Functional Requirements:

1. **Students**
    - Students and teachers must be able to register and log in using unique credentials.
    - Students can view available quizzes and submit answers.
    - Students can select a quiz, answer questions, and submit it for scoring.
    - Students can view their scores after submitting a quiz.

2. **Teachers**
    - Teachers must be able to add, edit, and remove questions in a quiz.
    - Teachers can create, edit, and delete quizzes.
    - Teachers can view the performance of all students who participated in their quizzes.

3. **General**:
    - Each question must support multiple-choice answers.
    - The system must save the student's score history.

4. **Database Integration**:
    - All data related to users, quizzes, and scores must be stored in a local SQL database.

Non-Functional Requirements:

1. **Performance**:
    - The application must support up to 100 concurrent users without significant latency.
2. **Usability**:
    - The UI must be intuitive and responsive for both desktop and mobile devices.
    - Students and teachers should be able to navigate the system with no more than three clicks to access core functionality.
3. **Security**:
    - Passwords must be encrypted before storage.
    - Teachers should have access to their quizzes and associated scores only; students should not access other students' scores.
4. **Reliability**:
    - The application must recover from database connection issues within 5 seconds.
    - Data integrity must be maintained even in case of system crashes.
5. **Maintainability**:
    - Code must follow standard naming conventions and be well-documented.

OUR DATABASE:

Tables:

- Teachers: used as login info storage and profile of teachers.
- Students used as login info storage and profile of students.
- Quizzes used to store quiz meta data and as history of all quizzes.
- Questions used to store the question, the options and the correct option.
- StudentScores uses a quiz id, student id as foreign keys to act as linking table, also stores score.

Detailed Tables View:

Teachers

- TeacherID (Primary Key) - Unique identifier for teachers.
- Name - Teacher's name.
- Email - Teacher's email.
- Password - Encrypted password.

Students

- StudentID (Primary Key) - Unique identifier for students.
- Name - Student's name.
- Email - Student's email.
- Password - password

Quizzes

- QuizID (Primary Key) - Unique identifier for quizzes.
- Title - Title of the quiz.
- Description -Description of the quiz.
- TeacherID (Foreign Key) - Links to Teachers.

Questions

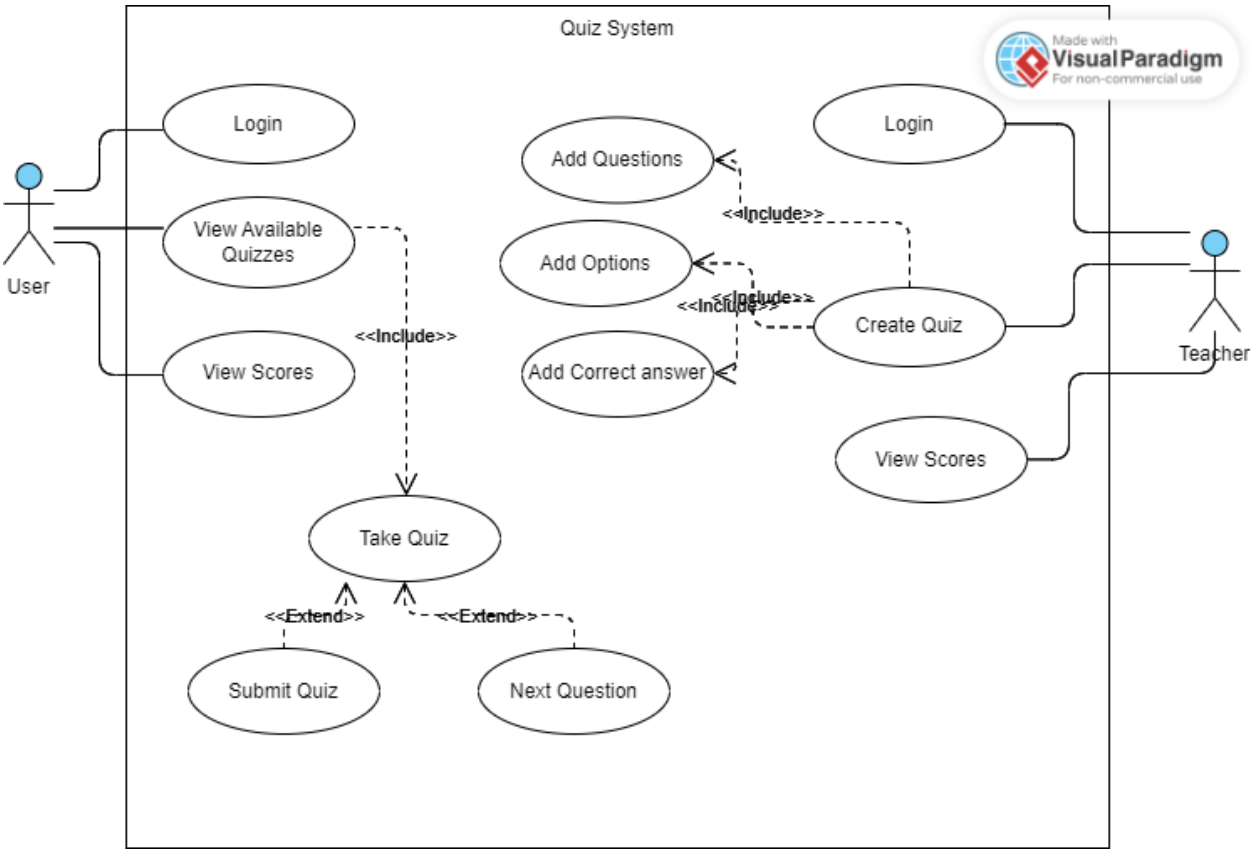
- QuestionID (Primary Key) - Unique identifier for questions.
- QuizID (Foreign Key) - Links to Quizzes.
- QuestionText -Text of the question.
- OptionA - First answer option.
- OptionB - Second answer option.
- OptionC - Third answer option.

