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AI Driven Personalized Course Recommendation System

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Abstract: In todays world, students have wide range of options relating to number of online courses that they may choose from. The course recommendation system utilizes a student's interested skill and chosen level to suggest the top 5 courses best suited to their proficiency. By analysing the student's level, the system employs algorithms to match the student with courses that align with their skill set and learning objectives. This personalized approach enhances the learning experience by ensuring students engage with content appropriate to their expertise, fostering both comprehension and advancement. It helps the student to choose the elective subjects and collects user feedback for enhancing user experience.

Keywords: online courses, recommender system, feedback, electives.

I. INTRODUCTION

Students often face challenges in selecting courses, relying on verbal recommendations from peers and instructors, which can be overwhelming. Our course recommendation system addresses this by focusing on suggesting the top 5 courses aligned with the student's interests. Using cosine similarity, the system matches student-entered courses to recommend options. Students input their desired course and level, and the system provides registration links for available websites for learning.

Elective courses are integral to colleges and universities, yet traditional methods of selection remain common. Our system revolutionizes this by recommending elective courses based on the student's grade in the current academic term, promoting diverse and personalized talent development. This unique approach sets our system apart. Additionally, it offers feedback on selected courses, enhancing the user experience and improving the system over time.

II.RELATED WORK

Course recommendation System: M.RekhaSundari, G.Shreya, T.Jawaharin International Journal of Computer Applications-2020: The main goal of this research is to create a course recommendation system designed to help students choose appropriate courses according to their preferences and needs. This system utilizes a rule-based classifier that functions based on a series of IF-THEN rules. These rules are formulated from both the attributes of courses and the preferences expressed by students.

Course Recommendation System based on Collaborative filtering Zheng Chen, XueyueLiu,LiShang in International Conference on Big Data and Informatization Education –2020: The primary objective of the study is to create a personalized course recommendation system for users by utilizing collaborative filtering techniques to match them with other users. The experimental findings from assessing the recommendation system are presented in this paper. It talks about the approach's advantages and disadvantages and makes recommendations for potential enhancements for further study.

Course Recommendations In Moocs : Techniques And Evaluation, Varun Sabnis,Tejaswini P D, Dr. Sharvani G S, 3rd IEEE International Conference on Computational Systems and Information Technology for Sustainable Solutions 2018: The core aim of this research is to explore various methodologies for suggesting courses within Massive Open Online Courses (MOOCs), with the goal of enriching users' learning journeys through personalized recommendations. The paper presents a framework for evaluating the effectiveness of diverse recommendation techniques. This framework encompasses metrics such as precision, recall, accuracy, and potentially introduces innovative metrics specifically tailored for the MOOC environment.

KNN and Naïve Bayes for optional Advanced Course Recommendation.Vina Zahrotun Kamila, Eko Sebastian, Rosmasari -faculties at Mulwara University, Indonesia.IEEE2019: The study delves into two prominent machine learning algorithms employed in course recommendation systems: K-Nearest Neighbors (KNN) and Naïve Bayes. These algorithms are favored for their simplicity and efficency in recommendation tasks. KNN, a non-parametric algorithm utilized for both classification and regression, predicts advanced courses that a student might find appealing based on the

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courses taken by similar peers. Conversely, Naïve Bayes operates as a probabilistic classifier, leveraging Bayes' theorem with the assumption of feature independence. In course recommendation, Naïve Bayes computes the probability of a student opting for a specific advanced course considering their prior course selections and other pertinent features.

III.PROPOSED SYSTEM

Selecting academic courses can be a time-consuming process, often requiring extensive independent research by students. Current systems primarily rely on general counseling and human advisors. General counseling involves manual sessions conducted by educational institutions, while human advisors offer expert opinions and suggestions for course selection, both of which are manual and time-consuming.

