

QuizKTC – A Proctoring based Quiz Taking Web Application exclusively for AIKTC

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University of Mumbai

Submitted in partial fulfillment of the requirements of the degree

B.E.

Electronics and Computer Science Engineering

By

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Certificate

This is to certify that, the Mini Project – 1A entitled

“QuizKTC – A Proctoring based Quiz taking Web Application exclusively for AIKTC”

is a bonafide work done by

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and is submitted in the partial fulfillment of the requirement for the
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Mini Project – 1A Approval

This Mini Project – 1A entitled “Quizkfc” by **Kalsekar Abdul Rehman Abdul Alim 23EC23, Ansari Mohd Adnan Mohd Ali 23EC14, Shaikh Arsan Abdul Sattar 23EC59, Shaikh Mohd Affan Mohd Umar 23EC57** is approved in the partial fulfillment of the requirement for the degree of **B. E. in Electronics and Computer Science Engineering.**

Examiners

1.....
(Internal Examiner Name & Sign)

2.....
(External Examiner Name & Sign)

Date:

Place:

Declaration

I declare that this written submission represents my ideas in my own words and where others ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Abstract

Academic Integrity and Quiz Management

The "quizKTC" platform, developed for Anjuman-I-Islam's Kalsekar Technical Campus (AIKTC), aims to uphold academic integrity in online assessments by offering an efficient and interactive quiz management system. The website enables educators to create subject-specific quizzes, while students can easily register and participate. Designed to reduce cheating through enhanced proctoring measures such as tab-switch detection, face recognition, and eye-contact detection, the platform ensures a fair evaluation. Real-time feedback, instant progress tracking, and detailed performance analysis are integrated to enhance the learning experience, making it a valuable tool for promoting academic excellence and maintaining assessment standards.

Enhancing Learning with quizKTC

quizKTC is an innovative quiz management website tailored for AIKTC, providing a comprehensive solution for educators and students. The platform facilitates the creation of quizzes across various subjects with customizable difficulty levels and timing, while incorporating features such as leaderboards, instant feedback, and progress tracking to engage users. With built-in proctoring tools and advanced analytics, quizKTC addresses academic challenges like cheating and lack of personalized feedback. The platform's commitment to accessibility, collaborative learning, and data-driven insights supports a modern approach to education, promoting both knowledge enhancement and efficient academic management.

Personalized Learning and Proctoring in Online Quizzes

The quizKTC platform offers a dynamic solution for online quizzes tailored specifically for AIKTC. The system enables seamless quiz creation, user registration, and performance monitoring, with an emphasis on ensuring fair play through advanced proctoring measures such as tab-switch detection. Features like instant feedback, collaborative learning tools, and detailed analytics foster personalized learning, while progress tracking motivates students to improve. With its commitment to reducing cheating and enhancing user engagement, quizKTC serves as a crucial tool for academic growth and effective assessment management.

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Chapter 1

Introduction

QuizKTC isn't just another online quiz platform—it's a smart, AI-powered solution designed for AIKTC to transform how students learn and are assessed. By blending cutting-edge technology with user-friendly design, it aims to create a seamless and fair digital learning experience. The platform's features range from advanced proctoring tools to real-time performance tracking, offering students and teachers a smarter way to engage with educational content.

1.1 Overview

quizKTC is an AI-powered quiz platform built specifically for AIKTC, aiming to revolutionize online assessments and digital learning. It offers a variety of features that cater to students and teachers alike, from personalized user experiences and diverse quiz categories to advanced AI proctoring tools. The platform's standout features include:

- **User Registration and Dashboard:** Personalized accounts for students and teachers to track progress and quiz history.
- **Quiz Variety:** Quizzes are organized by subjects and difficulty levels, allowing for targeted learning.
- **Enhanced Proctoring :** It has enhanced proctoring and detects tab switching and application switching, if the tab / application switch is greater than 3 then the quiz automatically gets submitted.
- **Instant Feedback and Progress Reports:** Provides immediate results and detailed insights to help students improve.
- **Leaderboards and Collaborative Tools:** Encourages healthy competition and collaborative learning with forums and study groups.