- OptionD - Fourth answer option.
- CorrectAnswer-For automated checking.

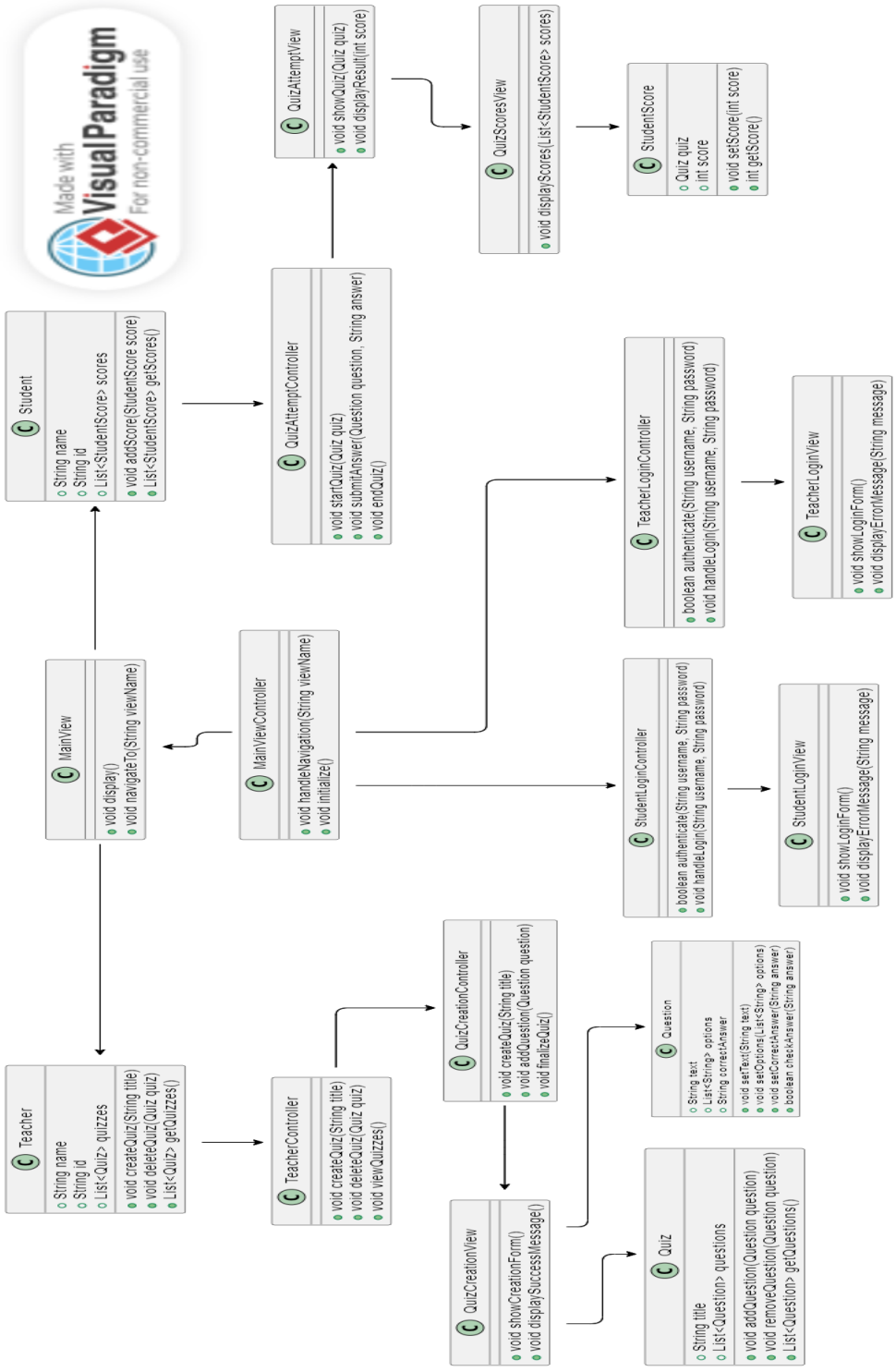
StudentScores

- ScoreID (Primary Key) - Unique identifier for scores.
