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Check College Admission Advisor: A Rule-Based Data Analysis System Using PDF Cut-Off Extraction and Streamlit Interface

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Abstract: *Selecting a suitable college during the admission process is a major challenge for students due to complex eligibility criteria, reservation policies, and continuously changing cut-off trends. Many students rely on manual comparison of admission information collected from multiple sources, which often leads to confusion and inefficient decision-making. This paper presents the design and implementation of a Check College Admission Advisor System that provides structured admission guidance using rule-based data analysis. The proposed system extracts previous year's admission cut-off data from official PDF documents using the Python PDFPlumber library. The extracted data is processed and analyzed using Pandas and NumPy libraries to determine eligibility conditions based on student percentage, category, and preferred academic branch. A user-friendly web interface is developed using Streamlit to allow students to input their academic details and receive suitable college recommendations instantly. The system improves transparency, reduces manual effort, and supports data-driven admission planning. Unlike AI-based predictive systems, the proposed platform focuses on practical analysis of real admission datasets, making it reliable and easy to maintain. Future enhancements may include real-time admission updates and integration with centralized educational portals.*

Keywords: Admission Guidance, Data Analysis, PDF Extraction, Streamlit, Rule-Based System, Educational Technology

1. INTRODUCTION

Higher education admission is an important stage in a student's academic journey, as it directly influences future career opportunities and professional growth. After completing higher secondary education or diploma studies, students are required to select suitable colleges and academic programs based on their academic performance, entrance examination results, reservation category, and personal interests. However, the admission process has become increasingly complex due to the rapid growth of educational institutions, availability of multiple course options, and continuously changing admission cut-off trends. As a result, students often find it difficult to identify colleges where they have realistic chances of admission.

In many cases, students depend on informal sources such as friends, relatives, social media discussions, or local counseling centers to gather admission-related information. Although official websites and admission brochures provide useful data, the information is usually presented in an unstructured manner. Students are required to manually compare previous year cut-off marks, eligibility criteria, and seat availability across multiple institutions. This process requires significant time and effort and may still lead to confusion or incorrect admission decisions. Therefore, there is a strong need for a structured digital platform that can simplify the analysis of admission data and provide clear guidance to students.

The Check College Admission Advisor System is developed to address these challenges by using a data-driven and rule-based approach. Instead of relying on predictive models or complex artificial intelligence techniques, the system focuses on analyzing real admission cut-off data collected from official PDF documents released by educational authorities. By extracting and organizing this data into a structured format, the system enables accurate eligibility filtering based on student percentage, category, and preferred branch of admission. This approach ensures practical and reliable guidance aligned with actual admission trends.

The system also provides an interactive web-based interface developed using Streamlit, which allows students to easily enter their academic details and receive instant college suggestions. The use of Python-based data processing libraries such

as PDFPlumber, Pandas, and NumPy ensures efficient extraction, cleaning, and analysis of admission datasets. By presenting admission recommendations in a clear and user-friendly manner, the platform reduces dependency on manual counseling and helps students make informed academic decisions.

Furthermore, the proposed system contributes to improving transparency and accessibility in the admission process. Students from different geographical regions can access the platform and obtain structured admission guidance without requiring extensive technical knowledge. The modular design of the system also allows future enhancements such as real-time admission updates, integration with centralized admission portals, and development of mobile-based advisory applications. Overall, the Check College Admission Advisor System represents a practical step toward the digital transformation of admission guidance by providing a simple, reliable, and data-oriented decision support solution.

2. LITERATURE SURVEY

The use of digital platforms in higher education admission processes has increased significantly in recent years. Many educational institutions and government authorities provide online admission portals to simplify application submission and information dissemination. These systems allow students to access details such as course availability, eligibility criteria, admission schedules, and institutional guidelines. However, most of these platforms primarily focus on application management rather than assisting students in analyzing their chances of admission. As a result, students are still required to manually interpret previous cut-off trends and compare multiple colleges before making decisions.

Several studies have explored the development of intelligent academic advisory systems that use data processing techniques to support student decision-making. These systems aim to improve transparency and accessibility in admission guidance by organizing large volumes of educational data into structured formats. Web-based counseling tools and centralized information systems have been proposed to reduce the dependency on traditional counseling methods. Such platforms enable students to obtain admission-related information from a single source, thereby reducing the time and effort required to search across multiple websites.

