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AI Powered CAP Round College Recommendation and Counselling System

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***Abstract*—Selecting the right engineering college and branch through MHT CET CAP rounds is difficult because students need to analyze previous cutoff data and their personal preferences. This paper proposes an AI Powered CAP Round College Recommendation and Counselling System using historical MHT CET cutoff data from 2024, 2025, and 2026. The system considers percentile, category, gender, home university, preferred branch, and preferred location to identify suitable college options. Machine learning algorithms including Decision Tree, Random Forest, and K Nearest Neighbors are used for recommendation and ranking. The system aims to simplify the college selection process and generate a personalized CAP option form based on student preferences and historical admission trends.**

***Index Terms*—MHT CET, CAP Round, College Recommendation, Machine Learning, Random Forest, Decision Tree, KNN, Cutoff Data, Counselling System.**

I. INTRODUCTION

The Centralized Admission Process (CAP) is used for engineering admissions in Maharashtra. Every year, a large number of students compete for seats in different engineering colleges and branches.

During this process, students commonly face difficulties such as understanding previous cutoff trends, selecting suitable colleges, estimating their chances of admission, preparing preference lists, and finding reliable counselling.

At present, many students manually check CAP cutoff PDFs, college websites, videos, and suggestions from friends or seniors. Going through all this information can take a lot of time and may not always provide advice that matches a student's individual situation.

The proposed system uses Artificial Intelligence and Machine Learning to analyse historical admission data and provide recommendations according to the student's profile and preferences.

In this way, the system works like a virtual admission counsellor and helps students throughout the college selection process.

II. PROBLEM STATEMENT

Students taking part in MHT CET CAP rounds often find it difficult to choose the right college and branch. The large amount of cutoff data, category-based seat allocation, changing admission trends, and lack of personalized guidance make the decision more complicated.
Manually analysing this information is time consuming and can sometimes lead to confusion or unsuitable choices. Therefore, there is a need for a system that can analyse admission data and provide students with suitable college recommendations, admission predictions, and counselling support.

III. MOTIVATION

The main motivation for this project comes from the difficulties students experience while selecting colleges during the admission process.
The major reasons behind developing the system are:

- Large amount of CAP cutoff data
- Difficulty in getting personalized guidance
- Uncertainty while selecting colleges
- Time required to manually compare colleges and cutoffs
- Growing use of Artificial Intelligence in education
- The system is intended to make admission guidance easier to access and more useful for students.

IV. AIM AND OBJECTIVES

Aim
The aim of this project is to develop an AI based counselling system that can recommend suitable engineering colleges and help students understand their admission possibilities during CAP rounds.
Objectives

- Develop a centralized platform for admission guidance.
- Use Machine Learning to estimate admission possibilities.
- Recommend colleges according to the student's profile.
- Generate a suitable CAP preference list.
- Provide AI based counselling support.
- Reduce the difficulty involved in college selection.
- Help students make better admission decisions.

V. SCOPE OF THE PROJECT

The proposed system covers the following areas:

- Student profile management
- College recommendation
- Admission probability prediction
- CAP preference list generation
- AI counselling chatbot
- CAP round simulation
- College comparison
- Historical cutoff trend analysis

In the future, the system can also be expanded to support other states and entrance examinations.

VI. EXISTING SYSTEM AND ITS LIMITATIONS

Existing System

- Currently, students mainly depend on:
- CAP cutoff PDFs
- College websites
- Educational forums
- YouTube counselling videos
- Manual counselling services

Limitations

- These methods have several limitations:
- They do not provide recommendations based on an individual student's profile.
- Comparing large amounts of information takes considerable time.
- Manual analysis can lead to human errors.
- Students do not get a clear estimate of their admission chances.
- Preference lists generally have to be prepared manually.
- Professional counselling services may not be affordable for everyone.
- There is limited use of AI based personalized support.

VII. PROPOSED SYSTEM

The proposed system uses Artificial Intelligence and Machine Learning to analyse student information and historical CAP admission data.

The system will:

- Collect student information.

