**1. Requirements Analysis**

## 1.1 Function

The main purpose of the project was to create an entertaining computer game designed for children, to introduce and encourage them to learn about computer science, the games would be used alongside traditional teaching methods and can supplement their understanding of the curriculum and will also give them the opportunity to think more logically.

## 1.2 Reason

Background: Nowadays, video games are becoming more and more popular and they are particularly common amongst the younger generation. Combining video games and computer science, can teach kids some simple knowledge about computer science in advance and help kids to think logically and get interested in this field, which will finally prepare them for programming languages.

Method: After running, it is very necessary to develop a logic game for people to play on their computer. On the other hand, an interesting game can help people pass the leisure.

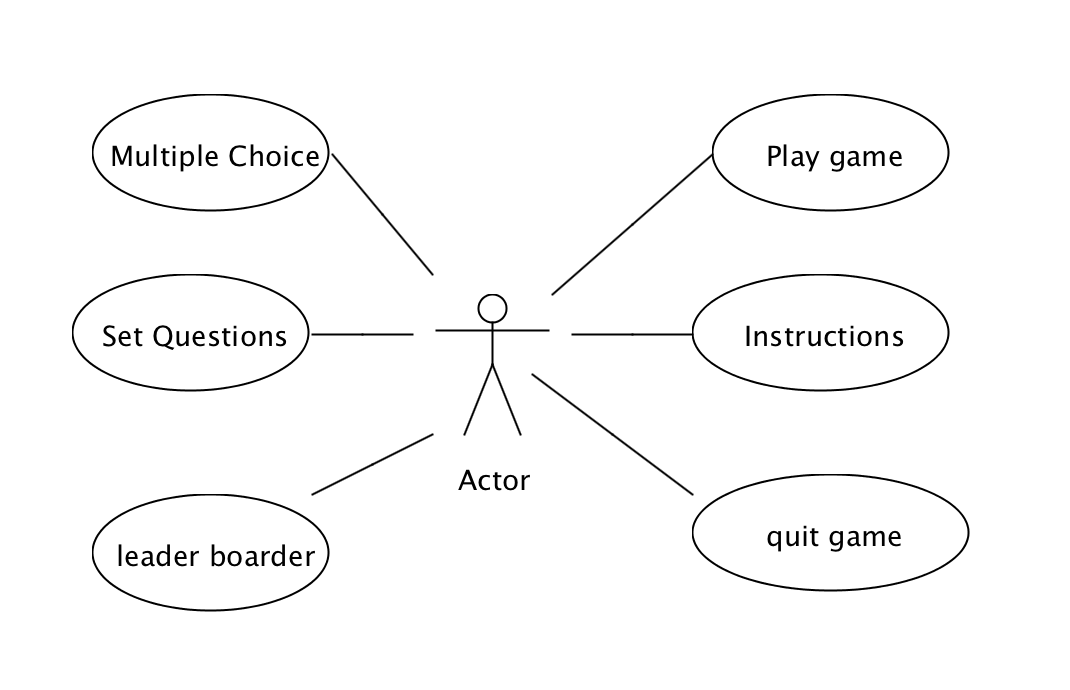
## 1.3 User

|  |  |  |  |
| --- | --- | --- | --- |
| **Stakeholders** | **Requirements** | **Potential influence** | |
| positive | negative |
| Designers | To develop a game for children | Improve coding ability.  First experience of group software development, real world application. | Can be difficult to produce, since we are novice developers.  Time consuming, working out the best method of implementing the code, through trial and error. |
| Children | To learn about a new subject.  Improve computer science knowledge | Improve logical thinking ability.  Become introduced to something that they would have never other wise tried. | Could put them off computer science if the game isn’t engaging. |

**2. Functional requirements**

## 2.1 Functional division

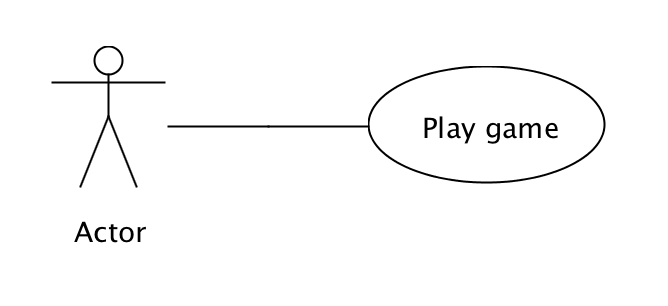
1. Play game function
2. Check instructions function
3. Leader border function
4. Multiple choice function
5. Set questions function
6. Quit question



