

COMP1216

Coursework 1: Requirements Analysis, Specification, and Design

Group #8

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INTRODUCTION

This report has been produced in order to satisfy the requirements of Coursework I: Requirements Analysis, Specification and Design for the module COMP1206: Software Modelling and Design. The members of the group that have worked on this coursework are the following:

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All members of this group have equally contributed to the realisation of this report by applying the knowledge gained throughout the semester to accomplish the tasks outlined in the coursework.

All diagrams shown in the following pages have been realised with Visual Paradigm.

Following this introduction we provide a list of the assumptions we have made and a glossary explaining several terms used in the following pages.

Assumptions

1. The system is to be used in a University environment.
2. We have recognised other universities and payment companies as possible stakeholders in the case the system is distributed to other universities as proprietary software.

Glossary

- **User:** a user is a person connected to the system.
- **Registered User:** a registered user is a user registered into the system. Due to the academic nature of the system, a registered user belongs to the academic staff of the university.
- **Unregistered User:** an unregistered user is a user not registered into the system. Due to the academic nature of the system, an unregistered user is a student.
- **Quiz Creator:** a quiz creator is a registered user that creates a Quiz template.
- **Host:** a host is a user registered into the system which starts a session, called Quiz room, where players can join so that to answer questions. The host can start a quiz room based on multiple quiz templates only if he/she has either created them or received them by other registered users who have created them.
- **Player:** a player is a user (registered or unregistered user) that joins a quiz room. A player can only answer the questions present in the quiz room he/she joins.
- **Quiz Template:** a quiz template is a collection of questions which in turn comprise at least two and at most four selectable answers. Every question of a quiz template must be matched with a timeout within which players must submit their answers. Only the creator of the quiz template can share it. The quiz template can be shared with any other user registered into the system. A quiz template is associated with only one quiz creator.
- **Quiz Room:** a quiz room is a session started by the host. A quiz room is associated with a unique key called token. A quiz room comprises at least one and at most ten quiz templates. A quiz room must be populated by at least one and at most 300 players. A quiz room also contains a report detailing player performance.
- **Token:** a token is an alphanumeric string that uniquely identifies a quiz room. Players can join a quiz room only using the token. It's the host's responsibility to share the token with the users he/she wants to invite to join the quiz room. The system is not involved in the process of sharing the token.
- **Report:** a report contains several statistics regarding the performance of the players throughout a quiz room. A report is attached to only one quiz room and does not save the performance of the single players as the players can be unregistered users. Therefore, a report gathers only general statistics about the performance of the players during a quiz room. The host of a quiz room can share a report with any other user registered into the system.

Scope Section

Business case:

To provide high quality and outstanding education to the students.

Need:

1. To increase the engagement of the students in the lectures in order to promote active participation, which results in a better understanding of the material.
2. The current tools to create and share quizzes are not suitable for the University needs. Therefore, a more effective and efficient tool must be developed.

Goals:

1. To provide a way for the academic staff to create and share quizzes quickly and easily.
2. To let the academic staff receive immediate feedback on the understanding of the students.
3. To improve the academic performance of undergraduate and graduate students.

Stakeholders:

- University
- Other universities (if the system is distributed)
- Academic staff
- Students
- Platform maintainers (Software developers)
- IT Department
- Payment companies (if the system is sold to other universities)
- Server companies (if the system does not run on internal servers)
- Network maintainers

High-level operational concepts:

- Registered users can create and share quizzes with other registered users.
- A created quiz can be edited only by the creator of the quiz.
- Only registered users that have access to at least one quiz template can start a quiz room.
- A quiz can contain several questions and each question must be multiple-choice with at least 2 selectable answers and at most 4 selectable answers.
- Each question must have a predefined timeout that can be edited by the quiz creator.
- When a quiz is initiated a unique key (Token) is associated with the quiz.
- The players can join a quiz by using the Token associated with the quiz.
- Each question of the quiz terminates if one of the following occurs:
 - The time of the question is up
 - All participating players have answered
 - The host terminates the question early
- When a question terminates a summary of the answers is displayed
- When a quiz terminates a report is generated and saved into the host account.

