Software Requirements Specification

for

Chess And Checkers

**Version 1.0 approved**

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**<Section No. 5216>**

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**Revision History**

| **Name** | **Date** | **Reason For Changes** | **Version** |
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|  |  |  |  |

# Introduction

## Purpose

This document outlines all of the software requirements for the Chess and checkers game. These specifications cover the system's functionality, limitations, performance, attributes, and user interface.

The Chess/checkers app is a game-playing program. The app will allow two users or players to play at the same time. The game can be played interactively from afar. The program will be designed in a way that it becomes user friendly. The release number of this game is 1.0.

## Document Conventions

No particular writing conventions used in this document, however the font size used is 12 and font used is Times.

## Intended Audience and Reading Suggestions

This document is basically targeted towards the developers so that they could go through the technical stuff, and understand the application with respect to their own domain.

The document contains 6 parts which includes introduction, the overall description of the project, the external interface requirements, system features, nonfunctional requirements, and other requirements.

## Product Scope

This part will contain a brief description and scope of both chess and checkers games. Chess, a strategic checkered board game, is played by two individuals with the objective of seizing the opponent’s king. It’s a very popular game among the people, nationally and internationally.

Checkers, also referred to as draughts is also a checkerboard game in which each player begins with twelve pieces arranged in three rows down one side of the board, that moves diagonally to capture the opponents’ pieces.

Following document extensively explains all the features, functions, and constraints of the program.

The scope of this project is to facilitate the user with a chess/checkers game that is intuitive, reliable, and entertaining for players of all skills.

## References

The following are the websites and the links from where the document has referred.

1. [Chess.com](https://www.chess.com/)
2. [How to play chess](https://www-instructables-com.cdn.ampproject.org/v/s/www.instructables.com/Playing-Chess/?amp_js_v=a6&amp_gsa=1&amp_page=true&usqp=mq331AQKKAFQArABIIACAw%3D%3D%23aoh=16340588549145&csi=1&referrer=https%3A%2F%2Fwww.google.com&amp_tf=From%20%251%24s&ampshare=https%3A%2F%2Fwww.instructables.com%2FPlaying-Chess%2F#ampshare=https%3A%2F%2Fwww.instructables.com%2FPlaying-Chess%2F)
3. [Learn How to Play Checkers](https://www.thesprucecrafts.com/play-checkers-using-standard-rules-409287)
4. [Performance Requirements – Non Functional Requirements Example](https://t4tutorials.com/performance-requirements/?amp)

# Overall Description

## Product Perspective

This game is a follow-on member of the “chess and checker” game family. It is designed by considering the previous versions of this game(either as desktop or mobile application). Our aim is to design this game in such a way that it would be visually appealing to the user, providing maximum functionalities and an interactive user interface that would give an exposure of a real-life chess board.

## Product Functions

The system must provide, at a minimum, of following functions to the user/player:

* Players can login or register themselves via google, Facebook, game center and email.
* The user can use the functionality of “forgot password”.
* The user can deactivate their personal accounts.
* The user can adjust the quality of graphics and volume through the game settings option.
* Players can invite, add and remove their friends.
* Players can learn the rules of the game through tutorials and can practice the moves through puzzles.
* The user can view the recent news regarding chess and chess tournaments via community channel.
* Quit and restart the game. In multiplayer games, consent of both players is required to do so.
* Chatting option is provided in a multiplayer game.
* Play as single player or multiplayer.
* Select the color of the board and pieces.
* Select the avatar.
* Record overall standings.
* Switch the difficulty levels when playing as a single player.
* Record replays.
* View the replays of previously played games.
* Access this application via mobile and desktop.
* The user can take part in tournaments in a multiplayer as well as single player game.
* The user can upgrade and unlock the resources such as chess pieces and chess board color, using their in-game currency.

## User Classes and Characteristics

The users of this application are anyone above 15 years. Research reveals that 78% of regular chess players are university graduates as well as university students. This game can be played by anyone who is aware of the game rules.