- StudentID (Foreign Key) - Links to Students.
- QuizID (Foreign Key) - Links to Quizzes.
- Score -opbatined marks

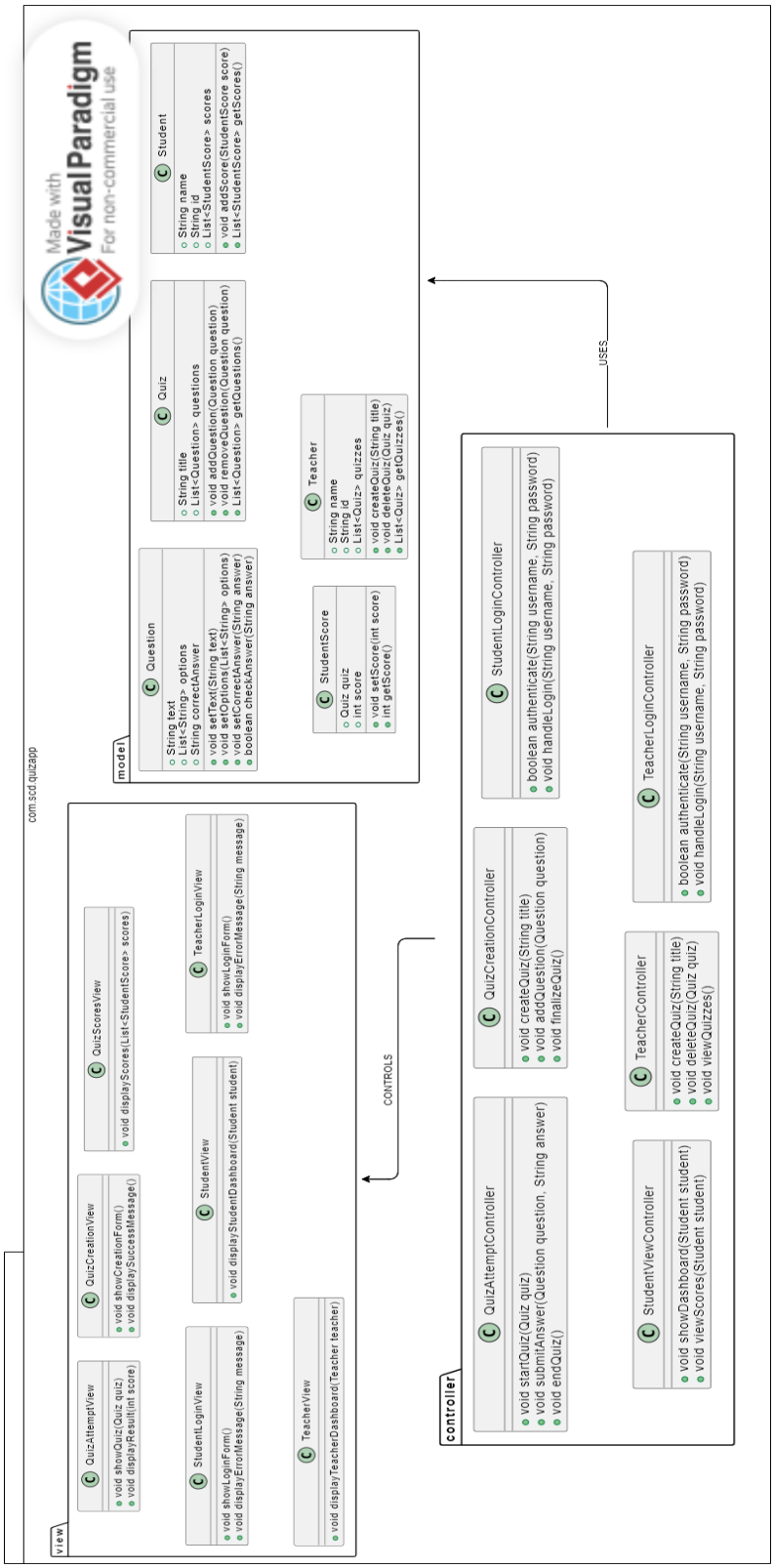
USE CASE:


Quiz System
Made with VisualParadigm For non-commercial use
Login
View Available Quizzes
View Scores
User
<<Include>>
Take Quiz
<<Extend>>
<<Extend>>
Submit Quiz
Next Question
Add Questions
Add Options
Add Correct answer
<<Include>>
<<Include>>
Login
Create Quiz
View Scores
Teacher

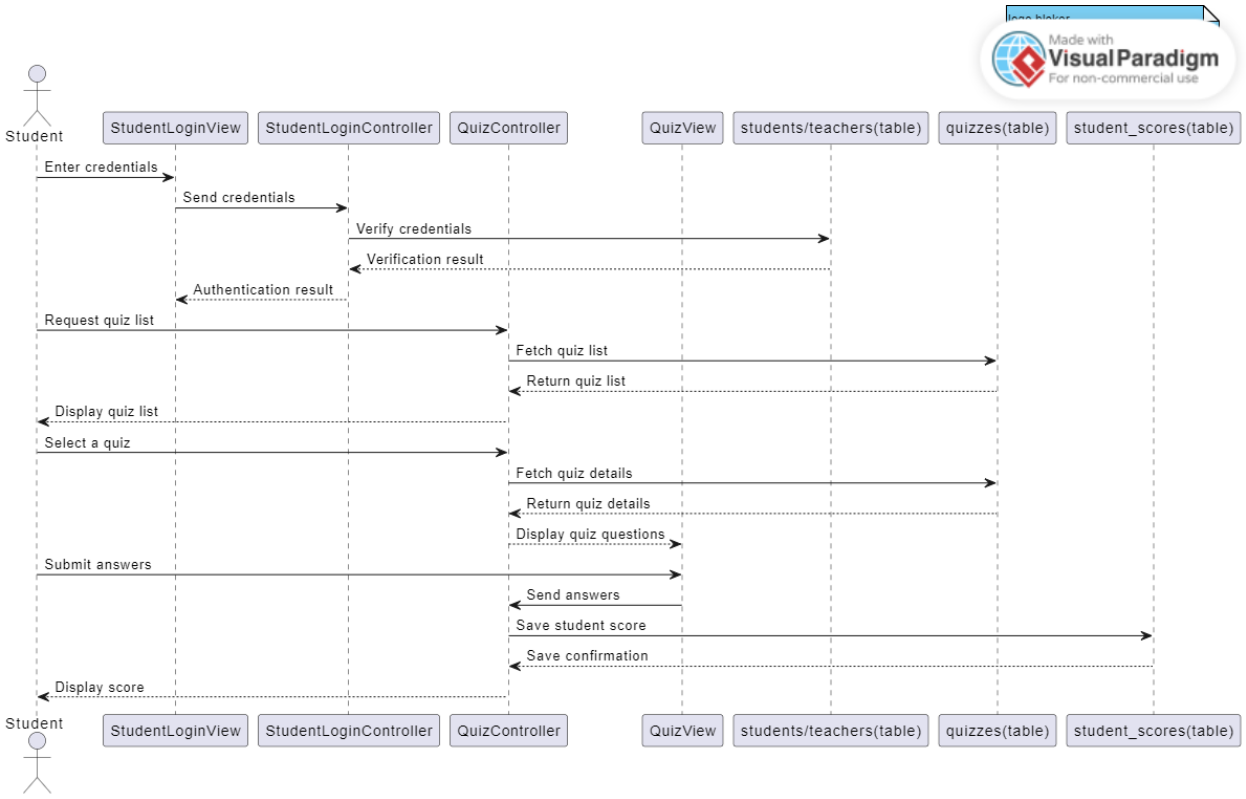
CLASS DIAGRAM:



PACKAGE DIAGRAM:



SEQUENCE DIAGRAM:



Some Class Functionalities to keep in mind:

- **Question**:
  Will be used to generate an object for each separated question the teacher makes.
- **Quiz**:
  It's an Object that primarily holds list of <Questions>, title, and Quiz information received from the database.
- **Student**:
  Manages student information such as ID, name, and login credentials.
- **StudentScore**:
  An Object for scores for quizzes taken by students, including quiz ID and score details. All of this data will come from database.
- **Teacher**:

  Stores teacher data like ID, name, and login credentials.

Controller Classes:

- **MainViewController**:
  The Navigator of the whole application.
- **QuizCreationController**:
  Facilitates the teacher to create a quiz and save it into the database.
- **StudentLoginController**:
  Authenticates student credentials and manages session data.
- **TeacherController**:
  Handles teacher-specific operations like managing quizzes and viewing scores.