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COMPLETED THE PROJECT NAMED AS : **IBM-NJ-ONLINE QUIZ APPLICATION**

PHASE-TECHNOLOGY PROJECT NAME: **NODE JS**

SUBMITTED BY,

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Phase 1- Problem Understanding and Requirements

Problem Statement:

1. **User Registration and Authentication**
   Users should be able to register, log in, and securely authenticate before attempting quizzes.
2. **Quiz Creation and Management**
   Admins or instructors should be able to create, update, and delete quizzes with multiple-choice questions.
3. **Timed Quizzes and Auto-Submission**
   Each quiz may have a time limit. The system should automatically submit the quiz when time expires.
4. **Question Types and Randomization**
   Support multiple question types (e.g., multiple-choice, true/false) and optionally randomize question order for each attempt.
5. **Real-Time Scoring and Feedback**
   After quiz completion, users should get immediate scores and feedback on their answers.
6. **Result Tracking and Reporting**
   Track users' performance over time and generate reports showing quiz history and scores.
7. **User-Friendly Interface**
   The application should be intuitive and responsive, accessible on various devices (desktop, mobile).

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User and Stakeholders:

Users:

- **Students/Participants (End Users)**

- **Primary Role:** Take quizzes and track their learning progress.
- **Important Features:**
    - **Registration/Login:** Secure authentication and user profile management.
    - **Quiz Attempt:** Ability to select, take, and submit quizzes.
    - **Score and Feedback:** Immediate results and performance insights after completion.
    - **Progress Tracking:** View historical performance and track improvement.

- **Instructors/Quiz Creators**

- **Primary Role:** Create and manage quizzes.
- **Important Features:**
    - **Quiz Creation:** Add questions (multiple-choice, true/false, etc.), set time limits, and define scoring.
    - **User Management:** Assign quizzes to students or groups.
    - **Results Review:** student performance and provide feedback or grades.
    - **Question Pool:** Create and manage a pool of questions for dynamic quiz creation

Stakeholders:

1.Students (Participants)

- As the end users of the application, students are the main stakeholders who will directly interact with the quizzes, answer questions, and track progress.
- Their feedback on quiz usability, content, and functionality is crucial for improving the app.

2. **Instructors/Teachers**
    - They are key stakeholders because they will define the curriculum (quiz topics), set the questions, and analyze student performance.
    - They need a user-friendly interface to create and evaluate quizzes effectively.

User Stories:
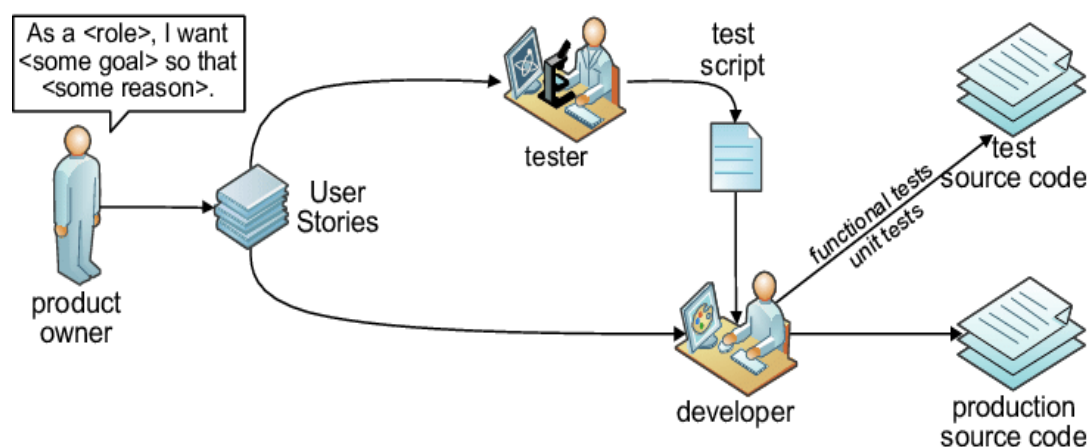
1. User Roles & Their Stories

- Create a quiz with different types of questions (MCQ, True/False, Short Answer).
- Set time limits for each quiz or question.
- Randomize question order for each user attempt.
- Assign quizzes to specific classes/groups of students.
- Set a start and end time for quiz availability.