**2.2 Functional description**

2.2.1

Use case: **play game Diagram:**

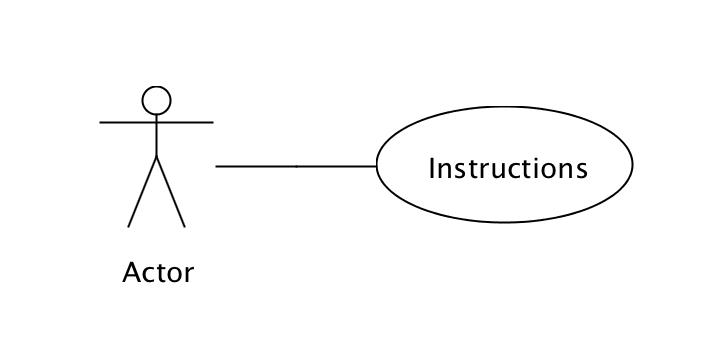


Game function:

Users play this game to improve their binary knowledge. It is a game for children to eat fruits: the apple represents ‘1’, the apple core represents ‘0’, there are 4 bits that represent a different binary number. When the answer is true by successfully arranging the apples then the game will speed up, otherwise, the caterpillar will slow down, finally it will tally up the final score and jump to leaderboard.

2.2.2

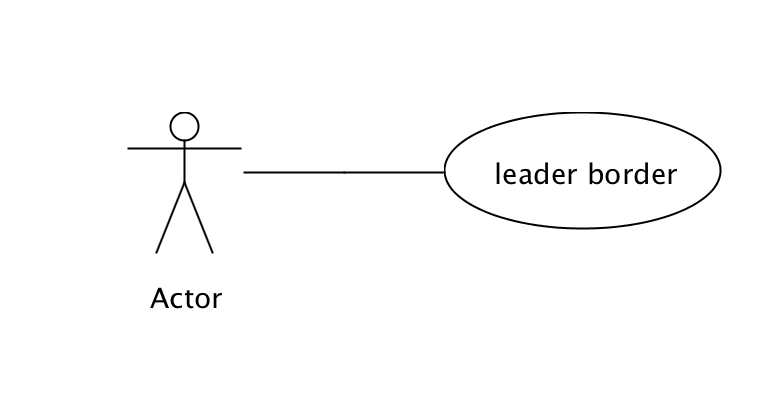
Use case: **Instructions Diagram:**



Game function: Users check instructions page to firstly to learn about the concept of binary, it shows them how to convert numbers into their equivalent 01 combination. Accessed by a built-in scrollbar, the users can then see further instructions on how to play the game.

2.2.3

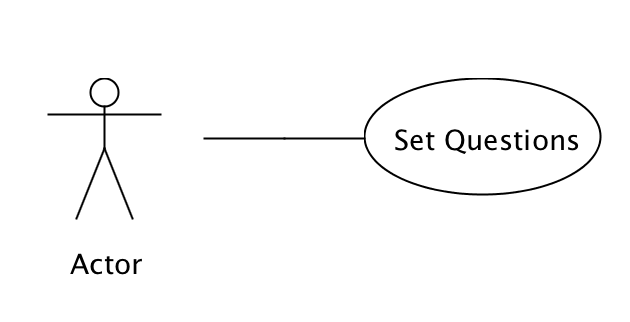
Use case: **Leader border Diagram:**



Game function: Here the children can see the scoreboard. We have designed it so that the table is flexible enough to be sorted either by username or by score, there is also a ‘back’ button, which returns to the main menu interface.

