

# SIMON

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# 1 Software Requirement Specification

## 1.1 Introduction

### 1.1.1 Aim of the document

By following this document, the reader will have a clear explanation of the final product, its way of use and the fundamental steps taken to design the software

### 1.1.2 Overview of the defined system

Simon is a classic memory game that challenges players to repeat an ever-growing sequence of colors. At each level, the game lights up a sequence of colored buttons. The goal is to repeat the sequence exactly. As the game progress, the sequence gets longer and it's more and more difficult to remember. The game can be played in 4 different difficulties: easy, medium, hard, extreme. As the difficulty increases, decreases the time to repeat the sequence shown and the time to show the sequence itself. The game keeps track of the games played and shows the top 10 scores of all time.

### 1.1.3 HW e SW requirements

In order to use this system, an android phone with minSdk = 24 (Android 7.0 Nougat) is required. An android phone with 2+ GB of RAM is suggested. Check Benchmark section for details.

## 1.2 User Stories

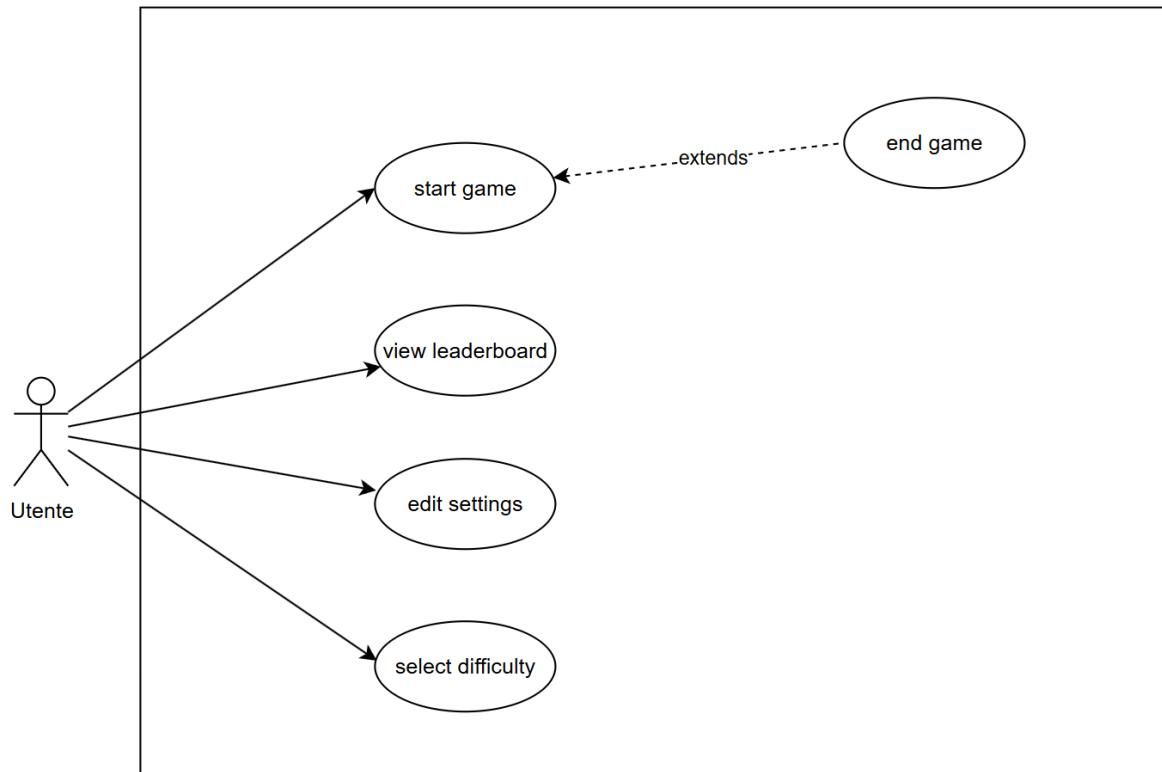
- As a user, I want to see my top 10 scores, so I can check if I improved over time.
- As a user, I want to select game difficulty, so I can enjoy the game
- As a user, I want to start a game, so I can have fun
- As a user, I want to change app theme, so I can personalize my experience

## 1.3 Functional Requirements

- The system shall provide a settings interface
- The system shall provide a game interface.
- The system shall provide a leaderboard interface.
- The system shall provide a difficulty changer
- The system shall provide english and italian languages support

## 1.4 Use Cases

### 1.4.1 Overview Diagram



## 2 Storyboards

The app provides the possibility to choose between 3 different themes.  
Two themes are based on famous video games/cartoons, but the app is for educational purposes only, so there is no copyright infringement.  
The app changes the audio effects based on selected theme.  
The user can choose languages between Italian and English.