In recent research, artificial intelligence and machine learning techniques have also been applied in educational recommendation systems to predict student performance or suggest academic pathways. While these approaches offer advanced predictive capabilities, they often require extensive datasets, model training, and continuous updates. In practical admission scenarios, especially at regional or institutional levels, rule-based data analysis using actual previous year admission cut-off records can provide more realistic and understandable guidance to students. Systems based on real admission data ensure that recommendations are aligned with official eligibility conditions and historical trends.

Despite the availability of digital admission platforms, there is still a lack of structured decision-support systems that can automatically analyze previous admission cut-off data and generate suitable college suggestions. Students often face confusion due to unorganized information, manual comparison processes, and uncertainty regarding admission possibilities. Therefore, the proposed research focuses on developing a **Check College Admission Advisor System** that extracts admission data from official PDF documents and processes it using Python-based data analysis tools. By presenting filtered and relevant college options through an interactive web interface, the system aims to improve admission planning efficiency and support data-driven academic decision-making.

Another important aspect highlighted in recent studies is the use of data extraction and data processing tools for analyzing educational information available in unstructured formats such as PDF documents, reports, and admission notices. Many admission authorities publish cut-off lists and eligibility details in document form, which makes it difficult for students to directly analyze or compare the data. Researchers have suggested that converting such unstructured data into structured datasets using programming tools can significantly improve accessibility and usability. Python libraries for document parsing and data analysis enable efficient extraction, cleaning, and filtering of admission information. When combined with simple web-based interfaces, such systems can provide practical decision support without requiring complex predictive models. This approach emphasizes transparency, real-world data usage, and ease of system implementation, making it suitable for developing admission advisory platforms that focus on accurate eligibility analysis rather than theoretical prediction.

Identified Problems

Based on surveys, student interactions, and analysis of existing admission guidance systems, the following major problems were identified:

1. **Lack of Personalized Admission Guidance:**
   Many students do not receive proper and customized guidance during the college selection process. Most admission decisions are taken based on assumptions, limited information, or informal advice, which may not reflect actual eligibility conditions.
2. **Scattered Admission Information Sources:**
   Important admission data such as previous year cut-off marks, eligibility criteria, course availability, and institutional requirements are distributed across multiple platforms like college websites, PDFs, brochures, and admission portals. This makes systematic comparison difficult for students.
3. **Dependence on Informal Counseling Methods:**
   Students often rely on suggestions from friends, relatives, coaching centers, or social media discussions. Such sources may provide outdated or inaccurate information, leading to confusion and inappropriate college choices.
4. **Absence of Centralized Structured Admission Platform:**
   There is no single digital platform that collects, organizes, and presents verified admission cut-off data in a structured and easy-to-understand format. This creates difficulties in analyzing realistic admission possibilities.
5. **Difficulty in Understanding Admission Eligibility:**
   Students find it challenging to interpret admission criteria such as percentage requirements, reservation category conditions, and branch-wise cut-off trends without expert assistance.
6. **Time-Consuming Manual Comparison Process:**
   Analyzing multiple college cut-off PDFs and comparing eligibility conditions manually requires significant time and effort, especially during the limited admission period.
7. **Limited Decision-Support Features in Existing Systems:**
   Most current admission portals focus only on application submission or general institutional information and do not provide rule-based eligibility filtering or structured recommendation support.
8. **Lack of Awareness About Suitable Colleges:**
   Due to unorganized admission information and absence of analytical tools, many students remain unaware of colleges where they have realistic chances of admission based on their academic performance and preferences.

Proposed Solution

To address the above problems, an **Intelligent College Admission Advisor System** is being developed.

1. Allow students to enter academic details such as marks, entrance exam scores, category, preferred course, and location preferences.
2. Analyze student data using predefined admission rules and eligibility criteria.
3. Predict suitable colleges and academic programs based on student performance.
4. Display recommended colleges sorted according to eligibility, cut-off trends, and relevance.
5. Provide detailed information about each college, including course availability, fee structure, placement records, and admission requirements.

With this solution, students will no longer need to manually search different websites or depend completely on counseling centers for admission guidance.

All relevant college information and admission suggestions will be available instantly on a single platform based on the student's academic profile.

2.1 Rule-Based College Admission Guidance System [2]

The process of selecting a suitable college and course after completing higher secondary education or entrance examinations is often complex and time-consuming for students. In many cases, students depend on scattered information available on multiple websites, counseling centers, or informal guidance from friends and relatives. This lack of structured and reliable information makes it difficult for them to understand eligibility criteria, compare institutions, and make informed academic decisions. To overcome these challenges, the concept of a **rule-based college admission guidance system** has emerged as an effective digital solution that simplifies the admission process through logical filtering and organized data management.