Our proposed system utilizes cosine similarity to match user preferences with course attributes, providing personalized course recommendations. Through a Flask web interface, users can conveniently input their preferences and receive relevant recommendations in a user-friendly manner. The recommendation engine, acting as the system's core component, processes user inputs, calculates similarity scores, and generates course recommendations based on provided criteria. Ultimately, our system aims to enhance user experience by offering tailored course suggestions that align with individual preferences and requirements.

Key objectives of the proposed system include:

1. Designing an intelligent recommendation system that suggests relevant courses based on a student's academic grades and interests.
2. Incorporating feedback data to continuously refine recommendation algorithms and improve overall system performance.
3. Leveraging adaptive learning technologies to customize course content and delivery to individual student needs.
4. Establishing a feedback loop where students can provide input on the relevance and effectiveness of recommended courses.

IV.METHODOLOGY

1. Problem Definition and Objective Setting: Clearly define the issue you aim to address with your recommendation system. For instance, the goal might be to assist users in discovering courses that align with their skill sets and desired difficulty levels.

2. Data Collection and Preparation: Gather course-related data, encompassing attributes such as course content, covered skills, difficulty levels, and user ratings. Preprocess the data by cleansing, filtering, and formatting it for analysis, which may entail handling missing values, eliminating duplicates, and standardizing formats.

3. Feature Extraction: Determine the pertinent features for representing each course. These features could include covered skills, difficulty levels, course content keywords, etc. Extract and represent these features in an appropriate format, such as vectors.

4. Similarity Computation: Utilize cosine similarity or another suitable measure to compute the similarity between courses based on their feature vectors. If necessary, normalize the feature vectors before computing similarity scores.

5. User Input Management: Develop a user interface, such as a Flask web interface, to enable users to input their skills and preferred difficulty levels. Manage and validate user inputs to ensure they conform to the expected format.

6. Recommendation Generation: Given user inputs (skills and difficulty levels), pinpoint relevant courses from the dataset. Employ the previously calculated similarity scores to rank the courses based on their resemblance to the user's preferences. Filter and present the top-ranked courses as recommendations to the user.

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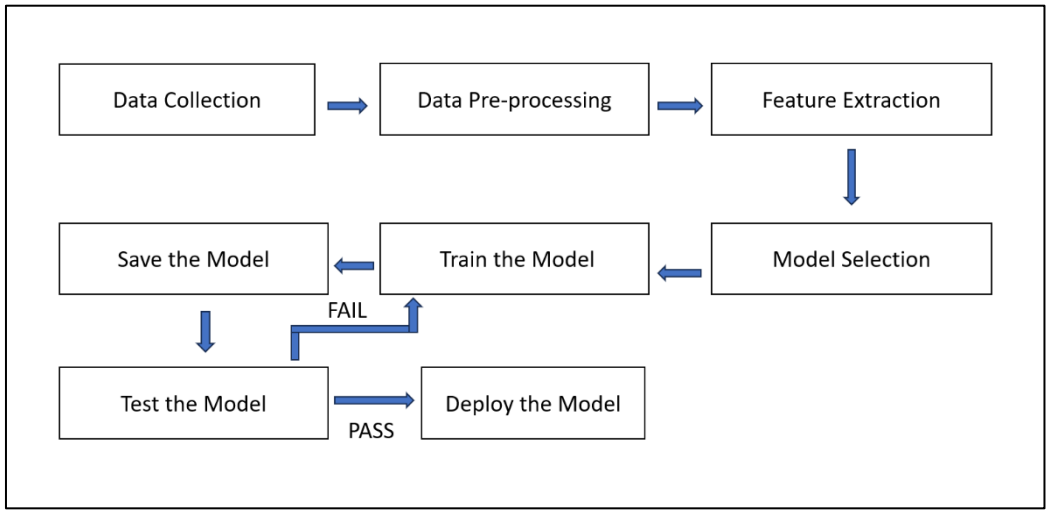

Fig 1. Methodology Steps

V. RESULT AND DISCUSSION

1. Recommendation Accuracy: The course recommendation system excels in suggesting relevant courses based on user-input skills. Through testing, the system consistently identifies courses that match the user's skillset, achieving accurate recommendations.

