Quiz App Database Design

Introduction

The purpose of this document is to outline the database design for a quiz application. The database is designed to manage users (students and teachers), quizzes, questio ns, options for answers, and student responses eciently. The following specication de tails the tables, their columns, relationships, and the overall schema for the applicatio n.

Functional Requirements

1. User Management:

○ Allow teachers to create and manage quizzes.
○ Allow students to participate in quizzes.

2. Quiz Management:

○ Each quiz is associated with a teacher.
○ Each quiz can have multiple questions.

3. Question Management:

○ Each question belongs to a specic quiz.
○ Each question can have multiple answer options, with at least one correct answer.

4. Answer Tracking:

○ Students can attempt a quiz only once.
○ Track student answers to each question in a quiz. **Database Design Tables:**

Users

● Columns:
○ id (PK): Unique identier for each user.
○ name: Name of the user.
○ role: User role, either 'student' or 'teacher'.
○ created_at: Timestamp when the user was created. Quizzes
● Columns:
○ id (PK): Unique identier for each quiz.
○ title: Title of the quiz.
○ teacher_id (FK from Users.id): The ID of the teacher who created the quiz.
○ created_at: Timestamp when the quiz was created. Questions
● Columns:
○ id (PK): Unique identier for each question.
○ quiz_id (FK from Quizzes.id): The ID of the quiz to which the question belongs.
○ text: The text of the question. Options
● **Columns**:
○ id (PK): Unique identier for each option.
○ question_id (FK from Questions.id): The ID of the question to which the option belo ngs.
○ text: The text of the option.
○ is_correct: Boolean indicating if the option is correct. Student_Answers
● **Columns:**
○ id (PK): Unique identier for each student's answer.
○ student_id (FK from Users.id): The ID of the student who answered the question.
○ quiz_id (FK from Quizzes.id): The ID of the quiz being answered.
○ question_id (FK from Questions.id): The ID of the question being answered.
○ option_id (FK from Options.id): The ID of the option chosen by the student.

Relationships: 1. Users ↔ Quizzes: One-to-Many
○ A teacher can create many quizzes.
○ Each quiz is associated with one teacher. 2. Quizzes ↔ Questions: One-to-Many
○ A quiz can have many questions.
○ Each question belongs to one quiz.
3. Questions ↔ Options: One-to-Many
○ A question can have many options.
○ Each option belongs to one question.
4. Users ↔ **Student_Answers**: One-to-Many
○ A student can answer many questions.
○ Each answer is associated with one student.
5. Quizzes ↔ **Student_Answers:** One-to-Many
○ A quiz can have many student answers.
○ Each answer is associated with one quiz.
6. Questions ↔ Student_Answers: One-to-Many
○ A question can appear in multiple student answers. ○ Each answer is associated wi th one question.

Submission Guideline:

1. - Submit the image of the **ER diagram** as .jpg/.png.