A rule-based admission guidance system works on predefined conditions and institutional admission rules stored in a centralized database. Instead of using Artificial Intelligence or predictive learning techniques, the system follows a structured approach where students provide inputs such as academic marks, entrance examination scores, preferred stream or course, category, and location preferences. The system then compares these inputs with the eligibility requirements of various colleges and generates a list of institutions where the student is eligible to apply. This logical comparison mechanism helps students quickly identify suitable colleges without manually checking cut-offs and admission criteria from different sources.

One of the major advantages of such systems is their ability to provide accurate and transparent information in a user-friendly digital format. Students can access college details, admission procedures, course availability, and basic eligibility requirements in a single platform. This reduces confusion, saves time, and minimizes the risk of missing important opportunities due to lack of awareness. Additionally, the centralized structure of the system allows educational authorities or administrators to update admission rules, course information, and institutional data efficiently, ensuring that students always receive up-to-date guidance.

Furthermore, rule-based admission guidance platforms contribute to better academic planning by helping students understand their realistic admission options based on their performance and preferences. These systems are particularly beneficial for students from rural or remote areas who may not have easy access to professional counseling services. By digitizing the admission guidance process and presenting information in a structured manner, the system promotes fairness, accessibility, and informed decision-making in higher education admissions.

Overall, the rule-based college admission guidance system represents a practical and technology-supported approach to improving the college selection process. Although it does not use advanced Artificial Intelligence techniques, it effectively streamlines admission guidance through logical rules, organized databases, and automated eligibility checking. Such systems play a significant role in enhancing transparency, reducing uncertainty, and supporting students in making confident academic and career choices.

2.2 Digital Transformation in Educational Admission Support Systems

In recent years, digital transformation has significantly influenced the education sector, particularly in the area of admission guidance and student support services. The increasing number of higher education institutions, courses, and admission procedures has made it difficult for students to gather accurate information and make suitable academic choices. This study focuses on the role of digital technologies in improving admission support systems and simplifying the college selection process through structured online platforms.

The research highlights how web-based admission guidance systems help students access centralized information related to college eligibility criteria, course availability, admission schedules, and institutional requirements. Unlike traditional counseling methods that rely heavily on manual guidance and fragmented sources of information, digital platforms provide an integrated environment where students can enter their academic details and receive filtered results based on predefined rules and logical comparison mechanisms. The data for this study was collected through analysis of existing online admission portals, student feedback surveys, and review of current digital education support tools.

The results indicate that digital admission support systems improve transparency, accessibility, and efficiency in the admission process. Students are able to compare multiple colleges in a short period, understand their eligibility status, and plan their academic journey more effectively. The structured presentation of admission-related data reduces confusion and helps students avoid incorrect decisions caused by misinformation or lack of guidance. Furthermore, the study shows that centralized digital systems assist educational institutions in managing large volumes of admission queries and applications more systematically.

The findings of this research contribute to the development of technology-driven educational services by emphasizing the importance of user-friendly digital platforms in academic decision-making. Such systems provide valuable support not only to students but also to institutions and counseling organizations by streamlining the admission workflow and enhancing communication between stakeholders. Overall, digital transformation in admission guidance plays a crucial role in promoting efficient, transparent, and accessible higher education opportunities for students.

2.3 Development of an Online College Admission Guidance Platform

With the increasing use of digital technologies in the education sector, online admission guidance platforms have become essential tools for helping students select suitable colleges and courses. Many students face difficulties in understanding eligibility criteria, comparing institutions, and accessing reliable admission information due to the availability of scattered data across multiple sources. To address this issue, a rule-based online admission guidance platform can be developed to provide structured and centralized information to students. Such a system allows users to enter their academic details, entrance examination scores, and course preferences, and then processes this information using predefined institutional admission rules to generate a list of eligible colleges. This approach improves transparency, reduces the time required for manual comparison, and supports better academic decision-making. Furthermore, the platform enhances accessibility for students from different regions by providing a simple, user-friendly interface and organized admission data. Overall, the development of an online admission guidance system contributes to efficient admission management, minimizes confusion during college selection, and promotes technology-supported educational planning.

2.4 Research Gap

From the review of existing studies and digital admission guidance platforms, it is observed that many systems focus mainly on providing general admission information or rely on advanced technologies such as Artificial Intelligence and predictive analytics. However, these approaches often increase system complexity, require large datasets, and may not always be practical or accessible for all educational institutions and students. Additionally, several existing platforms present admission data in a scattered or less structured format, which still creates confusion during college selection. There is a lack of simple, rule-based admission guidance systems that can efficiently check student eligibility using predefined institutional criteria and provide clear, filtered college recommendations on a single platform. Moreover, limited attention has been given to designing user-friendly digital solutions that can be easily implemented without high technical requirements while still improving transparency and decision-making in the admission process. Therefore, there is a need to develop a structured, database-driven admission guidance system that simplifies college selection, reduces dependency on manual counseling, and supports students in making informed academic choices.