### 2.1 Mario Theme

It is inspired by the famous and award winning video game: Mario Bros.

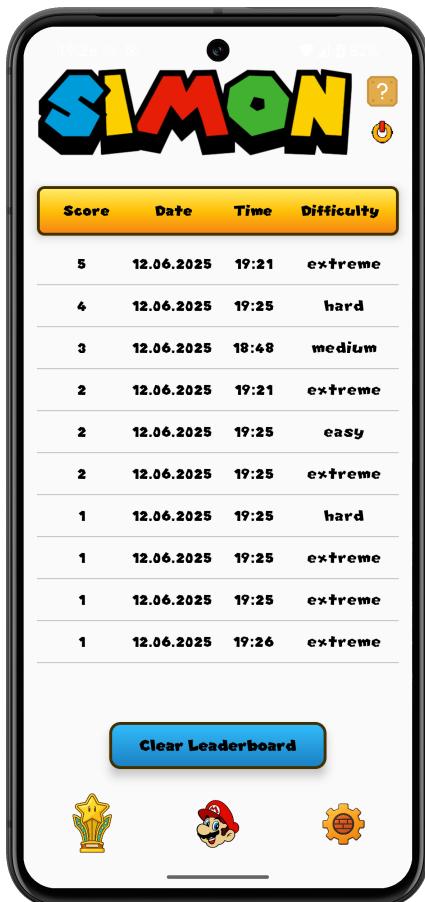


Figure 1: \*  
Mario Leaderboard Page

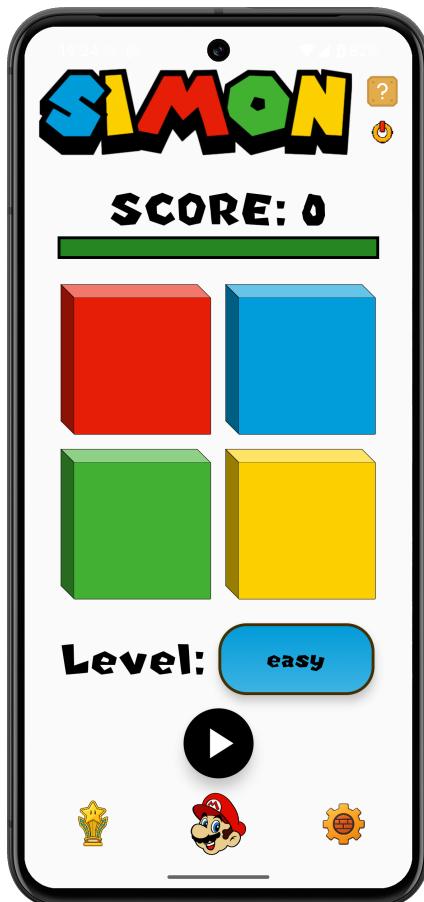


Figure 2: \*  
Mario Game Page



Figure 3: \*  
Mario Settings Page

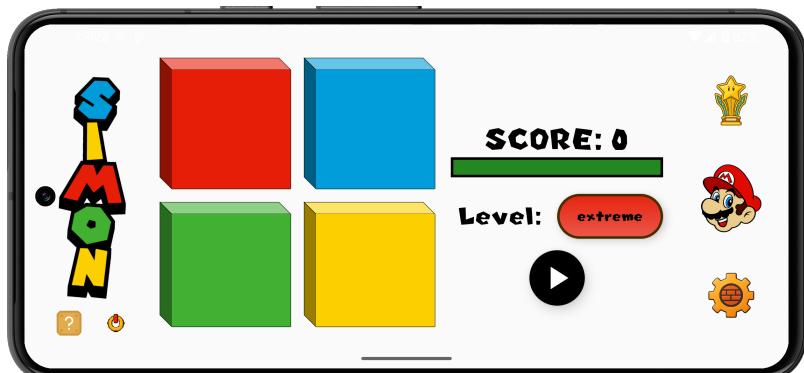


Figure 4: Landscape mode

## 2.2 Bart Theme

It is inspired by the cartoon: The Simpsons.