Assumptions: The system is to be used in a University environment

Constraints: The system must be terminated within the next academic year.

Scenarios Section

Scenario 1: A user signs in and creates a new quiz containing several multiple-choice questions. After finishing the quiz, the user shares it with another registered user and logs out.

- The user signs in and is taken to the home page of his/her account.
- The user selects "Create New Quiz" and is taken to the "Quiz" screen
- The user types the name of the Quiz
- The user selects "Add Question to the Quiz" and is taken to the "Question of the Quiz" screen
- The user selects the number of questions (3) of the Quiz and is taken to the "Questions of the Quiz" screen
- The user selects the number of selectable answers (3) for each question
- The user selects the time for each question
- The user types the question text for each question
- The user types the answer text for all selectable answers of each question
- The user selects the correct answer for each question
- The user saves the quiz
- The user selects "Share Quiz" and is taken to the "Share Quiz" screen
- The user types the ID number of the registered user he/she wants to share the saved quiz with
- The quiz is sent to the account associated with the ID number typed
- The user is acknowledged of the success of the operation
- The user logs out

Scenario 2: A host signs in and starts an existing quiz. The players join in and answer the questions.

- The host signs in and is taken to the home page of his/her account
- The host selects "Start an Existing Quiz" and is taken to the "Quiz Room" screen
- The host selects a quiz among the ones available to him/her which contains 3 questions
- The system generates the token associated with the "Quiz Room"
- The host shares the token with the players he/she wants to invite to join the Quiz
- The players access the system
- The players select "Join a Quiz Room"
- The players type the Token value and are taken to the "Quiz Room" screen
- The host starts the quiz
- All players answer the first question before the time is up
- The first question terminates
- The host receives a summary of the answers selected by the players
- The host starts the second question
- Not all players answer the question
- The host terminates the question
- The host receives a summary of the answers selected by the players
- The host starts the third question
- Not all players answer the question
- The question terminates because the time is up
- The host receives a summary of the answers selected by the players
- The host is acknowledged that the quiz is terminated
- The players are acknowledged that the quiz is terminated
- The system closes the quiz room
- The host receives a report regarding the statistics of the quiz room

Use Cases Section

Use Case 1

Use Case Name: createQuizTemplate

Initiating Actor: Initiated by the QuizCreator (RegisteredUser)

Scope: To create a new Quiz template

Participating Actors: QuizCreator (RegisteredUser)

Events Flow:

1. The QuizCreator requests the system to create a new Quiz template
2. The System responds by requesting a name to associate the Quiz template with
3. The QuizCreator provides the name of the Quiz template
4. The System responds by creating an empty Quiz template associated with the name provided
5. The QuizCreator adds several questions to the Quiz template
6. The QuizCreator adds the question text to each question
7. The QuizCreator adds several answers to each question of the Quiz template
8. The QuizCreator adds the answer text to each question
9. The QuizCreator specifies the right answer for each question
10. The QuizCreator specifies the time for each question
11. The QuizCreator requests to submit the modifications that have occurred
12. The system responds by populating the Quiz template with the questions added by the QuizCreator, including the answers for each question, the right answer for each question and the time of each question
13. The System saves the Quiz template into the QuizCreator personal account
14. The System notifies the QuizCreator about the outcome of the operation

Entry conditions: The QuizCreator must be logged into his personal account.

Exit conditions:

1. The QuizCreator has received an acknowledgement that the Quiz template has been saved successfully into his account, OR
2. The QuizCreator has received an explanation indicating why the Quiz template has not been saved successfully on his account

Exceptions:

1. The QuizCreator specifies 0 or 1 answer for a question
 - The System will request the QuizCreator to add more answers to the question otherwise the question won't be included into the Quiz template
2. The QuizCreator specifies more than 4 answers for a question
 - The System will request the QuizCreator to remove some answers to the question otherwise the question won't be included into the Quiz template
3. The QuizCreator does not select the right answer for a question
 - The System will request the QuizCreator to select a right answer otherwise the answer won't be included into the Quiz template
4. The QuizCreator does not add the question text to a question
 - The System will request the QuizCreator to add the question text to question otherwise the question won't be included into the Quiz template
5. The QuizCreator does not add the answer text to an answer
 - The System will request the QuizCreator to add the answer text to answer otherwise the answer won't be included into the Quiz template