3. Proposed Methodology

The proposed system is designed as a rule-based online college admission guidance platform that helps students identify suitable colleges based on their academic eligibility. The methodology focuses on collecting student input data such as marks obtained in qualifying examinations, entrance examination scores, preferred courses, and location preferences. This information is processed using predefined admission rules stored in a centralized database containing details of various colleges, courses, and eligibility criteria. The system performs logical filtering and comparison to generate a list of colleges where the student is eligible to apply. The platform also provides additional features such as college information display, course details, and basic admission guidelines to support student decision-making. The development process includes database design, user interface implementation, rule-based logic integration, and testing to ensure accurate results and user-friendly operation. This structured methodology aims to simplify the admission process, reduce manual effort, and improve transparency in college selection through an efficient digital solution.

4. System Architecture

The system architecture of the proposed rule-based college admission guidance platform is designed to provide a structured and efficient mechanism for checking student eligibility and displaying suitable college options. The architecture mainly consists of three major components: the user interface layer, the application processing layer, and the database layer. The user interface allows students to register, log in, and enter their academic details such as marks, entrance examination scores, preferred courses, and location preferences. This information is then transferred to the application layer, where rule-based logical processing is performed. The system compares the student's input data with predefined admission rules and eligibility criteria stored in the centralized database. Based on this comparison, the system generates filtered results and displays a list of eligible colleges along with relevant information such as course availability and admission requirements. The database layer plays an important role in storing institutional details, eligibility conditions, and user records in an organized manner. This layered architecture ensures smooth data flow, easy system maintenance, and improved performance. It also enhances system reliability and transparency by providing accurate admission guidance through structured digital processing.

In addition to the layered structure, the system architecture also emphasizes efficient data management and smooth interaction between different modules of the platform. The user interface module is responsible for collecting accurate input from students and presenting the eligibility results in a clear and understandable format. The processing module handles rule execution, data validation, and result generation by applying predefined logical conditions on the stored admission data. Proper connectivity between the application layer and the database ensures that updated college information and eligibility criteria are retrieved quickly, which improves the overall performance of the system. Moreover, the architecture is designed in a modular manner so that new colleges, courses, or admission rules can be added easily without affecting existing system functionality. This flexibility enhances system scalability and maintainability, making the platform suitable for handling a large number of users during peak admission periods. Overall, the structured system architecture supports reliable operation, faster response time, and effective digital guidance for students during the college selection process.