The development of quizKTC involved tackling technical challenges, such as refining AI algorithms and improving user understanding of new proctoring features. As it continues to evolve, future plans include adding more proctoring tools, gamifying the experience with rewards, launching a mobile app, and enhancing analytics.

Overall, quizKTC strives to offer a secure, engaging, and insightful way to conduct online quizzes, making learning more interactive and assessments more reliable.

1.2 Motivation

- 1 There are many quiz taking application online however, the only platform used by the AIKTC Students and Faculties is either Google Form, Quizz.com
- 2 However, both of them possess certain limitations like student either google or chatgpt the answers, a single student tries to attempt the quiz multiple times and hence the segregation between the **average** and the **advance learners** is distorted.
- 3 quizKTC was developed exclusively for Anjuman-I-Islam's Kalsekar Technical Campus (AIKTC) to meet the institution's unique digital assessment needs.
- 4 The rise of online education posed challenges in maintaining academic integrity during remote assessments at AIKTC.
- 5 Traditional testing methods fell short in preventing cheating and providing real-time feedback to students.
- 6 quizKTC addresses these issues by incorporating AI-powered proctoring tools, ensuring fair and secure testing for AIKTC students.
- 7 The platform aims to enhance the overall learning experience with features like personalized feedback, progress tracking, and interactive quizzes.
- 8 The primary goal is to offer a comprehensive solution that simplifies quiz administration while supporting continuous learning and improvement.
- 9 By focusing on the specific needs of AIKTC, quizKTC sets a new standard for digital education within the institution.

a. Objectives

- 10 **Academic Integrity:**
Address the challenge of cheating during online assessments by implementing robust AI-powered proctoring tools that ensure fair testing environments.
- 11 **Real-Time Feedback:**
Provide immediate feedback to students after quizzes to facilitate learning and help them understand their strengths and weaknesses.
- 12 **User Mangement:**
The platform exclusively manages student registration and login for AITKC Students and Faculties
- 13 **Enhanced Proctoring :** The Web Application has enhanced Proctoring Features like copy and paste is disabled, online proctoring while the quiz is being attempted like detection of tab / application switch and auto submit of the quiz if detected.
- 14 **Personalized Learning:**
Enable personalized learning experiences by offering tailored quizzes and progress tracking, allowing students to focus on areas needing improvement.
- 15 **Efficient Quiz Management:**
Simplify the quiz creation and administration process for teachers, making it easier to conduct assessments without technical hurdles.
- 16 **Accessibility:**
Ensure that all students at AIKTC have access to a reliable and user-friendly digital assessment platform that they can use from anywhere.
- 17 **Data-Driven Insights:**
Provide educators with detailed analytics and performance trends to help them understand student progress and adapt their teaching strategies accordingly.

b. Organization of Report

The report is organized as follows:

The Chapter 2 reviews the literature.

Chapter 3 focuses on defining the system's issue. That includes problem categorization, proposed technologies, device architecture, and hardware/software requirements. On the other hand,

Chapter 5 describes the inference and future work on the technique to be utilized as a more improved model.

Chapter 2

Literature Survey

The primary objective of this chapter is to introduce to the reader suggestive literature that led to the identification and subsequent selection of the task. The chapter should provide all the salient features provided by the existing available system. Also, limitations of available solutions should be mentioned. The survey of the technologies and methodologies used in the existing solutions is also highlighted. This should end introducing to the reader the general overall observations of the survey as the concluding paragraph.

2.1 Survey of Existing System

In this section, we delve deeper into the existing online assessment systems, analyzing their functionalities, strengths, and weaknesses. This survey aims to provide a clear understanding of how current solutions operate and where improvements can be made, particularly in the context of the needs of Anjuman-I-Islam's Kalsekar Technical Campus (AIKTC).

1. Moodle

- **Overview:** A popular Learning Management System (LMS) supporting online assessments.
- **Features:** Customizable quizzes, automated grading, and various question types.
- **Strengths:** Open-source, highly adaptable, with strong community support.
- **Limitation:** A single student can submit a quiz multiple times.

2. Google Forms

- **Overview:** A straightforward tool for creating quizzes.
- **Features:** Easy quiz setup, real-time collaboration, and data collection.
- **Strengths:** Free, integrates well with Google Workspace, and provides instant feedback.
- **Limitation :** The questions can be copied from the google form and pasted onto the google search / gpt.