## Operating Environment

About the server side, this game may be hosted on firebase or cloudflare and might use their protocols for optimal operation. These protocols may include HTTP/HTTPS, SSL, TLS, FTP etc.

On the user side, it will operate in any operating system that can run a browser. Browsers include Safari, Chrome, Microsoft Edge, Internet Explorer, Mozilla Firefox, Opera and others.

## Design and Implementation Constraints

Developers need to implement different themes and color contrasts. They need to make sure that they follow color theory for soothing user experience. Developers also need to work around the best practices suggested by the hosting service being used to deploy the app.

## User Documentation

Target audience for this game is basically anyone over a certain age. The instructions and guidelines will be given in the form of an in-game tutorial which can be accessed from the learn game. This tutorial will auto run on the first login and walk the new user through all the app features and game rules.

## Assumptions and Dependencies

It is assumed that the user is connected to the internet for log in/sign up purposes. Internet connection is also needed to load and update player stats and progress. Also, for the online multiplayer functionality, the user must have an active internet connection to play with other players. Internet connection is not necessary for offline multiplayer. A functionality may be added which helps players not lose a match instantly if they get disconnected for a small period during the game. This functionality may work using random calculated moves.

# External Interface Requirements

## User Interfaces

*<Describe the logical characteristics of each interface between the software product and the user. This may include sample screen images, any GUI standards or product family style guides that are to be followed, screen layout constraints, standard buttons and functions (e.g., help) that will appear on every screen, keyboard shortcuts, error message display standards, and so on. Define the software components for which a user interface is needed. Details of the user interface design should be documented in a separate user interface specification.>*

## Hardware Interfaces

*<Describe the logical and physical characteristics of each interface between the software product and the hardware components of the system. This may include the supported device types, the nature of the data and control interactions between the software and the hardware, and communication protocols to be used.>*

## Software Interfaces

*<Describe the connections between this product and other specific software components (name and version), including databases, operating systems, tools, libraries, and integrated commercial components. Identify the data items or messages coming into the system and going out and describe the purpose of each. Describe the services needed and the nature of communications. Refer to documents that describe detailed application programming interface protocols. Identify data that will be shared across software components. If the data sharing mechanism must be implemented in a specific way (for example, use of a global data area in a multitasking operating system), specify this as an implementation constraint.>*

## Communications Interfaces

*<Describe the requirements associated with any communications functions required by this product, including e-mail, web browser, network server communications protocols, electronic forms, and so on. Define any pertinent message formatting. Identify any communication standards that will be used, such as FTP or HTTP. Specify any communication security or encryption issues, data transfer rates, and synchronization mechanisms.>*

# System Features

Following are the system features of this application:

* Login
* Game Settings
* Friend System
* Shop
* Account Data
* Learn Game
* Community Channel
* Play Game

## 4.1 Login and Register

### 4.1.1 Description and Priority

This feature includes the Logging in and Registration part of the game. The features allow an access to the game via verifying new or past players by providing linking to social media apps like Facebook, email, google etc. This feature has high priority since not only does it ensure security and integrity of the application it also allows users to create progress with use of scoreboards that aids in online game matchmaking.

### 4.1.2 Stimulus/Response Sequence

Stimulus: The moment the application is started, the user is made available to a page with multiple login or registration methods.

Response: Depending on the chosen button the user may register or login and then be immediately navigated to the “Play Game” screen.