4.1 Architecture Diagram of Online College Eligibility System:

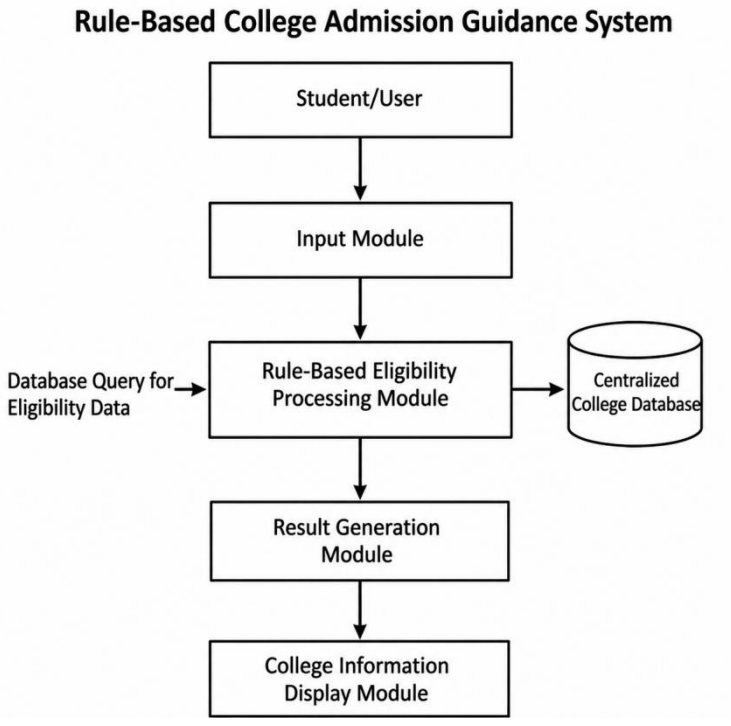


Figure 4.1: System Architecture of Rule-Based College Admission Guidance System

4.2 : Level-0 Data Flow Diagram of Rule-Based College Admission Guidance System

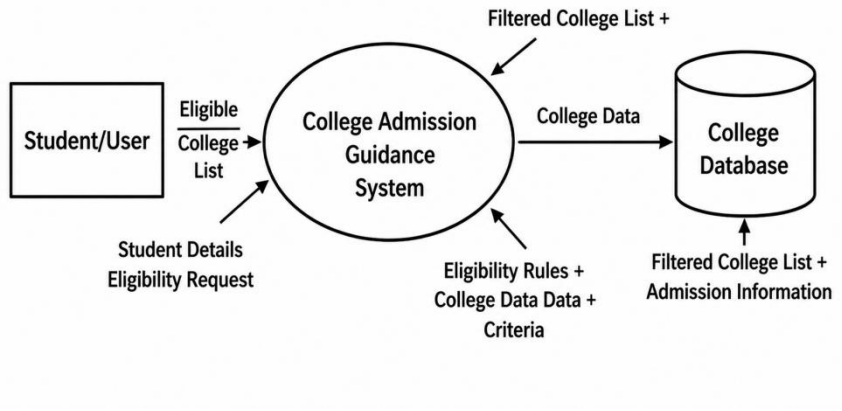


Figure 4.2: Level-0 Data Flow Diagram of Rule-Based College Admission Guidance System

4.3 : Level-1 Data Flow Diagram of Rule-Based College Admission Guidance System

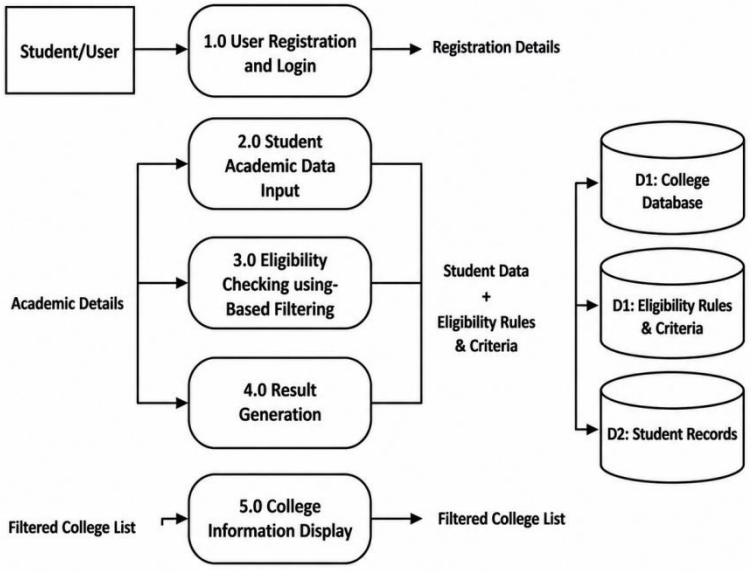


Figure 4.3: Level-1 Data Flow Diagram of Rule-Based College Admission Guidance System

5. Implementation

The implementation of the proposed rule-based college admission guidance system focuses on developing a user-friendly and efficient digital platform that assists students in checking their college eligibility. The system is implemented using web-based technologies that support data collection, processing, and result generation in a structured manner. Initially, a centralized database is created to store information about colleges, courses, admission eligibility criteria, and user details. The front-end interface is designed to allow students to easily register, log in, and enter their academic information such as marks, entrance examination scores, preferred stream, and location preferences.

The core functionality of the system is developed using rule-based logical conditions that compare the student's input data with the stored eligibility rules of different institutions. Based on this comparison, the system generates a list of colleges where the student meets the admission requirements. Additional features such as college information display, course details, and basic admission guidelines are also implemented to support student decision-making. Proper testing is carried out to ensure system accuracy, usability, and reliability. Overall, the implementation phase ensures that the proposed platform operates smoothly and provides effective digital admission guidance to students in a simple and transparent manner.

Step 1: Filter Criteria Input Interface

The system provides a filter criteria panel where the user enters admission-related details such as cutoff percentage, category, and preferred engineering branch. This interface is designed to collect accurate academic and preference data from the student. The cutoff percentage field allows users to specify their obtained score, while the category selection helps in applying category-wise admission rules. The preferred branch dropdown enables students to choose their desired course for eligibility checking.