- Analyse previous CAP cutoff data.
- Estimate admission possibilities.
- Recommend suitable colleges and branches.
- Generate a personalized preference list.
- Provide admission guidance through an AI chatbot.
- Allow students to understand different CAP round possibilities.

The goal is to bring the important information required for college selection into one platform instead of making students search through multiple sources.

VIII. PROPOSED METHODOLOGY

Phase 1: Data Collection

The system collects relevant information such as:

- Previous CAP cutoff data
- College information
- Branch details

Phase 2: Data Preprocessing

The collected data is prepared for further analysis by:

- Cleaning the data
- Handling missing values
- Converting categorical information into suitable formats
- Selecting useful features

Phase 3: Model Building

Machine Learning algorithms are used to analyse the processed data. The proposed models include:

- Logistic Regression
- Random Forest
- Gradient Boosting
- XGBoost

The models are used to identify patterns in historical admission data and support the recommendation process.

Phase 4: Recommendation Engine

The recommendation engine groups suitable college choices into:

- Dream Colleges
- Target Colleges
- Safe Colleges

This gives students a clearer idea of the different levels of admission possibilities.

Phase 5: AI Counselling Module
The counselling module provides students with:

- Admission guidance
- Branch recommendations
- Career related guidance

Phase 6: Result Generation
The system displays:

- Recommended colleges
- Admission probabilities
- Suggested preference list

IX. SYSTEM ARCHITECTURE

The main components of the proposed system are:

- User Interface
- Backend Server
- Machine Learning Engine
- Recommendation Module
- AI Chatbot Module
- Database

These components work together to collect student information, process admission data, generate recommendations, and present the results to the student.

X. MODULE DESCRIPTION

Module 1: User Registration and Login
This module manages user authentication and allows students to create their profiles.
Module 2: Student Profile Management
The student's important admission information is stored, including:

- CET Percentile
- Category
- Gender
- Branch Preference
- Location Preference

Module 3: College Database
This module stores important information about colleges, such as:

- College details
- Previous cutoffs
- Placement information

Module 4: Recommendation Engine
The recommendation engine analyses the student's information and generates:

- Safe Colleges
- Target Colleges
- Dream Colleges

Module 5: Admission Predictor
This module estimates the student's admission probability based on the available admission data.
Module 6: Preference Generator
This module creates an organized CAP preference list according to the student's profile and preferences.

Module 7: AI Chatbot
The chatbot provides basic admission counselling and helps students with common questions related to the admission process.

Module 8: College Comparison
This module allows students to compare colleges using factors such as:

- Placements
- Accreditation
- Previous cutoffs

XI. INNOVATION AND NOVELTY

The main features that make the proposed system useful include:

- AI based college recommendations
- Machine Learning based admission prediction
- Personalized counselling through a chatbot
- CAP round simulation
- Dynamic preference list generation
- Dream, Target, and Safe college classification
- Data based support for admission decisions
- The main idea is to bring recommendation, prediction, preference generation, and counselling together in a single platform.

XII. EXPECTED OUTCOME

The proposed system is expected to:

- Make admission planning easier.
- Provide more relevant college recommendations.
- Reduce confusion during college selection.
- Save the student's time.
- Provide personalized guidance.
- Help students make better admission decisions.

XIII. APPLICATIONS

- The system can be useful for:
- Engineering admission guidance
- CAP counselling centres
- Educational institutions
- Career guidance organizations
- Students preparing CAP preference lists

XIV. FUTURE SCOPE

- The system can be improved further by adding:
- A mobile application
- Voice based counselling
- Real time CAP updates
- Support for admissions in multiple states
- Integration with official admission portals
- More advanced AI based career guidance
- Support for English, Marathi, and Hindi

XV. CONCLUSION

The proposed AI Powered CAP Round College Recommendation and Counselling System is intended to make the engineering admission process easier for students. Instead of manually going through a large amount of cutoff information and depending on different sources for guidance, students can use a single platform to explore suitable college and branch options.

By combining historical CAP data, Machine Learning, college recommendations, preference list generation, and counselling support, the system can help students make more informed decisions. The effectiveness of the system will depend on the quality of the data and the performance of the implemented Machine Learning models.

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