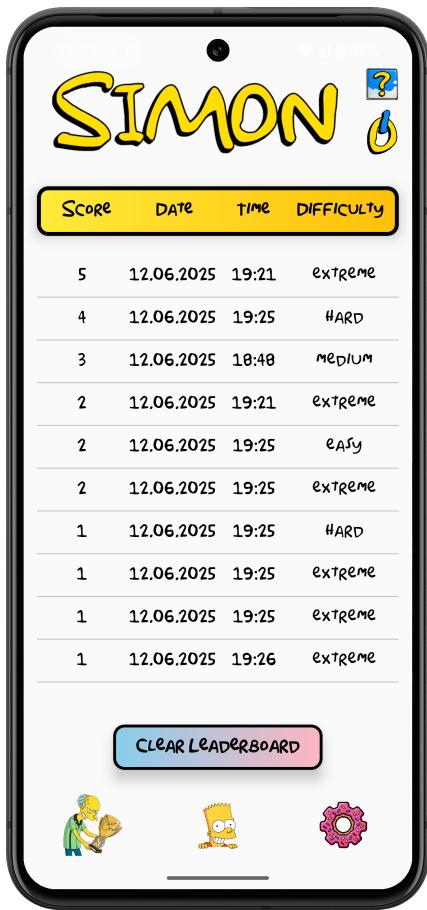


Figure 5: \*  
Bart Leaderboard Page



Figure 6: \*  
Bart Game Page

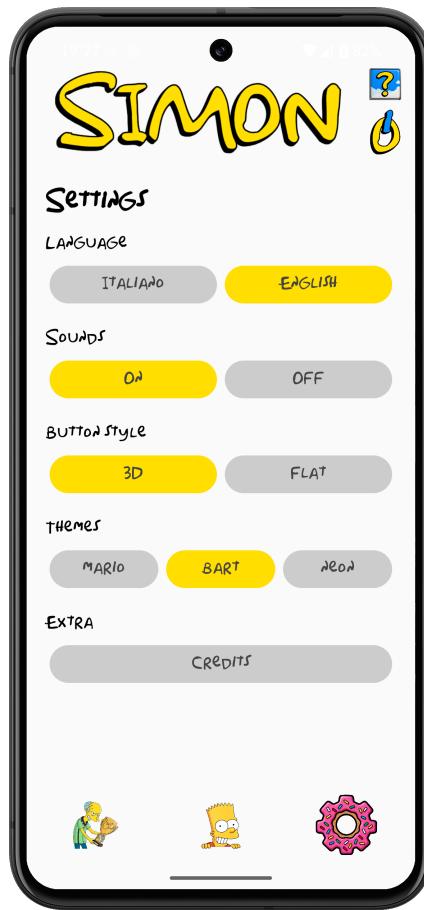


Figure 7: \*  
Bart Settings Page

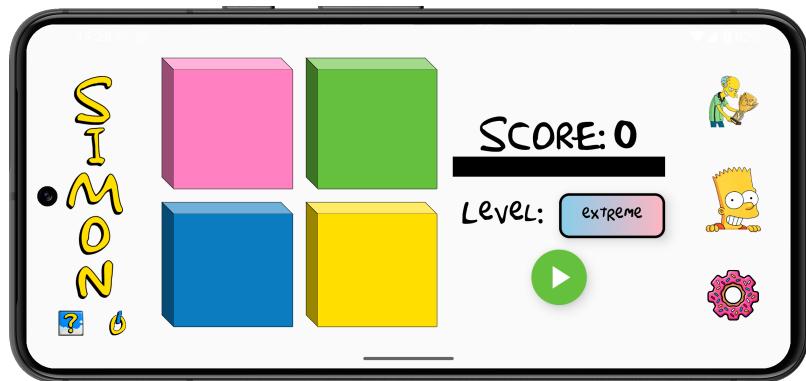


Figure 8: Landscape mode

## 2.3 Neon Theme

It is a minimal theme, characterized by glow colors and relaxing sounds.