2.2.4

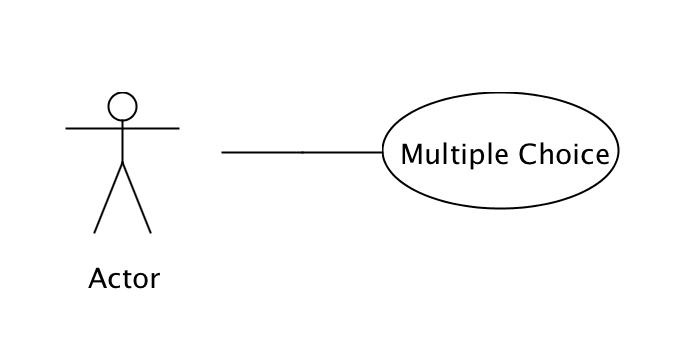
Use case: **Set Questions Diagram:**



Game function: There are some questions default, and user can enter this interface and click ‘add’ button to set new questions and 4 answers which will be shown in the game interface.

2.2.5

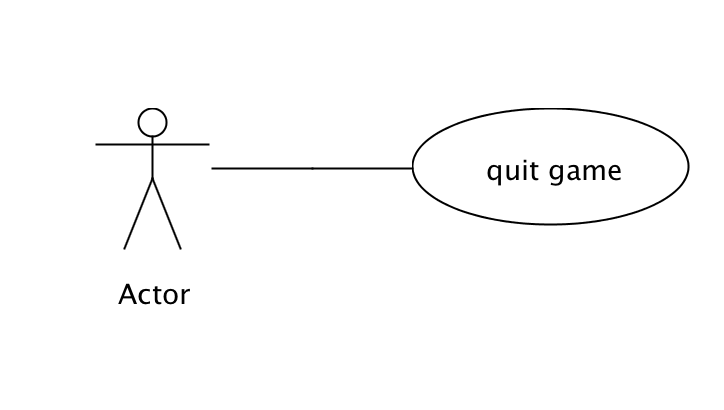
Use case: **Multiple Choice Diagram:**



Game function: This is the main ‘game’ element of our project, in the other mode where you set questions, that style is more geared as a learning tool and is to be controlled by the teacher. Once the player has built up their confidence in their comprehension of binary they can then move onto the race-style version of the game. In the game the player will be shown question gradually increasing in speed if answered correctly short time, the correct combination of the 4 apples and apple cores need to be selected, in order to move onto the next question.

2.2.6

Use case: **Quit Diagram:**



Game function: Leave game

**3. The feasibility analysis**

## 3.1 Playability

As a game application, the playability is a highly important element to the game’s success. If the game is engaging and interesting the children will repeatedly play the game, thus it will expose them to computer science concepts for longer which in turn will improve their understanding and hopefully make them value and appreciate the subject more.

## 3.2 Simplicity

The simplicity of our game is something we believe to be a strength, the left/right instructions make it very intuitive to play. As a result, the majority of the game time will be playing and learning the binary, not spent mastering the game-play methods. When tested on members of the computer science faculty, it took us very little time to explain the point of the game and how to play it, within minutes they could start playing the game and recorded impressive scores.

## 3.3 Usability

The game works well on a computer but also the simple instructions would make it work well on a mobile phone, the game-play suits mobile phones which are obviously very popular amongst the younger generation, with the growth in sales of smart phones and tablets.

**4. SWOT Analysis**

|  |  |
| --- | --- |
| STRENGTH: | WEAKNESSES: |
| 1. Solid team have a uniformed target and have full confidence with this project  2. Team members have enough time to work on this project  3. Professional guidance from professor Ian  4. Flexible organization structure.  5. The idea can be taken as far as we want.  6. Could be extended to co-op | 1. Lack of experience for project management  2. Lack of JAVA development experience  3. Lack of related experienced software engineers |
| OPPORTUNITIES: | THREATS: |
| 1. Games market is very popular amongst children.  2. Will have the support of a lot of educational institutions and parents nationwide.  3. Teachers could be open to more modern approaches to teaching and more parents focus on their children’s education.  4. Computer science is growing in popularity, therefore there is a wider market that this game can appeal to. | 1. There are many similar Game online  2. Our team have little experience on our project  3. Game may be simple  4. Our potential clients may choose other games for their entertainment.  5. Many youth well choose play games on their mobile phone  6. We should consider more about memory in terms of performance |