### 4.1.3 Functional Requirements

REQ 1.1

| Use Case Name | Register | |
| --- | --- | --- |
| Related Requirements | REQ: 1.2, 1.3 | |
| Goal in context | The user will request the app to register them as a player. | |
| Preconditions | The user will request the app to register them as a player. | |
| Successful End Conditions | User is successfully registered and will be able to log in | |
| Failed End Conditions | User is not registered. | |
| Primary Actors | User | |
| Secondary Actors | Database | |
| Trigger | Player chooses the register option. | |
| Included Cases | Verify User. | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks on register |
| 2 | User chooses the registration method. (Email, Google, Facebook) |
| 3 | User enters his credentials |
|  | 4: include verify user | User receives a verification email |
|  | 5 | User registration is confirmed after verification |

REQ 1.2

| Use Case Name | Verify User | |
| --- | --- | --- |
| Related Requirements | REQ: 1.1 | |
| Goal in context | The app will verify the user email by sending a verification email. | |
| Preconditions | The User needs to be connected to the internet. | |
| Successful End Conditions | User registration is successfully verified and hence completed. | |
| Failed End Conditions | User registration is not verified thus not completed. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Player presses the register now button after inputting credentials. | |
| Included Cases | Verify User. | |
| Main Flow | Steps | Actions |
|  | 1 | User enters their credentials and clicks on the register. |
| 2 | User receives an email. |
| 3 | User clicks on the verification link and sees the registration confirmation dialogue. |

REQ1.3

| Use Case Name | Login | |
| --- | --- | --- |
| Related Requirements | REQ: 1.4, 1.5 | |
| Goal in context | User requests the app to log into their profile using the right credentials. | |
| Preconditions | The user must be registered in the game and the credentials of the user must exist in the Game Database. | |
| Successful End Conditions | The user successfully logs into the game. | |
| Failed End Conditions | The user is not able to log in and sees a login error dialogue. | |
| Primary Actors | User | |
| Secondary Actors | Database | |
| Trigger | Clicking the “Login” button/tab. | |
| Included Cases | Display login error | |
| Main Flow | Steps | Actions |
|  | 1 | User opens the app |
| 2 | User Clicks on the “Login” tab/button |
| 3 | User sees different options to log into the game |
|  | 4: include (if entered wrong credentials) Display log in error | An error message is displayed if password/username is wrong. |

REQ 1.4

| Use Case Name | Guest User | |
| --- | --- | --- |
| Related Requirements | REQ: 1.3 | |
| Goal in context | A user requests to play the game as a guest without signing up or logging in. | |
| Preconditions | The user should be connected to the internet if they are playing as a guest for the first time on a device. Internet connection is not necessary if they have not changed their device and have already played as a guest at least once. | |
| Successful End Conditions | User can play the game as a guest | |
| Failed End Conditions | User cannot play the game as a guest | |
| Primary Actors | User | |
| Secondary Actors | Database | |
| Trigger | Clicking the ”Guest” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User opens the app |
| 2 | User chooses the play as a guest option. |
| 3 | The user is able to play. |

REQ 1.5

| Use Case Name | Forgot password | |
| --- | --- | --- |
| Related Requirements |  | |
| Goal in context | User requests the game to reset the password | |
| Preconditions | The user must be already registered. | |
| Successful End Conditions | The user successfully resets the password and logs in. | |
| Failed End Conditions | The user is not able to log in and is given more recovery options. | |
| Primary Actors | User | |
| Secondary Actors | Database | |
| Trigger | Clicking the “forgot password” button. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “forgot password button” |
| 2 | App asks for email. |
| 3 | User enters an email. |
| 4 | Enter the new password. |

## 

## 4.2 Game Settings

### 4.2.1 Description and Priority

This feature includes the setting of the environment related attributes. This feature lets the user decide the volume, graphics and the events which should be notified, or which should not be notified. This feature should have a high priority. The game can work without deciding on these features, but the user will not be at ease, for example volume keeps increasing, decreasing disturbing user or surrounding, same goes for graphics and notification. It should have medium priority.

### 4.2.2 Stimulus/Response Sequence

Stimulus: As soon as the user opens the app (after logging in or as a guest), he sees a small button of the game setting at the bottom.

Response: Choosing this feature, the game displays some options to let users decide the Volume coming from the system, the Graphic, quality of the display on the screen, and the notification should be given or not on certain events as per user preferences.