Figure 9: \*  
Neon Leaderboard Page

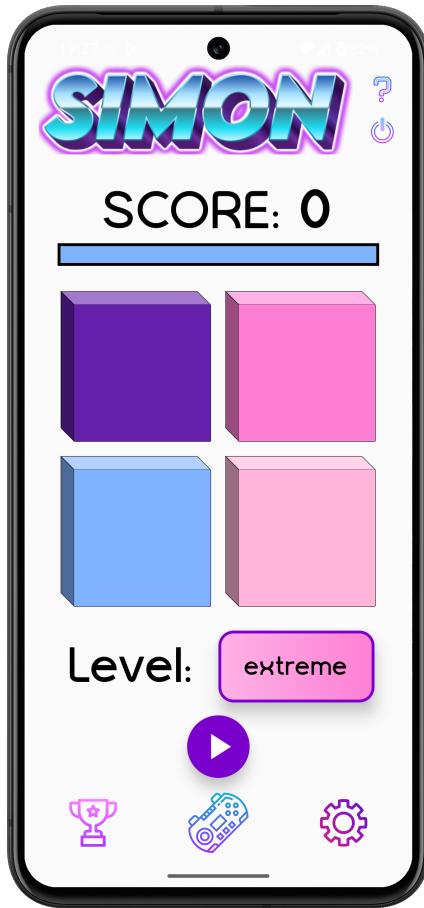


Figure 10: \*  
Neon Game Page

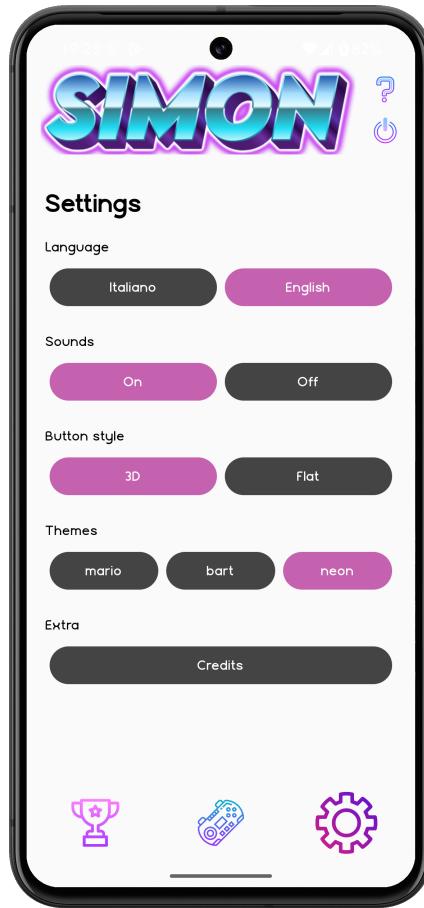


Figure 11: \*  
Neon Settings Page

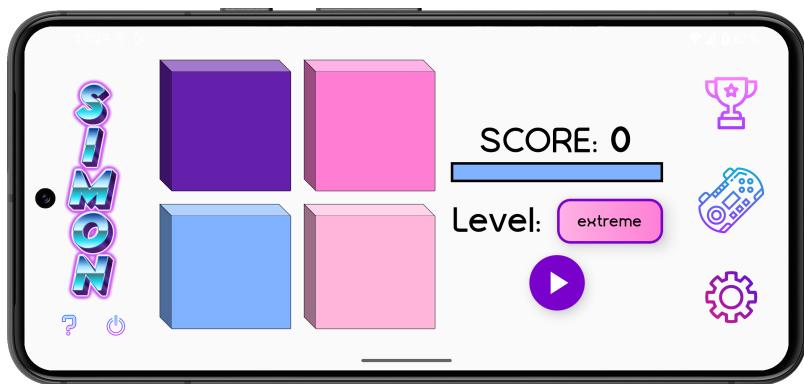


