**AUTHOR**

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Born in Tenali, Andhra Pradesh. Brought up in Chennai, Tamil Nadu. I am currently doing my B. Tech in Computer Science Engineering with specialization in Artificial Intelligence. I will be passing out in 2028. I m doing the online IITM B.Sc. Degree as a dual degree.

**DESCRIPTION**

This project implements a robust web-based quiz platform designed to facilitate both self-assessment for students and analytical monitoring for administrators. Users must log in, select a subject and chapter, attempt quizzes, and instantly view their scored performance. Administrators can manage quiz content, analyze user performance, and manage user accounts.

**TECHNOLOGIES USED**

1. **Flask**: Framework for building and running the web application.
2. **render\_template**: Serves HTML templates for different endpoints.
3. **request**: Handles incoming HTTP requests (GET/POST).
4. **redirect**: Redirects the user post action (e.g., after submitting a form).
5. **url\_for**: Dynamically generates URLs for routing within the app.
6. **flash**: Displays one-time messages (e.g., errors, confirmations).
7. **session**: Manages user session data, including login status and roles.
8. **sqlite3**: Interacts with a local SQLite database for persistent storage.
9. **HTML/CSS**: For user interface and front-end presentation.
10. **Werkzeug.security**: Implements secure password storage and verification.
11. **flask\_mail**: Enables email notifications (e.g., quiz reminders, monthly reports).
12. **flask\_caching**: Reduces database load by caching views or user dashboards.
13. **apscheduler**: Schedules background jobs for reminders and reports.
14. **threading & csv**: Used for asynchronous CSV export and reporting features.

**DB SCHEMA DESIGN**

|  |  |  |
| --- | --- | --- |
| **TABLE** | **COLUMNS** | **PURPOSE** |
| users | id, username, password, full\_name, qualification, dob, role, email, last\_login | Store all user/admin details |
| subjects | Id, name | List of all available subjects |
| chapters | Id, subject\_id, name | Chapters per subject |
| quizzes | Id, name, subject\_id, chapter\_id | Quiz grouping by chapter & subject |
| questions | Id, quiz\_id, question, option1, option2, option3, option4, answer | Individual questions per quiz |
| settings | Id, quiz\_duration | Quiz duration (in seconds/minutes) |
| scores | Id, username, quiz\_id, score, total, timestamp | Stores user attempts and their scores |

**ARCHITECTURE AND FEATURES**

* **Authentication & Roles:**
  + Users must register and log in; roles are enforced (admin/user).
  + Sessions are securely managed, with an admin having elevated management permissions.
* **Admin Features:**
  + Can add, view, edit, search, or delete subjects, chapters, quizzes, and questions.
  + Views detailed analytics on student quiz performance and attempts.
  + Can remove users from the platform if necessary.
* **User Features:**
  + Selects subject → chapter → quiz to attempt.
  + Each quiz displays multiple-choice questions; scores shown instantly after finishing.
  + Can view a detailed list of all previous quiz attempts.
  + Request a CSV export of their quiz history via email.
* **Quiz Experience:**
  + Each quiz is time-limited (default: 60 seconds).
  + Results and user analytics are maintained for continuous progress tracking.
* **Email and Notification System:**
  + Daily email reminders for pending quizzes (for inactive users).
  + Monthly activity reports sent to users summarizing their quiz participation and performance.
  + CSV exports and admin communications also sent by email.
* **Caching & Asynchronous Operations:**
  + Caching is used to reduce loading time of frequently accessed dashboards.
  + CSV exports are generated and sent over email asynchronously to not block user experience.
* **Scheduler:**
  + Automated jobs send reminder/report emails on fixed schedules (daily/monthly).

**DB SCHEMA NOTE**

There is one minor limitation noted: the timestamp in the scores table may contain inconsistencies due to a local system software issue, which may affect the reporting of quiz timing data.

**HOW TO USE**

* Access the login page on running the app.
* Admin logs in with default credentials (admin/admin123); users must register for access.
* Admin can manage system content and monitor users; users can take quizzes and check their progress.

**VIDEO**

<https://drive.google.com/file/d/1vgerWx2iLEBKiyM09lIJUvFdxO5Ja3ay/view?usp=sharing>