4. Online Quiz System

Title : Online Quiz System

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Objective: Build a timed quiz app with score tracking.

Tools : Java, JavaFX/Swing, MySQL

**Introduction**

The Online Quiz System is a Java based Desktop Application that provides a platform for conducting multiple-choice quizzes. As the developer, the focus was on implementing atimed quiz flow, integrating a database Backend, and designing auser-friendly Interface. The system supports secure login, randomized questions, a countdown timer, and automatic result calculation with persistence in MySQL.

**Abstract**

From a developer’s perspective, this project demonstrates practical application of Java programming, JDBC, and GUI development. The application architecture follows an MVC-like structure:

* Model**:** MySQL schema for users, questions, and results.
* View**:** JavaFX/Swing forms for login, quiz window, and result page.
* Controller**:** Java logic handling quiz flow, timer events, and DB operations.

By combining database operations with event-driven GUI logic, the system ensures real-time scoring and reliable storage of quiz attempts.

**Tools Used**

* **Java (JDK 8+)** – Core programming and OOP concepts.
* **JavaFX/Swing** – UI components (login form, quiz window, result screen).
* **MySQL + JDBC** – Persistent storage and data retrieval.
* **IDE:** Eclipse/IntelliJ (for faster debugging and testing).

**Steps in Development**

1. **Database Design:**
   * Created users table (username, password),
   * questions table (id, question, options, correct\_answer),
   * results table (user\_id, score, timestamp).
2. **Login System:** Implemented authentication logic using JDBC queries.
3. **Quiz Engine:**
   * Fetched randomized questions from MySQL.
   * Displayed one question at a time with radio button options.
4. **Timer & Events:** Integrated a countdown timer using Java Timer class / JavaFX Timeline.
5. **Score Calculation:** Updated score dynamically based on user responses.
6. **Result Handling:** Inserted final scores into results table and displayed a summary report.
7. **Testing:** Verified with multiple users, edge cases (timeout, invalid login, empty DB).

### Conclusion

The Online Quiz System is a Java and MySQL-based application designed to conduct timed quizzes with user login, randomized questions, and real-time scoring. It securely stores user data, quiz questions, and results in a database. The system provides instant feedback with correct answers and final scores after submission. It is ideal for educational and training environments, offering a reliable and interactive assessment tool. Future improvements can include multimedia support, mobile access, and advanced analytics.