### 4.2.3 Functional Requirements

REQ 2.1:

| Use Case Name | Game Settings | |
| --- | --- | --- |
| Related Requirements | REQ: 2.2, 2.3, 2.4 | |
| Goal in context | To request the app to change the current settings of the game. | |
| Preconditions | The user must be logged in with the correct credentials and should be ready to play the game. | |
| Successful End Conditions | The user has successfully changed the settings of the game. | |
| Failed End Conditions | The user is not able to change the settings. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Game Settings” button/tab. | |
| Included Cases | Graphics, Notifications, Volume | |
| Main Flow | Steps | Actions |
|  | 1 | User Logs into the game. |
| 2 | User Clicks on the “Game Settings”  tab/button |
| 3: includes  Graphics, Notification,  Volume. | User sees the available options(Volume, notifications, graphics) in the Game Settings. |

REQ 2.2:

| Use Case Name | Notifications | |
| --- | --- | --- |
| Related Requirements | REQ: 2.1 | |
| Goal in context | To request the user to open the app and play. | |
| Preconditions | The user must be logged in with the correct credentials and should be ready to play the game.  User must have clicked the “Game Settings” tab/button | |
| Successful End Conditions | User can now select from the available options for Game Notifications | |
| Failed End Conditions | The user is not able to view the notifications. | |
| Primary Actors | Game | |
| Secondary Actors | User | |
| Trigger | Clicking the “Notification Settings” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User Logs into the game. |
| 2 | User Clicks on the “Game Settings”  tab/button |
| 3 | User Clicks on the “Notification Settings” tab/button |

REQ 2.3:

| Use Case Name | Volume | |
| --- | --- | --- |
| Related Requirements | REQ: 2.1 | |
| Goal in context | To request the app to change the volume. | |
| Preconditions | The user must be in game settings. | |
| Successful End Conditions | The user can now increase or decrease the volume levels. | |
| Failed End Conditions | The user cannot change the volume. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the volume settings button | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User enters games settings |
| 2 | User clicks on volume settings |
| 3 | User makes the preferred changes. |

REQ 2.4:

| Use Case Name | Graphics settings | |
| --- | --- | --- |
| Related Requirements | REQ: 2.1 | |
| Goal in context | To request the app to change the graphics quality. | |
| Preconditions | User must be in game settings | |
| Successful End Conditions | The user can now adjust graphics as per his wishes. | |
| Failed End Conditions | The user cannot adjust the graphics settings. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Click the graphics settings button. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the game settings |
| 2 | User goes into graphics settings |
| 3 | User adjusts according to his choice. |

## 4.3 Friend System

### 4.3.1 Description and Priority

This feature includes inviting, adding and removing friends. This feature lets the user maintain his/her friend circle. This feature should have a low priority. The game can work without deciding these features, but the user can improve his overall experience and enjoy this game with his friends if he uses this feature.

### 4.3.2 Stimulus/Response Sequence

Stimulus: As soon as the user opens the app (after logging in or as a guest), he sees a button on the friend system.

Response:Choosing this feature, a new window opens up. It shows a table of friends, and three buttons which are “Invite Friends”, “Add Friends”, and “Remove Friends”.

### 4.3.3 Functional Requirements

REQ 3.1

| Use Case Name | Friend System | |
| --- | --- | --- |
| Related Requirements | REQ: 3.2, 3.3, 3.4 | |
| Goal in context | To request the app to allow the user to invite, add and remove friends. | |
| Preconditions | The user must be logged in via correct credentials.  Active internet connection is required to invite, remove or add friends. | |
| Successful End Conditions | The user can now play the game with his friends and can share his overall standing with them. | |
| Failed End Conditions | The user cannot change the friend's details. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Friend System” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “Friend System” button/tab. |
| 2 | Various options of inviting, adding or removing friends appear. |
| 3 | User does the preferred tasks. |

