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Blooms Taxonomy Based Question Paper Generation

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Abstract :- Blooms Taxonomy Based Question Paper Generation system is an innovative approach to revolutionize the conventional process of question paper generation. It addresses the critical need to reduce the time and effort invested in manual paper creation while offering a more efficient and secure data management system. The key feature of this system is its ability to empower users by allowing them to input questions and define their complexity levels. Leveraging advanced machine learning techniques, including SVM and Naive Bayes, the system assigns marks to each question by aligning them with Bloom's Taxonomy. One of the remarkable features is the simplicity and flexibility it provides to administrators. When it comes time to generate a question paper, administrators can effortlessly select the desired percentage of difficulty. The system then takes over, selecting questions randomly, resulting in a customized question paper. This paper can be conveniently converted into a PDF format and emailed directly to examiners. The broad applications of this system encompass educational institutions, including colleges and universities, as well as government exams. By enhancing efficiency and ensuring reliability in the assessment processes, it contributes significantly to the overall educational ecosystem. This project exemplifies a valuable contribution to the domain of educational technology, promising to redefine how question papers are created and managed.

***Key Words*:** Question paper generation, educational technology, machine learning, assessment processes, PDF format, educational institutions, government exams.

1.INTRODUCTION

In the field of education, examinations are instrumental in assessing students' knowledge and abilities. Teachers and educators face the challenge of creating question papers tailored to their institutions, a task that can be time-consuming and prone to human error. Furthermore, the quality of question papers is crucial for accurate evaluation.

This project offers a solution to streamline and automate the manual question paper generation process, leveraging machine learning and Bloom's Taxonomy. It also introduces the feature to generate papers in PDF format to examiners, enhancing accessibility and convenience in assessments.

Background of the Industry:-In education, question papers are pivotal for evaluating student comprehension and skills. Manual paper generation is labor-intensive and prone to errors. It often results in repeated questions across papers, affecting the integrity of assessments.

The project aims to address these issues by providing an automated, efficient method for question paper creation, ensuring accuracy and adherence to educational objectives. The option to email papers to examiners further modernizes and simplifies the assessment process.

2. Literature Survey

The literature survey examines previous studies on automated question paper generation systems, focusing on both proposed and existing systems.

Proposed system:

[1] Bangera Shanika Ashok Shanthi (Year) discusses automated question generation using a genetic algorithm,

emphasizing the shared goal of automation despite differing approaches.
[2] Yulia Timakova (Year) demonstrates the value of incorporating Bloom's Taxonomy in question paper generation, while
[3] Zalte S.V. (Year) provides insights into automated paper generation and avoiding question repetition.

For existing systems:-
[4] Zalte S.V. (Year) serves as a benchmark for traditional methods, highlighting the need for innovation.
[5] Yulia Timakova's (Year) system showcases challenges in manual processes and potential for improvement through automation.
[6] Akhil Killawala (Year) introduces the idea of using computational intelligence for generating quiz questions, emphasizing the significance of automated content creation in educational technology.

3. Problem Definition:
The problem is the time-consuming and labor-intensive process of manually generating question papers for examinations, which often leads to inefficiencies, potential for errors, and limited variety in question types. Additionally, manual processes may result in questions being repeated across multiple exams, compromising the integrity and fairness of assessments. Thus, there is a need for an automated system that can efficiently generate diverse and unique question papers while maintaining quality and relevance to the subject matter

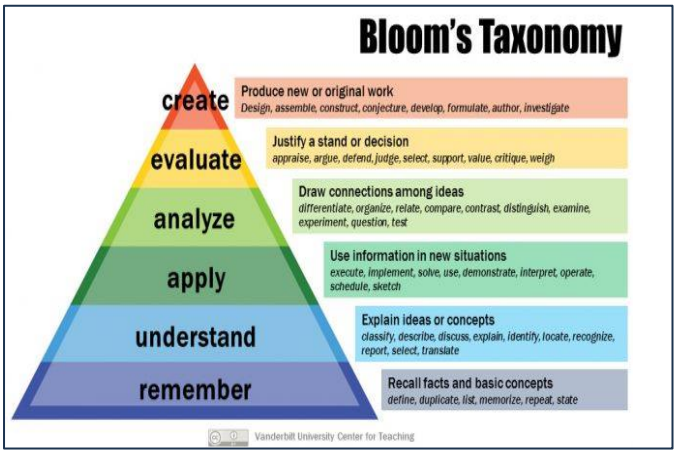


Fig [1] blooms Taxonomy levels

4: Proposed Working:
The proposed system has been trained on a dataset to predict marks and Bloom's levels using linear regression and random forest algorithms. The system can be used to create datasets for different subjects and generate question papers with different difficulty levels. Here's a breakdown of the steps involved:

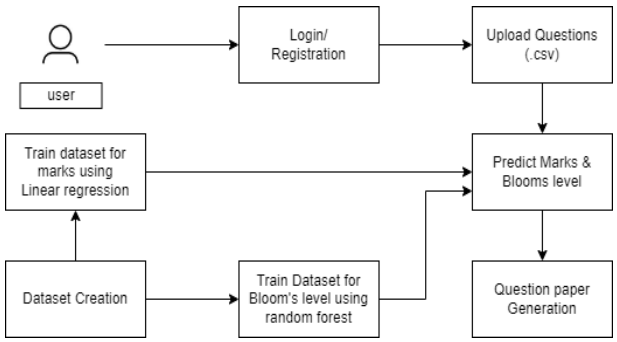
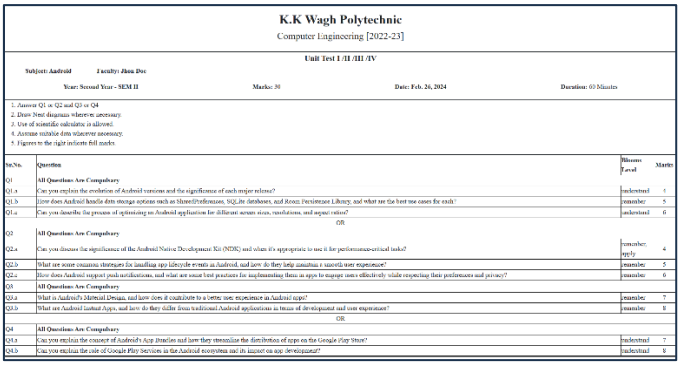


Fig [2] System Working

1.Login/Registration: Users can log in to the system or register as new users.
2.Upload Questions (.CSV): Users can upload question papers in CSV format. The CSV file should contain the questions, their corresponding answers, and the Bloom's level for each question.
3.Dataset Creation: The system creates a dataset from the uploaded question paper. This dataset is then used to train the machine learning models.
4.Train Dataset for Predicting Marks using Linear Regression: The system splits the dataset into training and testing sets. The training set is used to train a linear regression model to predict the marks for each question. The testing set is used to evaluate the performance of the model.
5.Train Dataset for Predicting Bloom's Level using Random Forest: The system splits the dataset into training and testing sets. The training set is used to train a random forest model to predict the Bloom's level for each question. The testing set is used to evaluate the performance of the model.
6.Question Paper Generation: Once the models have been trained, they can be used to generate new question papers. The system can use the linear regression model to predict the marks for each question, and the random forest model to predict the Bloom's level for each question.
5. Result
The result of addressing the problem of manual question paper generation through automation and implementation resulted an efficient and effective automated system. This system is capable of generating diverse and unique question papers for examinations with minimal human intervention. It has streamlined the process, saving time and effort for educators and administrators, while also reducing the likelihood of errors and ensuring the integrity and fairness of assessments. Additionally, the system offers features such as customizable difficulty levels, integration of Bloom's Taxonomy for question categorization, and compatibility with various formats for easy distribution and administration. Overall, the result is an improved and optimized method of question paper generation that enhances the educational assessment process.



K.K Wagh Polytechnic
Computer Engineering [2022-23]

Unit Test I /II /III /IV

Subject: Android Faculty: Jhon Doe

Year: Second Year - SEM II Marks: 30 Date: Feb. 26, 2024 Duration: 60 Minutes

1. Answer Q1 or Q2 and Q3 or Q4
2. Draw Neat diagrams wherever necessary.
3. Use of scientific calculator is allowed.
4. Assume suitable data wherever necessary.
5. Figures to the right indicate full marks

Sr.No.	Question	Bloom's Level	Marks
Q1	All Questions Are Compulsory		
Q1.a	Can you explain the evolution of Android versions and the significance of each major release?	understand	4
Q1.b	How does Android handle data storage options such as SharedPreferences, SQLite database, and Room Persistence Library, and what are the best use cases for each?	remember	5
Q1.c	Can you describe the process of optimizing an Android application for different screen sizes, resolutions, and aspect ratios?	understand	6
	OR		
Q2	All Questions Are Compulsory		
Q2.a	Can you discuss the significance of the Android Native Development Kit (NDK) and when it's appropriate to use it for performance-critical tasks?	remember, apply	4
Q2.b	What are some common strategies for handling app lifecycle events in Android, and how do they help maintain a smooth user experience?	remember	5
Q2.c	How does Android support push notifications, and what are some best practices for implementing them in apps to engage users effectively while respecting their preferences and privacy?	remember	6
Q3	All Questions Are Compulsory		
Q3.a	What is Android's Material Design, and how does it contribute to a better user experience in Android apps?	remember	7
Q3.b	What are Android Instant Apps, and how do they differ from traditional Android applications in terms of development and user experience?	remember	8
	OR		
Q4	All Questions Are Compulsory		
Q4.a	Can you explain the concept of Android's App Bundles and how they streamline the distribution of apps on the Google Play Store?	understand	7
Q4.b	Can you explain the role of Google Play Services in the Android ecosystem and its impact on app development?	understand	8

Fig [3] Output

6.CONCLUSION

In conclusion, the Blooms Taxonomy Based Question Paper Generation system offers a significant advancement in educational technology, streamlining traditional paper creation processes. By using machine learning and aligning questions with Bloom's Taxonomy, it simplifies customization and ensures fairness in assessment. The system's ease of use and automated selection process enhance efficiency and convenience for administrators. With its broad applicability in educational institutions and government exams, it promises to revolutionize assessment practices, contributing to overall educational improvement. In summary, this system represents a valuable innovation, poised to redefine and optimize assessment procedures in diverse educational contexts.

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