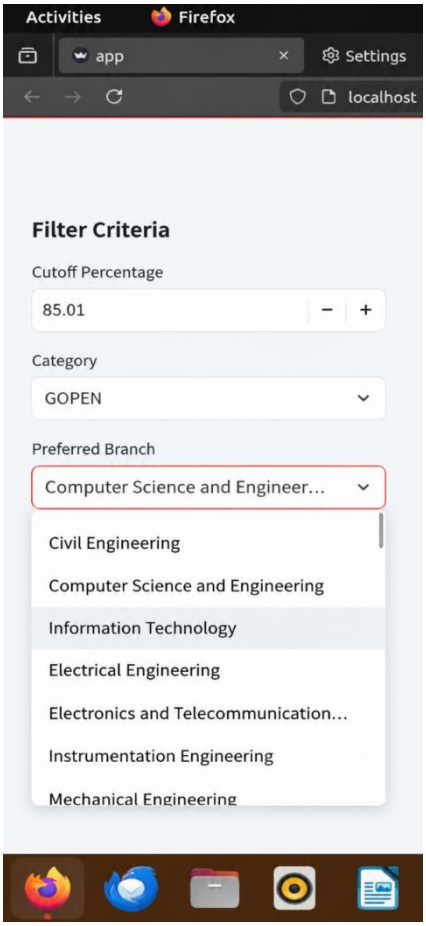


Figure 5.1: Filter Criteria Input Interface for College Eligibility Checking

Step 2: Selection of Course Preference

After entering the cutoff percentage and category, the user selects the preferred engineering branch from the dropdown list. The system dynamically updates the filtering conditions based on the selected course. This step ensures that only relevant colleges offering the chosen branch are considered during eligibility checking.

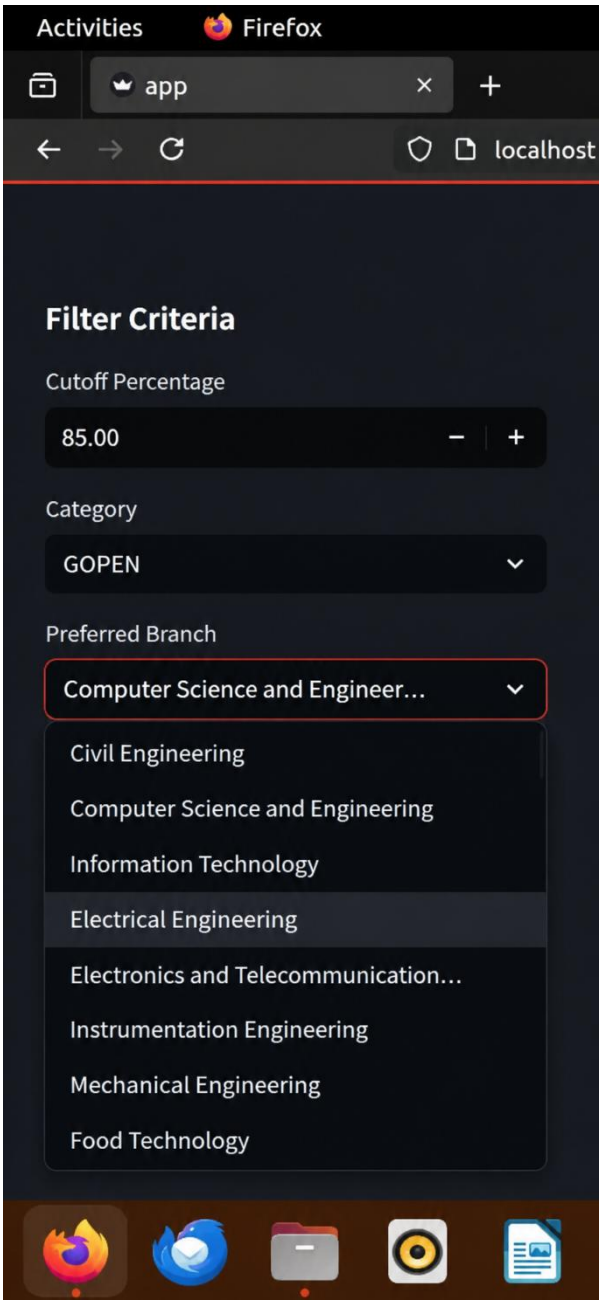
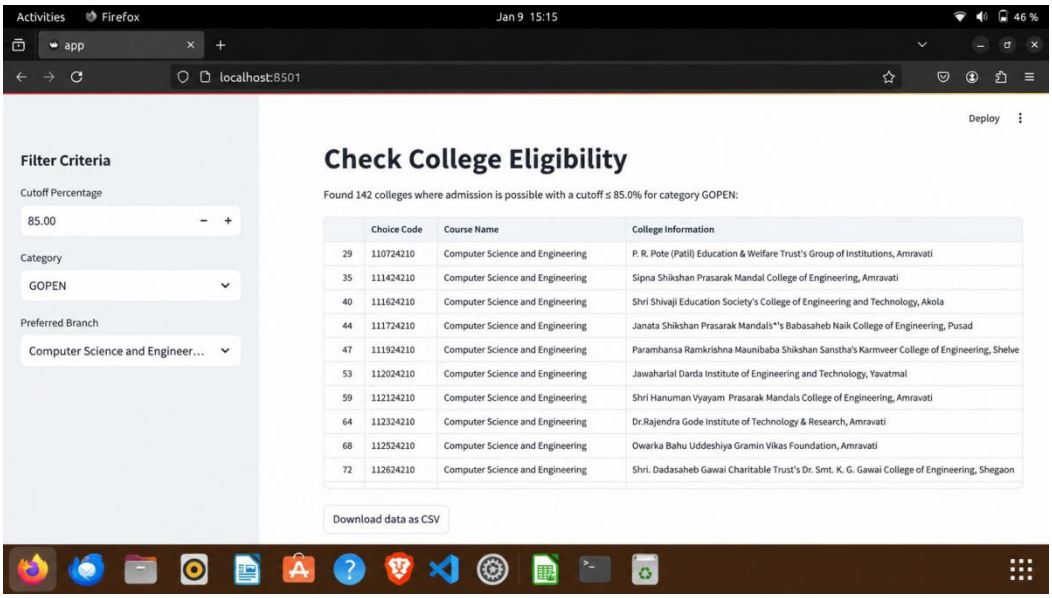