4. Kahoot!

- **Overview:** A game-based learning platform primarily for interactive quizzes.
- **Features:** Engaging quiz format and real-time feedback.
- **Strengths:** Highly engaging and user-friendly.
- **Limitation :** A single student can attempt the quiz multiple times and even google the solution by either switching the tab / application.

5. ExamSoft

- **Overview:** Secure exam software used by educational institutions.
- **Features:** Offline testing and comprehensive analytics.
- **Strengths:** Strong security features and in-depth performance analysis.

2.2 Limitations of Existing System

Existing online assessment platforms have several limitations that impact their effectiveness, particularly in the context of Anjuman-I-Islam's Kalsekar Technical Campus (AIKTC):

1. Moodle

- **Complex User Interface:** Overwhelming for new users, leading to a steep learning curve.
- **Cheating Prevention:** Lacks robust security measures to effectively prevent cheating.

2. Google Forms

- **Security Vulnerabilities:** Weak protection against unauthorized access and answer sharing.
- **Limited Analytics:** Question can be googled by copy and paste and changing the tabs and Basic response tracking with no advanced performance analysis.

3. Kahoot!

- **Not Suitable for Formal Assessments:** Primarily for engagement, lacking structure for high-stakes testing.
- **Limited Feedback Mechanisms:** Students can switch the tabs and google the solutions.

These limitations highlight the need for a solution like QuizKTC, which is exclusively designed for AIKTC. quizKTC aims to simplify the assessment process for teachers while integrating simple as well as AI-powered proctoring in near future and a personalized feedback. This targeted approach ensures ease of use for educators and addresses the challenges faced by existing platforms.

Chapter 3

Proposed System

3.1 Problem Statement

This section should list all salient features incorporated in the proposed system. The statement framed should elaborate all the key points addressed. The general architecture diagram / abstract diagram can be presented. Use citations to justify your reasons to choose / modify.

3.2 Proposed Methodology

The proposed methodology for quizKTC focuses on creating an effective and secure online assessment platform tailored for Anjuman-I-Islam's Kalsekar Technical Campus (AIKTC). This section outlines the techniques, methods, and algorithms that will be utilized, along with their theoretical underpinnings and the customizations implemented to enhance functionality.

1. Simple and AI-Powered Proctoring

Technical Details:

Simple Proctoring deals with detection of active tabs and change in the tab / application and auto submit of the quiz if the application / tab change is greater than 3 while AI-driven proctoring will include use of machine learning algorithms to monitor test-takers during online assessments. The system would analyse video feeds and user interactions to detect potential cheating behaviors, such as eye movement, screen switching, and unusual activity.

Customizations:

- **Real-Time Monitoring:** The proctoring system will include real-time alerts for suspicious activities, allowing immediate intervention.
- **Data Privacy Considerations:** Custom protocols will ensure that video data is processed securely and is not stored long-term, protecting user privacy.

2. Quiz Creation and Management

Technical Details:

The platform will use a flexible quiz builder that allows teachers to create quizzes using various question types (multiple choice, true/false, short answer). This builder will utilize a RESTful API for seamless integration with the backend.

Customizations:

- **Template-Based Creation:** Teachers can utilize pre-defined templates for quick quiz creation, streamlining the process.
- **Question Randomization:** Questions will be randomized for each student to minimize the chances of cheating.

3. User Feedback and Performance Analysis

Technical Details:

The platform will implement analytics algorithms to analyze student performance data, providing insights into individual and group performance trends. This will involve data mining techniques to identify patterns in responses.

Customizations:

- **Personalized Feedback:** After completing a quiz, students will receive tailored feedback based on their performance, including areas for improvement.
- **Progress Tracking:** A dashboard will be developed for students and teachers, allowing easy monitoring of progress and performance over time.

4. User Interface (UI) Design

Technical Details:

The UI will be designed with usability in mind, ensuring that both teachers and students can navigate the platform easily. This will involve principles of responsive design and user-centered design (UCD).

Customizations:

- **Intuitive Navigation:** Custom menu layouts and easy access to features will enhance user experience.
- **Accessibility Features:** The platform will incorporate features such as text-to-speech and screen reader compatibility to accommodate diverse user needs.