2. User Satisfaction: The intuitive Flask web app interface, combined with personalized recommendations, contributes significantly to a positive user experience. Users find the interface easy to navigate, and the tailored suggestions enhance their satisfaction.

3. Scalability and Efficiency: The Flask web app demonstrates robust scalability and efficiency in managing user requests, even with a substantial user base and extensive course datasets. Its streamlined querying and retrieval mechanisms ensure rapid response times, thus enriching the overall user experience.

4. Data Quality and Diversity: The effectiveness of the recommendation system hinges on the quality and diversity of the course dataset. Ongoing efforts to update and diversify the dataset with new courses and skill tags are crucial for enhancing the system's capability to provide a broader range of relevant recommendations.

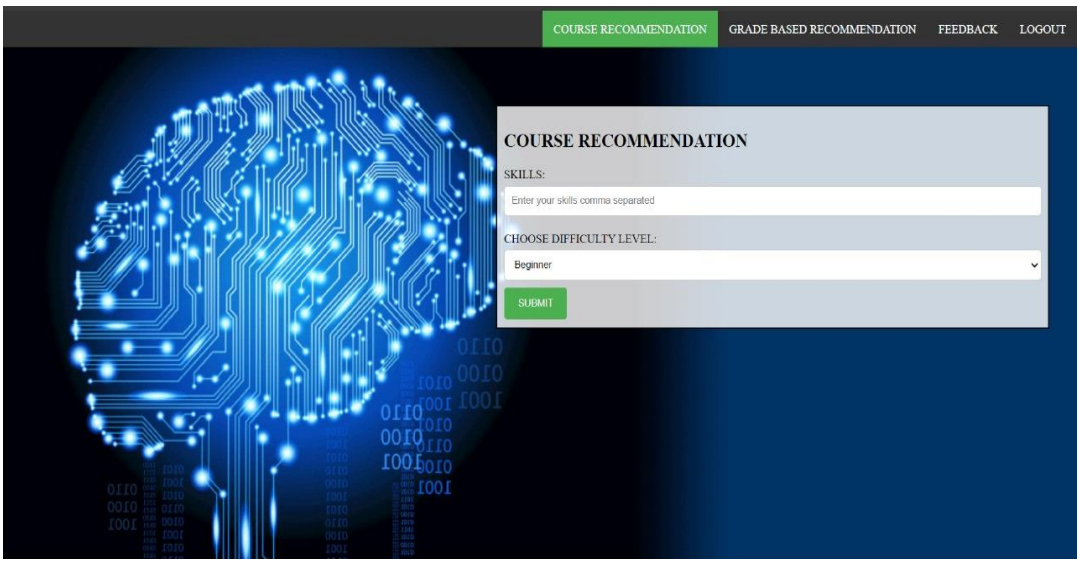

Fig.2 Skill based Recommendation

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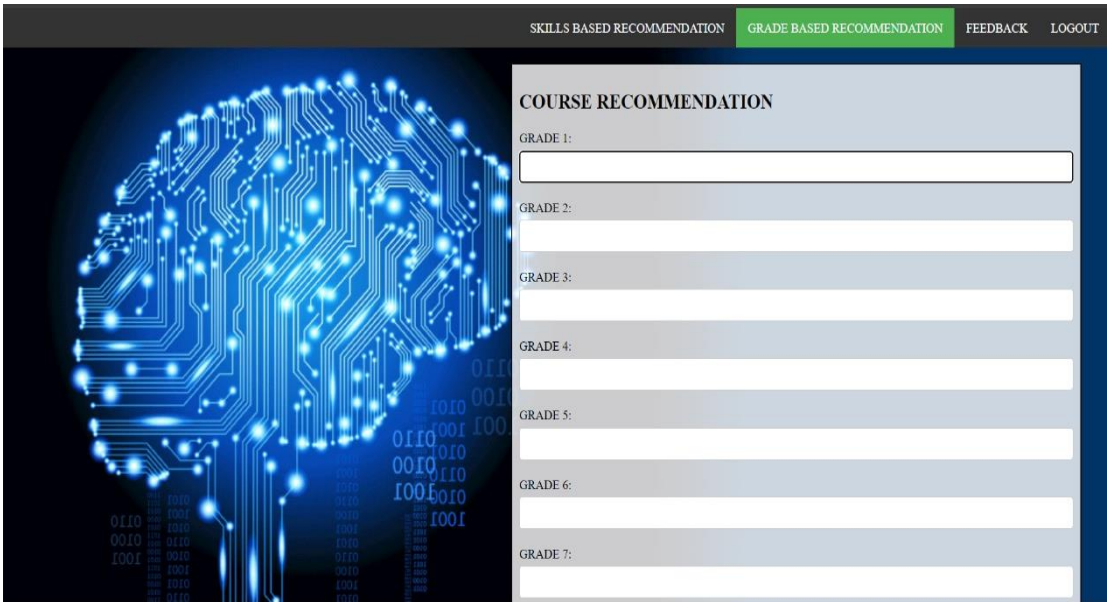

Fig.3 Grade based Recommendation

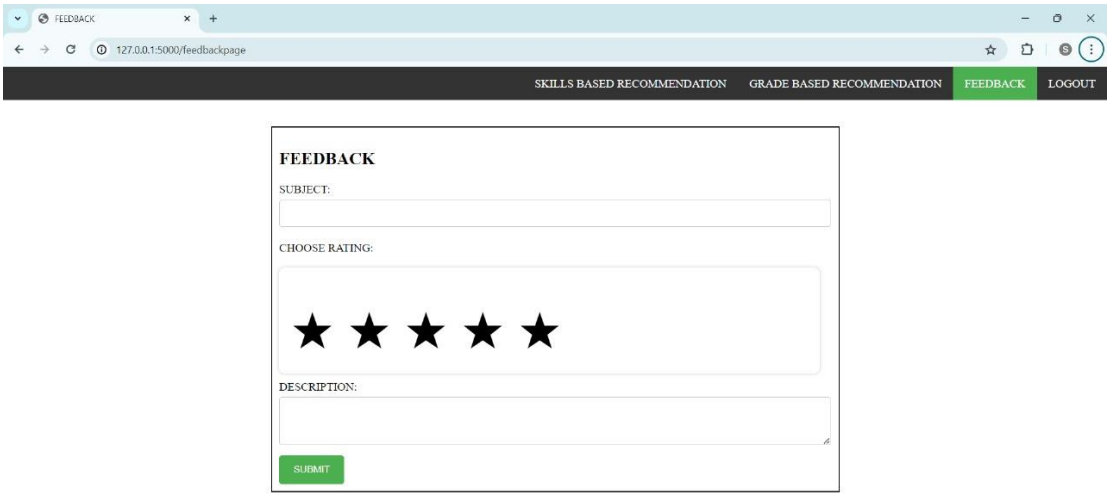

Fig. 4 Feedback Page

VI. CONCLUSION

The proposed course recommendation system represents a significant advancement in the field of personalized learning, offering users a comprehensive and efficient platform for discovering courses and electives tailored to their individual needs. Through its data-driven approach, seamless user experience, and commitment to continuous improvement, the system sets a new standard for course recommendation systems, empowering users to embark on enriching learning journeys with confidence and convenience .

VII. FUTURE SCOPE

Looking ahead, the proposed course recommendation system holds significant potential for future expansion and enhancement. By exploring opportunities to integrate additional features, such as collaborative filtering and machine learning-based algorithms, the system can further refine its recommendation capabilities and cater to a broader user base. Furthermore, the adoption of emerging technologies and innovative approaches will contribute to the system's evolution as a versatile and indispensable tool for online learners worldwide.

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