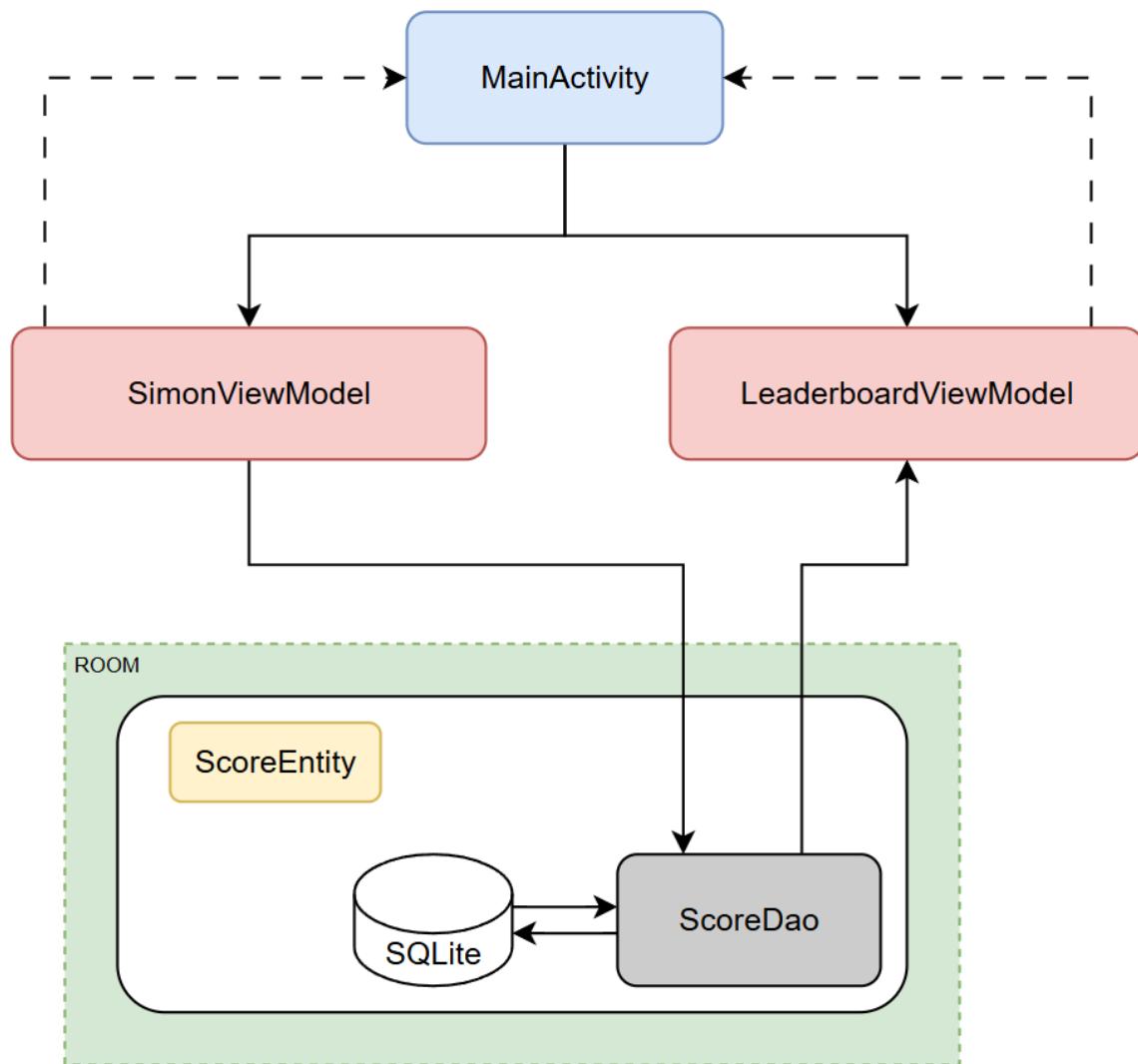
Figure 12: Landscape mode

As we can see in the images, the app adapts its look based on landscape/portrait mode. It is also responsive and can be used on phones of different sizes.