Use Case 2

Use Case Name: startQuizRoom

Initiating Actor: Initiated by the Host (RegisteredUser)

Scope: To start an existing quiz template

Participating Actors: 1. Host (RegisteredUser) 2. Player (RegisteredUser)

Events Flow:

1. The Host requests to start a Quiz room
 2. The System responds by requesting the Host to select a Quiz template among the ones available on his/her personal account
3. The Host selects a Quiz template among the ones available on his/her personal account
 4. The System responds by creating a Quiz room which includes the Quiz template selected by the Host
 5. The System generates a Token associated with the Quiz Room
 6. The System provides the Host with the Token associated with the Quiz Room
7. The Host shares the Token with some actors Player
8. The actors Player request to join the Quiz room
 9. The System responds by requesting the actors Player to provide the Token associated with the Quiz room
10. The actors Player provide the Token associated with the Quiz room
 11. The System adds the actors Player to the Quiz room
12. The Host requests to start the Quiz room
 13. The System responds by showing the next question to the actor Players
14. The actor Players answer the question selecting one of the selectable answers
 15. The System interrupts the question when the question time is up
 16. The System collects the answers of the actor Players
 17. The System generates a summary of the answers of the actor Players
 18. The System provides the Host with the summary
19. The Host requests to start the next question
20. **Steps 13 to 19 will repeat until no other question is available in the Quiz template of the Quiz room**
 21. The System generates a report regarding the statistics of the Quiz room
 22. The System closes the Quiz room
 23. The System notifies the actors Player that the Quiz room has been closed
 24. The System notifies the Host that the Quiz room has been closed
 25. The System saves the report into the Host account

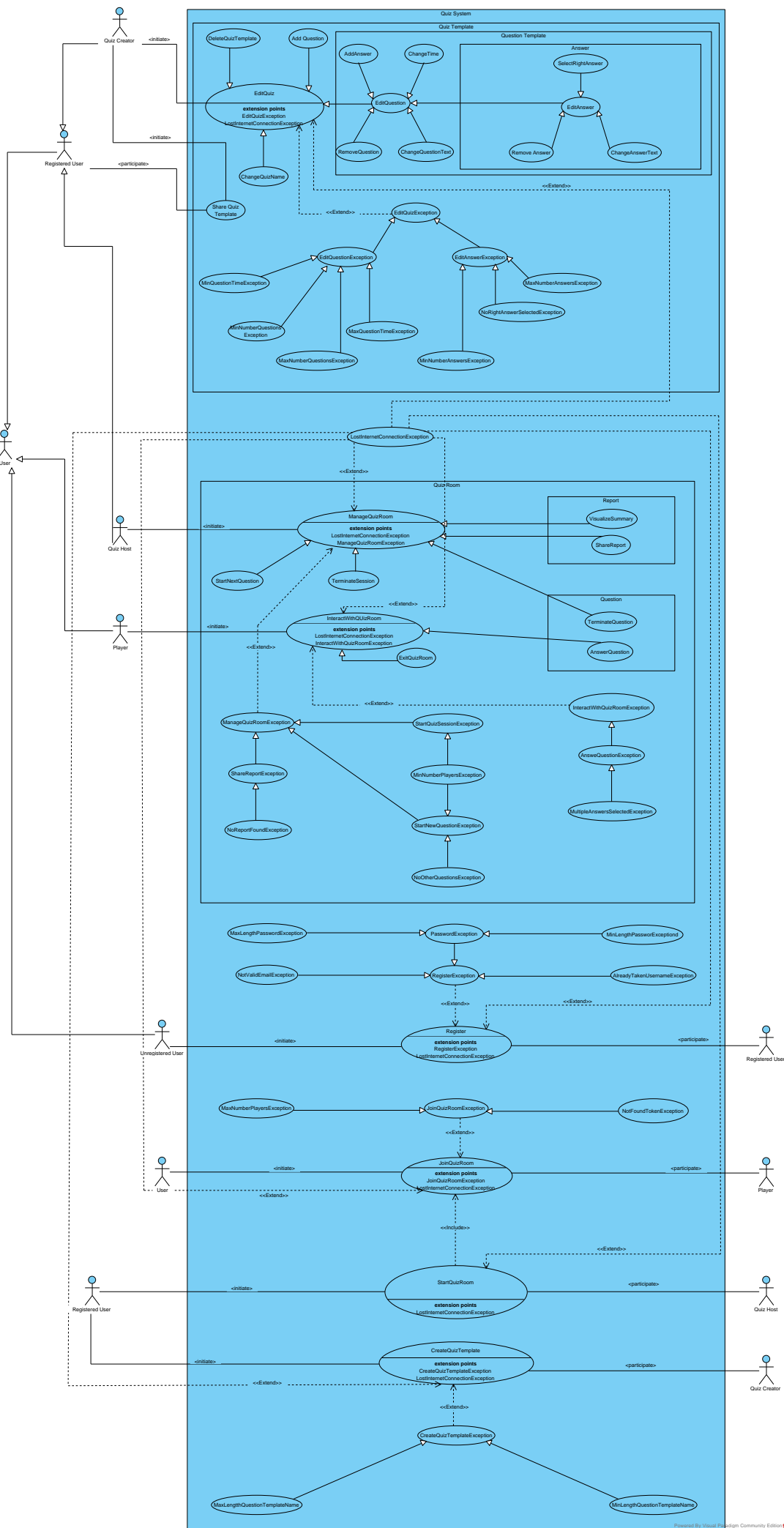
Entry conditions: The Host must be logged into his personal account