Figure 5.2: Filter Criteria Module Showing Branch Selection Options

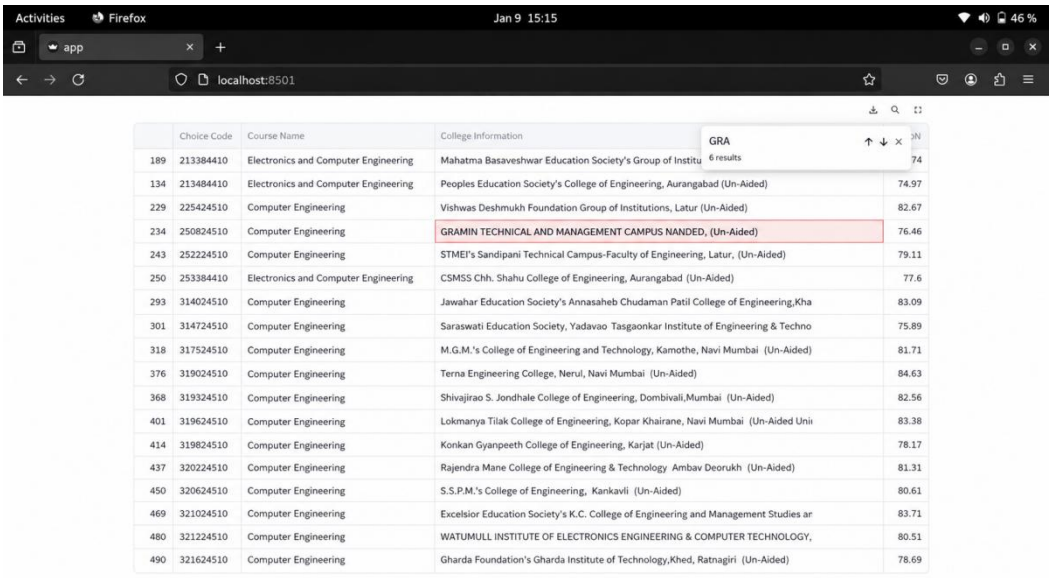
Step 4: Result Generation and Display

After processing the input data, the system generates a filtered list of eligible colleges. In the tested scenario, the system identified **142 colleges** where admission is possible for the selected cutoff percentage and category. The results are displayed in a tabular format containing details such as choice code, course name, college information, and cutoff values. This structured result presentation supports students in comparing institutions and making informed admission decisions.



