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Proctored Exam Tool

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Abstract: In contemporary educational settings, examinations at colleges and universities serve as pivotal assessments for student learning and improvement. Similarly, the surge in online hackathons necessitates robust measures to ensure integrity and fairness. Addressing this need, a proctored exam tool emerges as an imperative solution, aimed at mitigating instances of cheating among students. This tool monitors student actions during examinations, preventing unauthorized activities such as tab-switching or accessing external resources. Moreover, it provides examiners with a secure platform to review submitted results and allocate marks accordingly. In response to this exigency, we have developed a proctored exam tool utilizing Python, Bootstrap, and web APIs. This innovative platform not only safeguards the integrity of examinations but also streamlines the grading process, ensuring a comprehensive and secure assessment environment.

Keywords*:* Python, Bootstrap, API, Proctored

I. INTRODUCTION

The objectives and scopes of this proctored tool are to provide an efficient solution for the given problem statement which covers the following features:

Remote Monitoring: The software should allow proctors to remotely observe the exam-takers via webcam and screen sharing to ensure that no unauthorized assistance is provided during the exam.

Identity Verification: Implement a robust identity verification mechanism to ensure that the exam-taker is the intended participant, preventing impersonation and fraud.

Cheating Prevention: Incorporate advanced monitoring features, such as real-time AI-based facial recognition, eye tracking, and suspicious behavior detection, to identify and flag potential instances of cheating.

Secure Environment: Ensure that the exam environment remains secure by disabling access to unauthorized resources like other applications, websites, or external devices during the examination.

II. LITERATURE REVIEW

Several researchers have explored the development and functionality of online proctoring tools, one notable paper being "An Evaluation of Online Proctoring Tools" by Mohammed Juned Hussein, Javed Yusuf, Arpana Sandhya Deb, Letila Fong, and Som Naidu [1]. In their study, they examine various methods of proctoring, namely live proctoring, recorded proctoring, and automated proctoring. Live and recorded methods entail human oversight to monitor suspicious activities during exams, while automated proctoring utilizes artificial intelligence (AI) for monitoring purposes.

In our research, we extend the capabilities of automated proctoring by introducing additional functionalities. In addition to real-time monitoring, our tool facilitates the evaluation of exam submissions by examiners and maintains a documented record of these evaluations. To achieve this, we employ AI technology, leveraging the Python programming language for implementation.

The process begins with the registration of exam takers, during which their images are captured and stored in a database. Throughout the examination duration, the tool continuously compares the captured images with the exam taker's identity to ensure authentication and prevent unauthorized activities such as tab switching and cheating from internet sources.

Following submission, the tool transitions to the examiner interface, where examiners can review all submissions associated with a specific exam ID. These submissions are securely stored in a database, and additional security measures, such as one-time passwords (OTPs) provided through APIs for registration, are implemented to enhance data protection and integrity.

III. PROBLEM STATEMENT

A solution needs to be designed to address the challenges encountered by institutes or any exam organizing authority in monitoring students' actions to conduct exams in proctored mode.

IV. REQUIREMENTS

1. Hardware- Webcam, Microphone, 4GB ram.
2. Software- Browser, Webserver, Video streaming tool.
3. Technologies: Programming Language (Python), AI, Frontend Frameworks, Database Integration, API.
4. Testing Techniques: Usability testing, Feedback and Assessment, Performance testing, Security and privacy testing.

V. METHODOLOGY

A. Requirement Analysis

1. Identify key features and functionalities needed, including user authentication, exam setup, real-time monitoring, submission evaluation, and result generation.

B. System Design

1. Define functional specifications based on gathered requirements.
2. Design the architecture of the Proctored Exam Tool, outlining components such as user authentication, database management, exam setup, and frontend interface.
3. Select Flask framework for backend development, SQL for database management, and Bootstrap, HTML, and CSS for frontend design.

C. Implementation

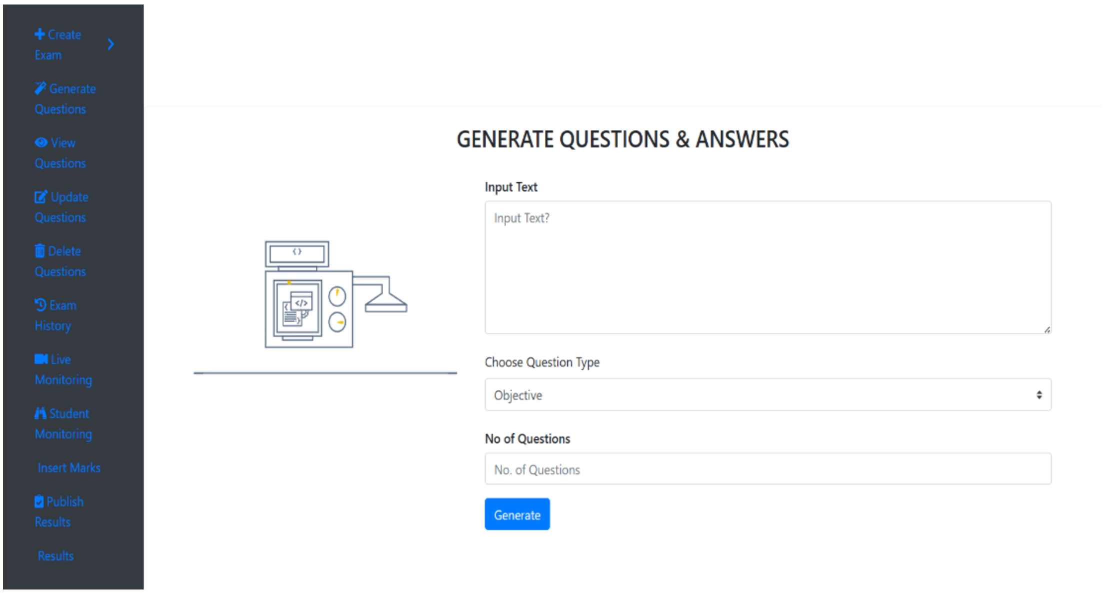
1. Develop the login page with authentication functionality using Flask.
2. Implement user signup functionality for new users.
3. Develop separate login interfaces for examiners and students.
4. Implement functionalities for exam setup by examiners, including setting exam duration, selecting subject mode (subjective or objective), and uploading question papers in CSV format.
5. Develop the mechanism to generate a unique exam ID for each exam setup.
6. Implement security measures to prevent students from taking screenshots or switching tabs during the exam.
7. Develop the submission interface for students to access exams using the exam ID and submit their answers within the specified duration.

D. Testing

1. Conduct unit testing for each module to ensure functionality and reliability.
2. Perform integration testing to verify the interaction between different components.
3. Conduct user acceptance testing (UAT) with examiners and students to validate usability and functionality.
4. Perform security testing to identify and address vulnerabilities in the system.

E. Deployment and Maintenance

1. Provide user training and support for examiners and students.
2. Establish procedures for ongoing maintenance, including bug fixes, updates, and enhancements.
3. Monitor system performance and security, and implement necessary improvements as required.



GENERATE QUESTIONS & ANSWERS

Input Text

Input Text?

Choose Question Type

Objective

No of Questions

No. of Questions

Fig. 1 Examiner Page

VI. CONCLUSION

The conclusion of this project is to implement proctoring measures effectively to minimize suspicious activities during exams, thereby creating a secure environment conducive to fair evaluation. By integrating features such as real-time monitoring and restriction of unauthorized actions, the Proctored Exam Tool aims to deter cheating and maintain academic integrity. Additionally, providing examiners with a streamlined platform for evaluation facilitates efficient assessment processes.

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