Exit conditions:

1. The Host and the actors Player have received an acknowledgement that the Quiz room has been closed successfully because all questions associated with the Quiz template have been answered.
2. The Host and the actors Player have received an explanation why the Quiz room has been closed before all questions of the Quiz template have been answered

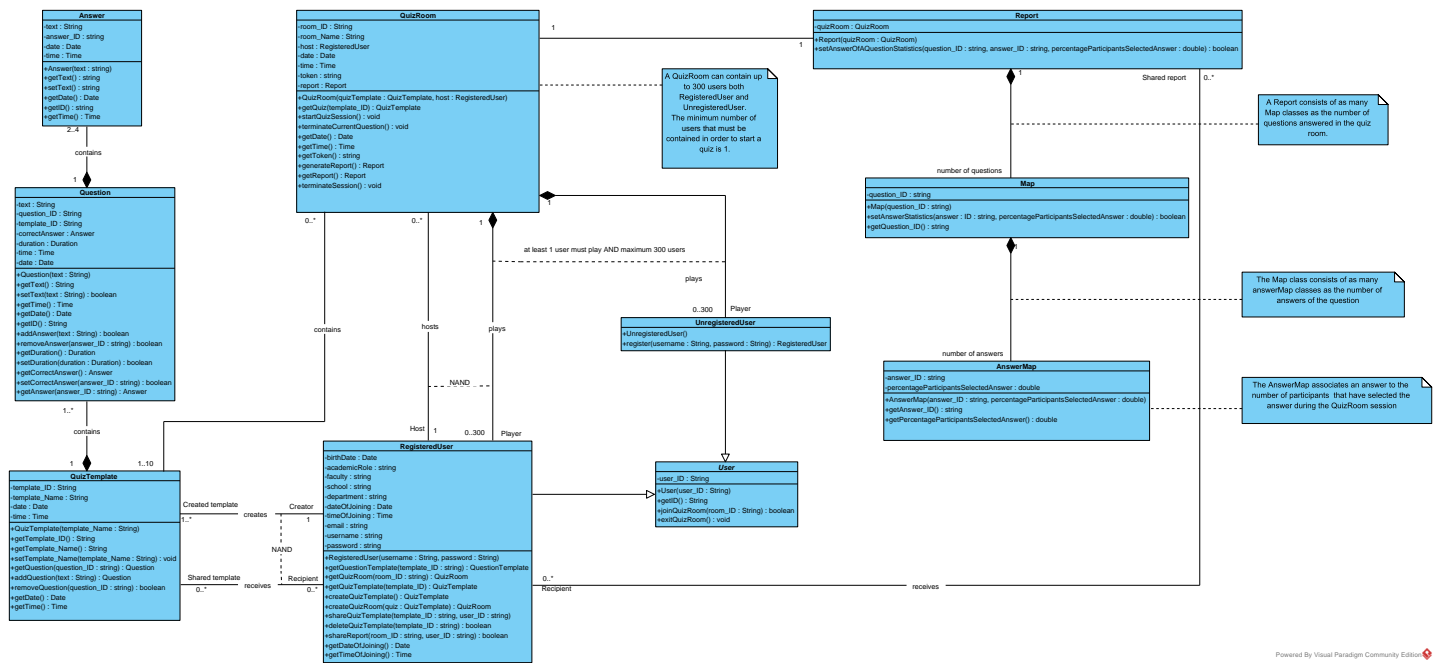
Exceptions:

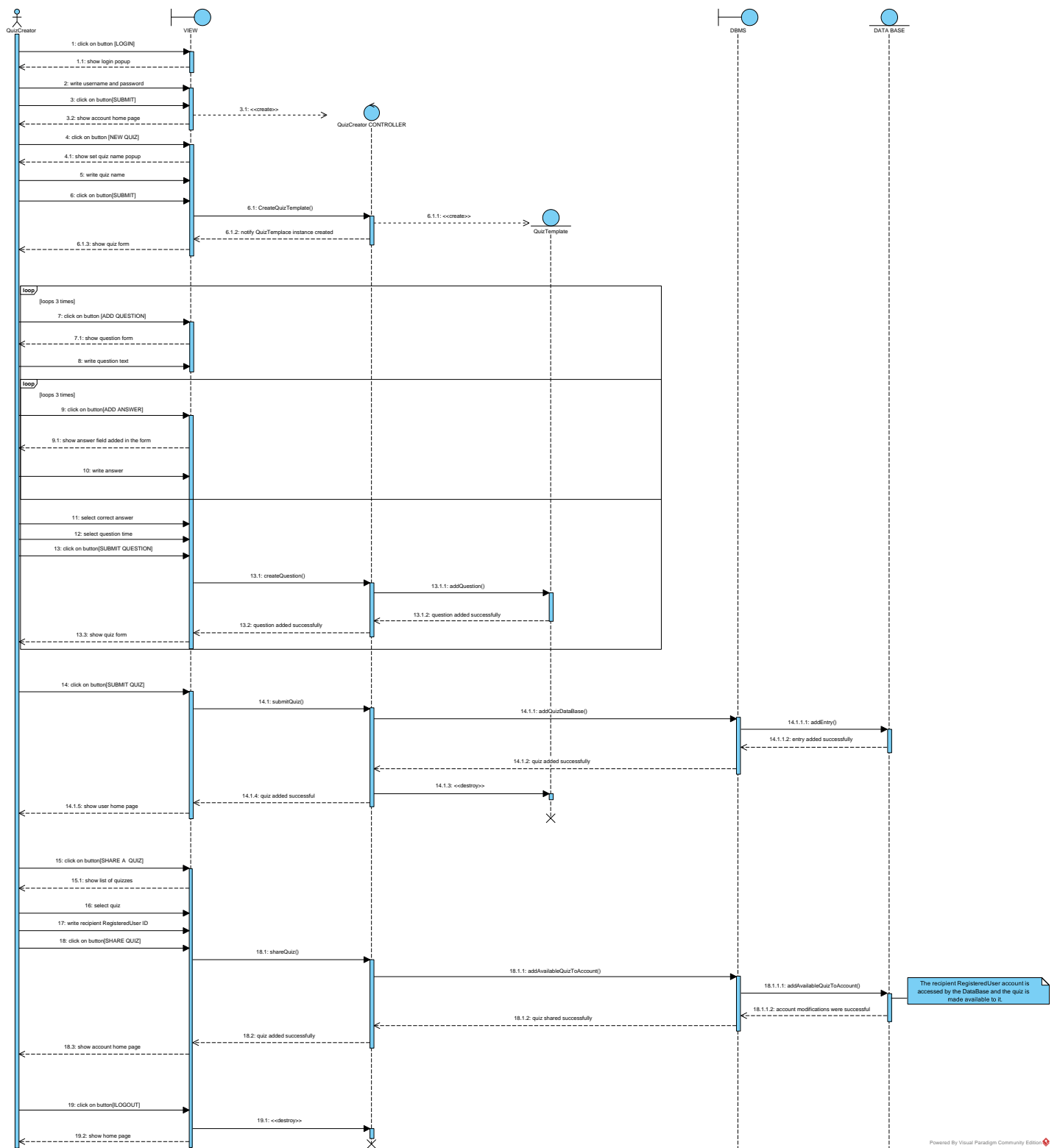
1. An actor Player provides a wrong Token not associated with any Quiz room
 - The System will request the actor Player to provide again a valid Token
2. All actor Players answer a question before the question time is up
 - The System will interrupt the question immediately
3. The Host interrupts a question before the question time is up and all actor Players answer the question
 - The System will interrupt the question immediately
4. The Host does not start the next available question within 1 hour
 - The System will close the Quiz room and acknowledge the Host and the actor Player