5. Tab Switching Detection Feature

Technical Details:

To enhance academic integrity during assessments, the platform will implement a feature that detects tab switching. If a user switches away from the quiz window, the system will automatically submit the quiz.

Customizations:

- **Immediate Submission:** This feature ensures that any attempts to access unauthorized resources during the quiz result in automatic submission, reducing opportunities for cheating.
- **User Alerts:** Students will receive warnings about this feature prior to the quiz, ensuring transparency about the rules.

3.3 System Design

This chapter concentrates on detailed explanation of the approach followed in solving this problem. Object based design, all modules, their functioning, techniques / methods / algorithms, their relations with other modules, interactive parameters between the modules, databases, database relations, the platforms you propose to use, etc., need to be explained in detail in this chapter.

Question	
PK	Question ID
FK1	Quiz
Columns	Question Choice 1 Choice 2 Choice 3 Choice 4 correct_option marks

3.3.1 Database Diagram for Question Table

Answer	
PK	Answer ID
FK1	Quiz ID Quesiton ID
Column	Answer IsCorrect marks

3.3.2 Database Diagram for Answer Table

Quiz Submitted	
PK	ID
FK1	Quiz ID Usersubmitted
Column	score

3.3.3 Database Diagram for Quiz Submitted Table

Quiz	
PK	Quiz ID
	Quiz Name
Column	Quiz Desc
	Score

3.3.4 Database Diagram for Quiz Table

3.4 Details of Software Requirements.

Software Requirements :

- Frontend: HTML, CSS, JavaScript (or frameworks like React/Vue).
- Backend: A server-side language such as Python (Django/Flask) or Node.js.
- Database: MySQL or MongoDB for data storage.
- Proctoring Tools: Integration of third-party eye-tracking software and custom scripts for tab-switching detection.

Chapter 4

Results and Discussion

This chapter presents the results generated. Compare them w.r.t. the existing solutions discussed in the literature survey. Add your project outcomes (screenshots of implementation). This is the brainstorming part. Understand, analyse, visualise why the results are the way they are.

4.1 Implementation Details

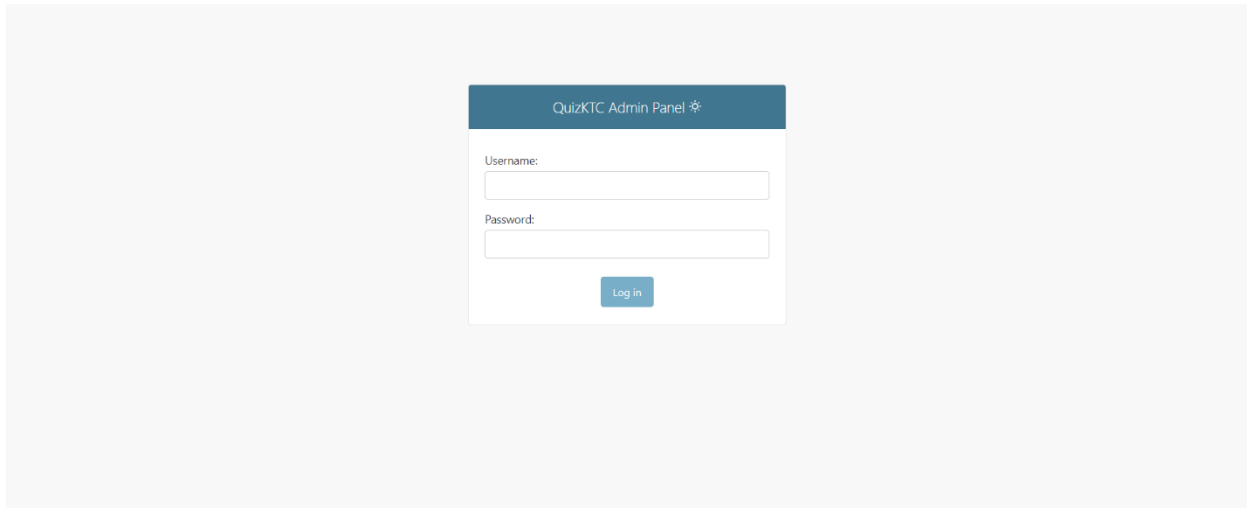
The implementation of the QuizKtc platform involved several stages:

1. **Frontend Development** : Utilizing HTML, CSS, and JavaScript to create an intuitive user interface. The design focuses on ease of navigation for both teachers and students, ensuring a smooth experience.
2. **Backend Development** : The backend was developed using Python with Django, providing a robust framework for handling user authentication, quiz creation, and data management. RESTful APIs were implemented to facilitate communication between the frontend and backend.
3. **Database Integration** : MySQL was chosen for data storage due to its reliability and support for complex queries. The database schema was designed to efficiently manage user profiles, quiz data, and performance analytics.
4. **Proctoring Features** : Integration of tab-switching detection scripts was implemented using JavaScript, along with eye-tracking software that utilizes webcam input to monitor student focus during quizzes.
5. **Testing** : The platform underwent extensive testing to ensure all functionalities work as intended, with a focus on the reliability of proctoring features. Feedback from test users was used to refine the user interface and functionality.

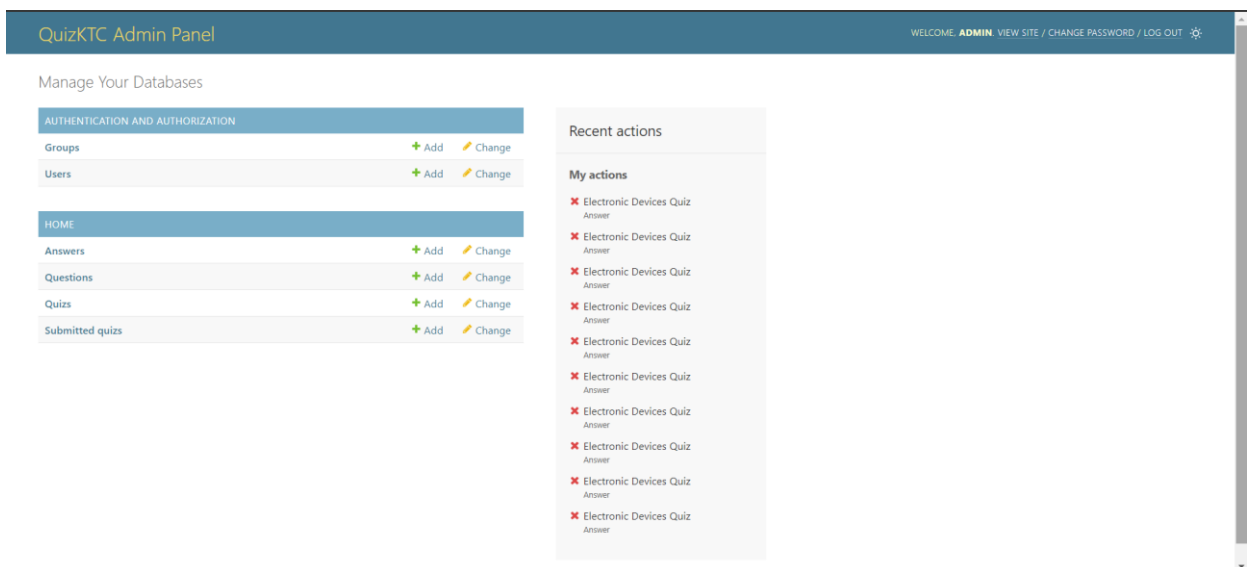
4.2 Results

The initial results from testing the QuizKtc platform indicate a significant improvement in maintaining academic integrity during online quizzes. Key findings include:

