

1. Introduction

- The Online Quiz System is a web-based application designed to allow users to **take timed quizzes** and track scores. Users can log in, attempt quizzes, and view their results. The system provides a simple and interactive interface while securely managing users, quizzes, and results through a backend server.

2. Abstract

- The project's goal is to develop a **timed quiz application** that randomizes questions per user, tracks scores, and stores results in a database. The frontend is implemented using **Angular**, and the backend is built with **Spring Boot (Java)**, using **MySQL** as the database. The system supports **login, quiz attempts, timed assessments, score calculation, and result display**. It demonstrates a practical use of REST APIs, dynamic content loading, and database interaction.

3. Tools Used

| | |
|--------------------|---|
| Frontend | Angular, TypeScript, HTML, CSS |
| Backend | Spring Boot (Java), REST APIs |
| Database | MySQL |
| Other Tools | Node.js, Maven, Postman, IDE (VS Code / IntelliJ) |

4. Steps Involved in Building the Project

1) Database Schema Creation

- Created four tables: `user`, `test`, `question`, `test_result`.
- Defined primary and foreign keys to maintain **data integrity**.

2) User Authentication

- Developed **login and registration modules** in Angular.
- Backend validates users and manages sessions.

3) Loading and Randomizing Questions

- Fetched questions via **Spring Boot REST API**.
- Implemented a shuffle algorithm in Angular to **randomize questions per user**.

4) Quiz Timer and Scoring Logic

- Implemented a **countdown timer** in Angular.
- Calculated user scores based on selected answers.

5) Storing Results

- Recorded user answers and scores in the `test_result` table.
- Stored additional metadata like **test ID, user ID, and timestamps**.

6) Displaying Results

- Angular components display **quiz results**, including correct answers and total scores.
- Users can view their performance immediately after submission.

5. Conclusion

- The Online Quiz System demonstrates a **fully functional web-based quiz application** using Angular and Spring Boot. The system supports **timed quizzes, randomized questions, score tracking, and result management** while maintaining simplicity in user authentication. It is suitable for educational and training purposes, providing a clean and interactive user experience.