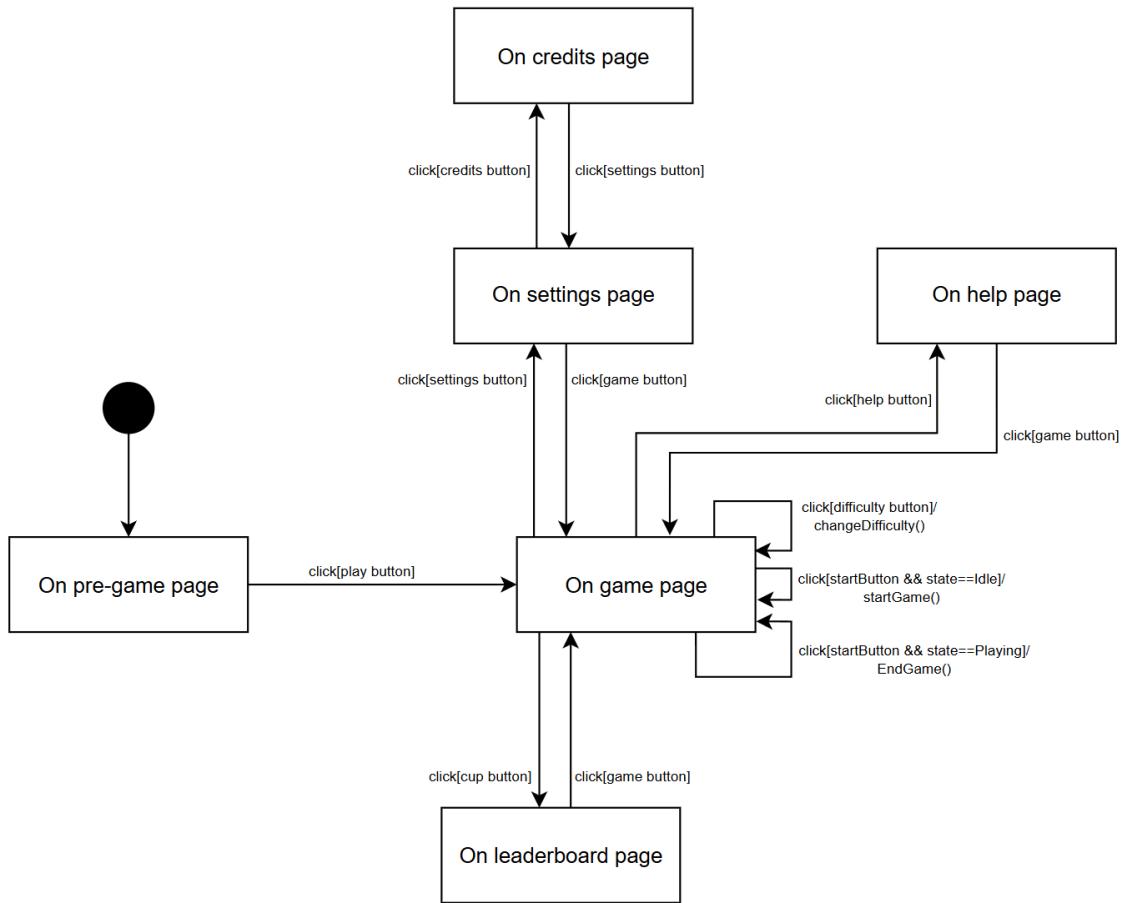
### 3 Design

#### 3.1 Design Diagram

For the realization of this software we used the following architecture



### 3.2 Activity Diagram



The final state of the diagram is not showed in this image, because it is accessible by every page and it would have been difficult to represent. From every page, the user can click on the quit button and it will close the app.

## 4 Testing and Benchmarks

### 4.1 Testing

In order to test the application, we made an early restricted release to only selected users. The software has been tested on the following android devices:

Phone brand	Model	Screen Size	Versione Android
Samsung	galaxy A35	6,6"	15
Google	pixel 8	6,2"	16
Samsung	galaxy S24 Ultra	6,8"	15
Google	pixel 9	6,3"	16
Honor	70	6,67"	15
Honor	magic 5 lite	6,67"	15
Samsung	galaxy A54	6,4"	15
Honor	8	5,2"	7
Google	pixel 8 pro	6,7"	15
Samsung	galaxy S21FE	6,4"	14

The app has been tested also on the following AVD: Small Phone, Medium Phone.  
The has been used on portrait and landscape mode and passed the test on every tested phone.  
No bugs were found.

## 4.2 Benchmark

### 4.3 Track Memory Consumption



As we can see in the plot, the memory consumption remains stable around 200MB during the use of the main functionalities of the software.

Furthermore, looking at the plot, we can see that the stack parameters is never shown. It means that Stack consumption does not have significant fluctuations, so theoretically it should be unlikely to have app crashes due to stack growth.