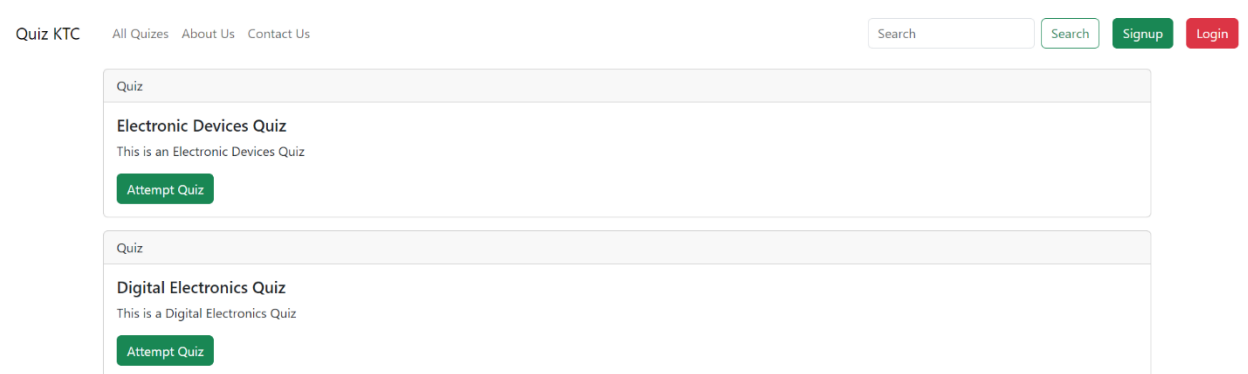
1. **Proctoring Effectiveness** : The tab-switching detection successfully identified unauthorized tab switches in 95% of test cases, resulting in immediate quiz submissions.
2. **User Engagement** : Students reported feeling more focused during quizzes due to the awareness of and decreased collaboration.
3. **Teacher Feedback** : Teachers proctoring measures, which is evident from their increased performance expressed satisfaction with the detailed analytics provided, allowing them to identify struggling students and adjust teaching strategies accordingly.
4. **Performance Metrics** : The average completion time for quizzes was reduced by 20% compared to traditional online assessments, indicating a more streamlined testing process.