	Choice Code	Course Name	College Information
29	110724210	Computer Science and Engineering	P. R. Pote (Patil) Education & Welfare Trust's Group of Institutions, Amravati
35	111424210	Computer Science and Engineering	Sipna Shikshan Prasarak Mandal College of Engineering, Amravati
40	111624210	Computer Science and Engineering	Shri Shivaji Education Society's College of Engineering and Technology, Akola
44	111724210	Computer Science and Engineering	Janata Shikshan Prasarak Mandali*'s Babasaheb Naik College of Engineering, Pusad
47	111924210	Computer Science and Engineering	Paramhansa Ramkrishna Maunibaba Shikshan Sanstha's Karmveer College of Engineering, Shelve
53	112024210	Computer Science and Engineering	Jawaharlal Darda Institute of Engineering and Technology, Yavatmal
59	112124210	Computer Science and Engineering	Shri Hanuman Vyayam Prasarak Mandals College of Engineering, Amravati
64	112324210	Computer Science and Engineering	Dr.Rajendra Gode Institute of Technology & Research, Amravati
68	112524210	Computer Science and Engineering	Owarka Bahu Uddeshiya Gramin Vikas Foundation, Amravati
72	112624210	Computer Science and Engineering	Shri. Dadasaheb Gawai Charitable Trust's Dr. Smt. K. G. Gawai College of Engineering, Shegaon

Figure 5.3: Eligible College List Display After Applying Admission Filter Criteria



	Choice Code	Course Name	College Information	
189	213384410	Electronics and Computer Engineering	Mahatma Basaveshwar Education Society's Group of Institu	74
134	213484410	Electronics and Computer Engineering	Peoples Education Society's College of Engineering, Aurangabad (Un-Aided)	74.97
229	225424510	Computer Engineering	Vishwas Deshmukh Foundation Group of Institutions, Latur (Un-Aided)	82.67
234	250824510	Computer Engineering	GRAMIN TECHNICAL AND MANAGEMENT CAMPUS NANDED, (Un-Aided)	76.46
243	252224510	Computer Engineering	STMEI's Sandipani Technical Campus-Faculty of Engineering, Latur, (Un-Aided)	79.11
250	253384410	Electronics and Computer Engineering	CSMSS Chh. Shahu College of Engineering, Aurangabad (Un-Aided)	77.6
293	314024510	Computer Engineering	Jawahar Education Society's Annasaheb Chudaman Patil College of Engineering,Kha	83.09
301	314724510	Computer Engineering	Saraswati Education Society, Yadavao Tasgaonkar Institute of Engineering & Techno	75.89
318	317524510	Computer Engineering	M.G.M.'s College of Engineering and Technology, Kamothe, Navi Mumbai (Un-Aided)	81.71
376	319024510	Computer Engineering	Terna Engineering College, Nerul, Navi Mumbai (Un-Aided)	84.63
368	319324510	Computer Engineering	Shivajirao S. Jondhale College of Engineering, Dombivali,Mumbai (Un-Aided)	82.56
401	319624510	Computer Engineering	Lokmanya Tilak College of Engineering, Kopar Khairane, Navi Mumbai (Un-Aided Unit	83.38
414	319824510	Computer Engineering	Konkan Gyanpeeth College of Engineering, Karjat (Un-Aided)	78.17
437	320224510	Computer Engineering	Rajendra Mane College of Engineering & Technology Ambav Deorukh (Un-Aided)	81.31
450	320624510	Computer Engineering	S.S.P.M.'s College of Engineering, Kankavli (Un-Aided)	80.61
469	321024510	Computer Engineering	Excelsior Education Society's K.C. College of Engineering and Management Studies ar	83.71
480	321224510	Computer Engineering	WATUMULL INSTITUTE OF ELECTRONICS ENGINEERING & COMPUTER TECHNOLOGY,	80.51
490	321624510	Computer Engineering	Gharda Foundation's Gharda Institute of Technology,Khed, Ratnagiri (Un-Aided)	78.69

Figure 5.4: Admission Eligibility Result Page with Download Option

6.Future Scope

The system can be enhanced by integrating real-time admission data and cutoff updates from official counseling authorities to improve accuracy.

1. A **mobile application version** of the platform can be developed to increase accessibility for students using smartphones.
2. The platform can be expanded to include **more colleges, courses, and universities from different regions** to provide wider admission guidance.
3. Advanced features such as **college comparison tools, admission notifications, and counseling schedule updates** can be added.
4. The system can be improved by integrating **Artificial Intelligence or machine learning techniques** in the future to provide personalized college recommendations.
5. A **student profile tracking and history module** can be implemented to help users monitor their admission possibilities over time.
6. Integration with **online application portals and document verification systems** can make the admission process more automated and efficient.
7. The platform can also include **career guidance, course reviews, and placement statistics** to support better academic decision-making.

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