific department at a college. Evaluate the model using accuracy metrics and adjust parameters for better performance.

System Design

Develop the GUI with html, css to create a user-friendly interface for students. Create forms for Login/Registration and Input, which includes Percentile, Marks, Category, and Branch preference. Design output pages to show the predicted college list, eligibility status, placement information, and insights. Add a "Selected College List" section where students can save colleges and download their final list.

Integration

Connect the GUI with the MySQL database to dynamically fetch college and cutoff records. Integrate the trained machine learning model with the GUI so predictions are generated immediately when the student submits their information. Manually add structured placement info to display on the insights page.

Output & Insights

Once the student enters their details, the system will:

- Check eligibility
- Predict and display colleges in the Sangli district that match cutoffs
- Show placement details for different departments
- Allow students to finalize their choices and download their selected college list.

System Architecture Uses past cutoff data, CAP rounds, and student profiles to train machine-learning models like Linear Regression and Random Forest Regressor. It predicts eligibility and likely colleges.

ALGORITHMS

Linear Regression: It is supervised learning algorithm. It is statistical model which defines linear relationship between dependent and one or more independent variables. It assumes variables always have linear relationship. It predicts outcomes by fitting straight line to given data points.

Random Forest Regressor: A random forest is an ensemble learning technique. In regression tasks, we can use Random Forest Regressor for predicting numerical values. It works by creating multiple decision trees and each decision tree is trained on random subset of data. It

process start with method called as Bootstrap Sampling in which it first select random rows of the data to create training set for decision trees after that it uses feature sampling to select random subset features which will be useful for creating decision trees.

CONCLUSION

The proposed College Admission Prediction System effectively uses machine learning techniques to simplify and improve the student admission process. This system provides an interactive platform for students to explore their admission options. It predicts college eligibility based on factors such as percentile, marks, and category, while also reducing manual work and human bias in decision-making.

Overall, the research shows that using AI-driven decision support systems in education can greatly enhance transparency, accessibility, and efficiency in the counseling process.

FUTURE WORK

The current system only uses traditional machine learning algorithms. In future work, we can add deep learning models like Neural Networks to capture complex relationships between student performance and admission trends for better accuracy.

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