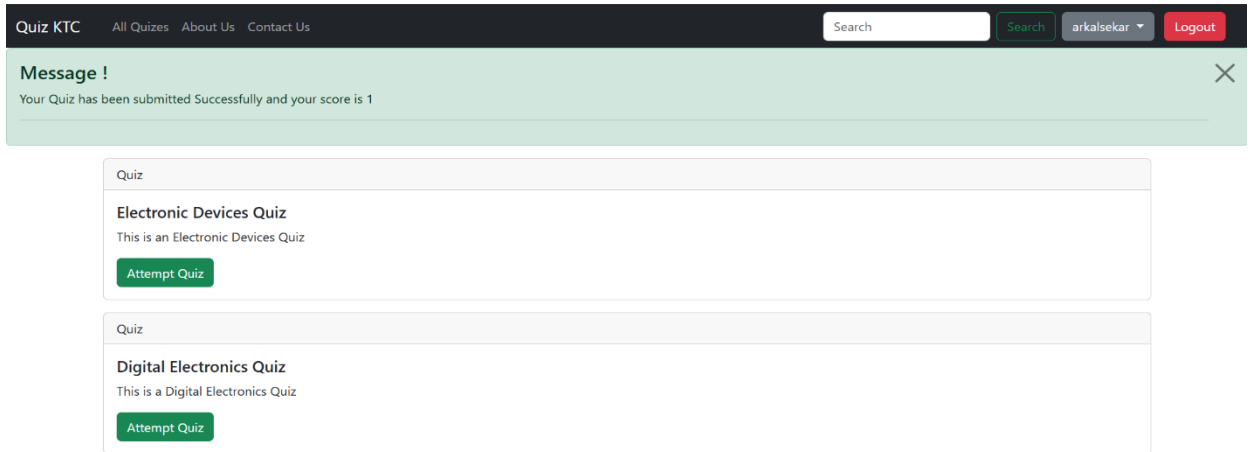
4.2.1 Admin Login Panel



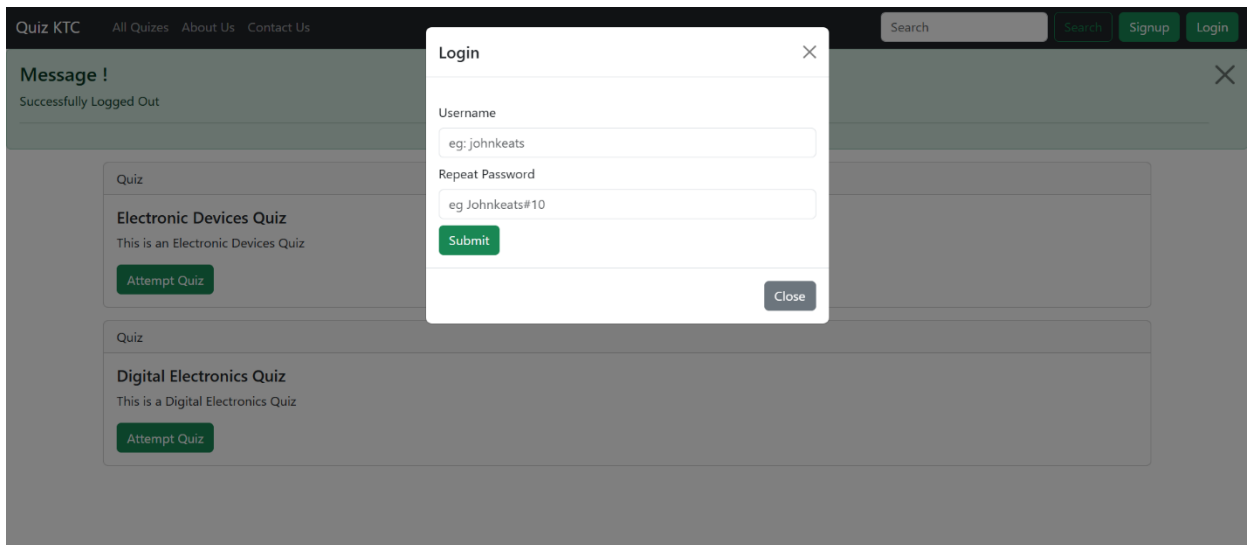
4.2.2 Admin Login Dashboard



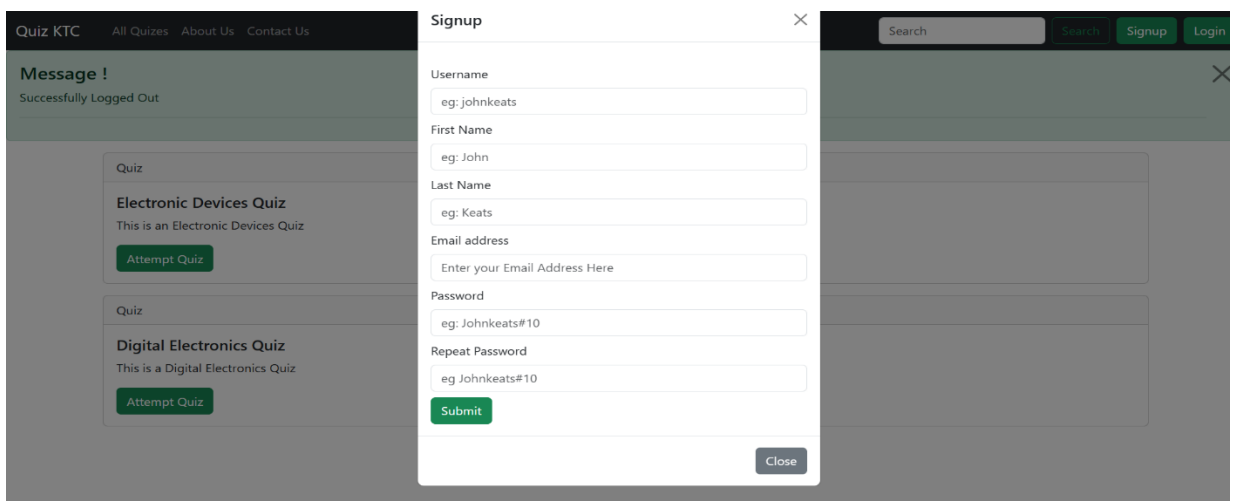
4.2.3 Quiz Home Page



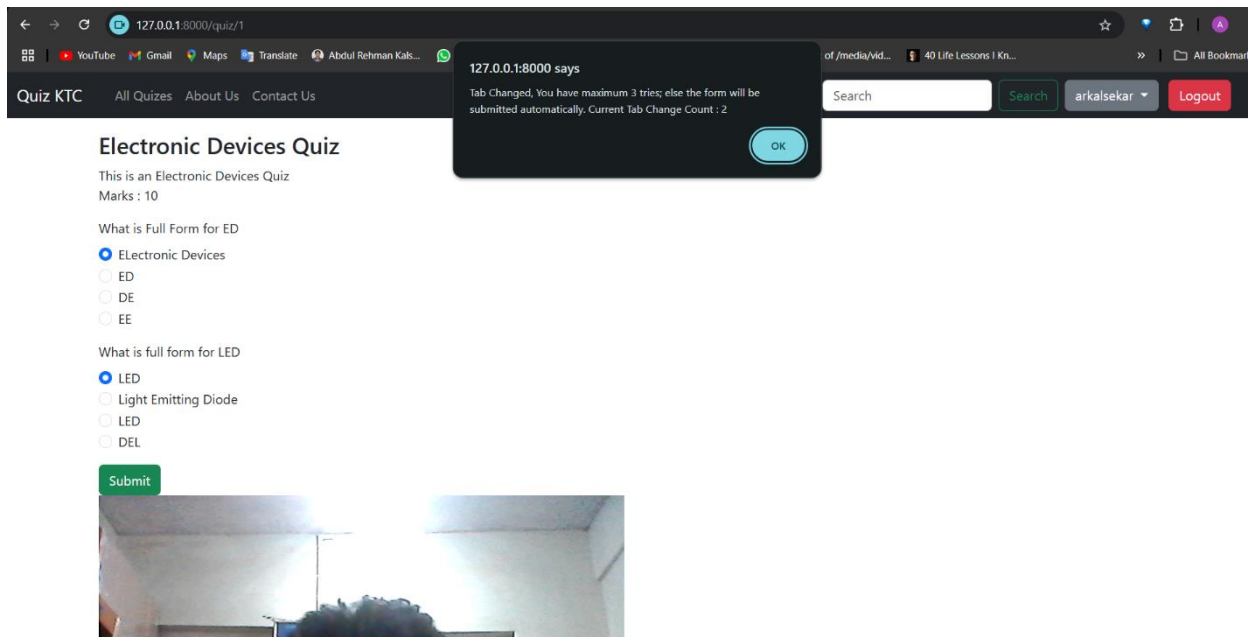
4.2.4 All Quizzes Page



4.2.5 Login Panel



4.2.6 Signup Page



4.2.7 Warning about tab / application switch

Chapter 5

Conclusion and Future Work

Conclusion

The quizKTC platform has successfully addressed key challenges in online assessment by integrating advanced AI-powered proctoring and user-focused features tailored for Anjuman-I-Islam's Kalsekar Technical Campus (AIKTC). This project has provided a fair and engaging testing environment, leveraging tools like tab-switch detection, eye-tracking, and personalized feedback to uphold academic integrity and enrich the learning experience. The positive response from students and faculty highlights the effectiveness of quizKTC in fostering an honest assessment culture and offering educators meaningful insights into student performance for targeted teaching.

Future Work

To expand the platform's impact, several enhancements are planned:

1. **AI-Driven Feedback:** Integrate an AI chatbot for personalized feedback, helping students identify and work on weak areas.
2. **Mobile Application:** Develop a mobile app to enable quiz accessibility on various devices.
3. **Learning Analytics:** Use machine learning to track and analyze performance trends, aiding educators in predicting and addressing learning needs.
4. **Advanced Proctoring:** Incorporate more robust proctoring features like screen recording and biometric verification to reinforce security.
5. **Collaborative Community:** Establish a teacher community forum for sharing best practices, quiz templates, and collaborative learning strategies.

References

Future enhancements for the QuizKtc platform include:

- 1. AI-Driven Feedback** : Implementing an AI chatbot that can provide personalized feedback to students based on their quiz performance, helping them identify areas for improvement.
- 2. Mobile Application** : Developing a mobile version of the platform to increase accessibility and allow students to take quizzes on-the-go.
- 3. Integration of Learning Analytics** : Incorporating machine learning algorithms to analyze quiz results over time, identifying patterns in student learning and providing predictive analytics for educators.
- 4. Expanded Proctoring Features** : Exploring additional proctoring technologies, such as screen recording and advanced biometric verification, to further enhance security during assessments.
- 5. User Community** : Creating a community forum where teachers can share best practices, quiz templates, and teaching strategies to promote collaborative learning.

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