Use Case Diagram

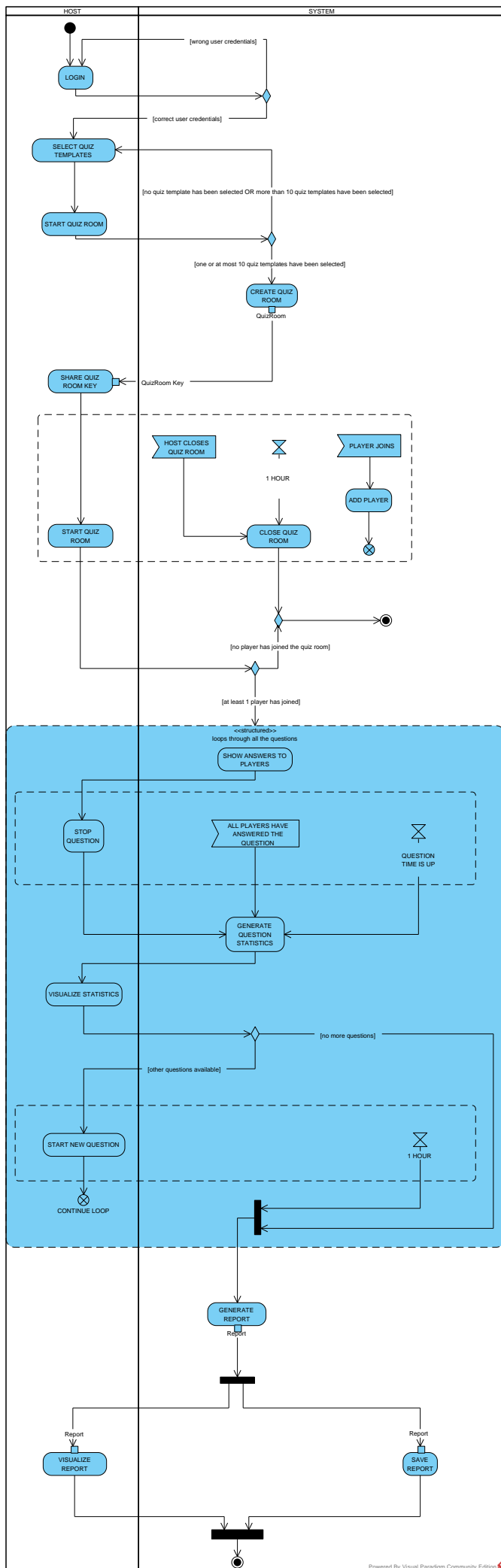
CLASS DIAGRAM





Sequence Diagram Scenario 1

There are 2 nested loops which explains the process adding 3 questions which in turn contain 3 answers each.



Activity Diagram