2. General Functional Points

- User registration and login (with role-based access).
- Dashboard tailored to the user's role.
- Quiz creation tool with flexible question formats.
- Timer and auto-submit functionality.
- Secure quiz delivery (prevent cheating—e.g., question shuffling, copy-paste blocking).

3. Non-Functional Points

- **Usability**: Simple and intuitive UI for all roles.
- **Performance**: Can handle multiple users taking quizzes at the same time.
- **Security**: Prevent unauthorized access, ensure data integrity.
- **Scalability**: Can grow to support more users or institutions.
- **Accessibility**: Support for screen readers, keyboard navigation, etc.
- **Mobile Compatibility**: Responsive design for mobile and tablets.
- **Localization**: Support for multiple languages if needed.

MVP Features:

User Management

- User registration & login (with email/password)
- Role-based access:
    - **Teacher/Quiz Creator**
    - **Student/Quiz Taker**

Quiz Creation (for Teachers)

- Create new quizzes
- Add basic question types:
    - Multiple Choice Questions (MCQs)
    - True/False
- Set:
    - Quiz title & description
    - Time limit (overall)
    - Number of attempts allowed
- Publish quiz

Quiz Management

- View list of created quizzes
- Edit or delete a quiz
- View basic statistics (e.g., number of participants, average score)

Quiz Taking (for Students)

- View available quizzes
- Start quiz
- Answer questions (one at a time or all on one page)
- Timer countdown with auto-submit
- Submit quiz
- View score (instant grading for objective questions)

Create a Successful Mobile MVP

Wire Frame/API End Point List:

- **User Roles**:

  - Student
  - Teacher/Quiz Creator

- **Authentication**:

  - Register/Login
  - Role-based access control

- **Quiz Management (Teacher)**:

  - Create/Edit/Delete quizzes
  - Add basic question types (MCQ, True/False)
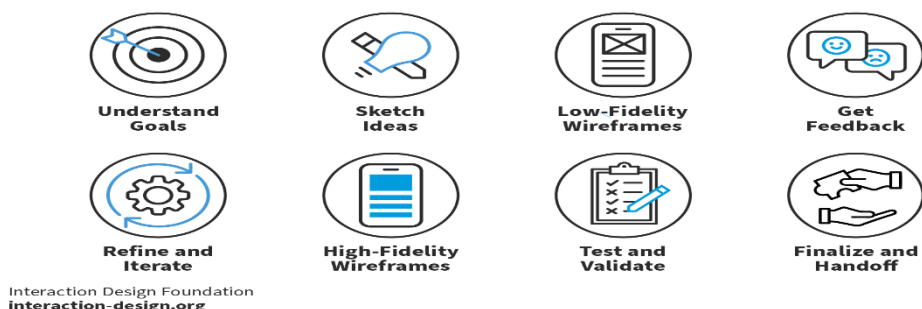 - Set quiz time limit
  - Publish quiz

Essential API Endpoints

- `POST /api/auth/login` – Login
- `POST /api/quizzes` – Create quiz
- `GET /api/quizzes` – List quizzes
- `POST /api/quizzes/{id}/attempts` – Submit quiz
- `GET /api/quizzes/{id}/results` – View results

Wireframe Pages

- Login/Register Page
- Dashboard (different for student & teacher)
- Create/Edit Quiz Page
- Take Quiz Page
- Results Page

Wireframe for UX Projects

Understand Goals | Sketch Ideas | Low-Fidelity Wireframes | Get Feedback

Refine and Iterate | High-Fidelity Wireframes | Test and Validate | Finalize and Handoff

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ACCEPTANCE CRITERIA:

Authentication

- User must be able to register and log in with email and password.
- Users are assigned roles: **Student** or **Teacher**.
- Only authenticated users can access the application.

Teacher Functionality

- Teachers can **create**, **edit**, **delete**, and **publish** quizzes.
- A quiz must include:
    - Title
    - Time limit
    - At least one question (MCQ or True/False)
    - Correct answers
- Only **published quizzes** are visible to students.

Student Functionality

- Students can **see and take** only published quizzes.
- Students must complete the quiz within the **set time limit**.
- Students can **submit** quiz answers.
- Students receive an **auto-graded score** after submission.

Results

- Teachers can view:
    - List of student attempts
    - Individual scores
    - Quiz statistics (e.g., average score)