REQ 3.2:

| Use Case Name | Invite Friend | |
| --- | --- | --- |
| Related Requirements | REQ: 3.1 | |
| Goal in context | To request the app to allow the user to invite their friends. | |
| Preconditions | The user must be at the “Friend System” page. | |
| Successful End Conditions | The user is able to invite his friends. | |
| Failed End Conditions | User is unable to invite his friends. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Invite Friend” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “Invite Friend” button/tab. |
| 2 | Invitation link is copied to the clipboard. |

REQ 3.3:

| Use Case Name | Remove Friend | |
| --- | --- | --- |
| Related Requirements | REQ: 3.1 | |
| Goal in context | To request the app to let the user remove their friends. | |
| Preconditions | The user must be at the “Friend System” page. | |
| Successful End Conditions | The user is able to remove his friends from the friend list. | |
| Failed End Conditions | User is unable to remove his friends from the friend list. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Remove Friend” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the friend he wants to remove from the Friend’s List. |
| 2 | User clicks the “Remove Friend” button/tab. |

REQ 3.4:

| Use Case Name | Add Friend | |
| --- | --- | --- |
| Related Requirements | REQ: 3.1 | |
| Goal in context | To request the app to allow the user to add friends. | |
| Preconditions | The user must be at the “Friend System” page. | |
| Successful End Conditions | The user is able to add his friends to the friend’s list. | |
| Failed End Conditions | User is unable to add his friends. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Add Friend” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “Add Friend” button/tab. |
| 2 | New window is opened with the search bar. |
| 3 | User finds his friend through his username and selects to add friend to the friend’s list. |

## 4.4 Shop

### 4.4.1 Description and Priority

This feature includes unlocking resources. This feature lets the user shop a variety of chess pieces and different color boards. This feature should have a low priority. The game can work without unlocking new resources, but the user can improve his overall experience by using this feature.

### 4.4.2 Stimulus/Response Sequence

Stimulus:As soon as the user opens the app (after logging in or as a guest), the user sees a small button of the shop on the top.

Response: Choosing this feature, a new window opens up. It shows locked resources and allows the user to unlock them if the user has enough in-game currency.

### 4.4.3 Functional Requirements

REQ 4.1

| Use Case Name | Shop | |
| --- | --- | --- |
| Related Requirements | REQ: 4.2 | |
| Goal in context | To request the app to allow the user to shop the items from using in-game currency. | |
| Preconditions | The user must be logged in via correct credentials.  Active internet connection is required to shop. | |
| Successful End Conditions | The user can shop and unlock new resources. | |
| Failed End Conditions | The user is unable to shop. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Shop” button/tab. | |
| Included Cases | Unlock Resources | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “shop” button/tab. |
| 2: Include Unlock Resources | The option of “Unlock Resources” appears, and the user unlock the resources. |

REQ 4.2

| Use Case Name | Unlock Resources | |
| --- | --- | --- |
| Related Requirements | REQ: 4.1 | |
| Goal in context | To request the app to unlock the resources using in-game currency. | |
| Preconditions | The user must be logged in via correct credentials.  Active internet connection is required to shop. The user must have enough in-game currency to unlock specific resources. | |
| Successful End Conditions | The user can unlock new resources. | |
| Failed End Conditions | The user is unable to unlock resources. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Unlock Resource” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | The user clicks the specific resource he/she wants to unlock. |
| 2 | User clicks ‘’Unlock Resource’’. |

## 4.5 Account Data

### 4.5.1 Description and Priority

This feature includes the saved data of the user. This feature has medium importance since the in game currency, used in the shop, can only be gathered by playing the game. If this feature were to be absent, the user would not be able to buy resources at the shop. The user may lack interest if this feature is not present. Furthermore this feature also holds user data pertaining to the amount of matches won and lost, saved replays and a number of customization options to enhance user experience in competitive play.

### 4.5.2 Stimulus/Response Sequence

Stimulus:After the user logs in they would be able to see their in game currency and a button for “Account Data”.

Response: After the user presses the button the user is navigated towards a window for viewing past game replays, customizing avatars, altering available color schemes or even deleting an account!

### 4.5.3 Functional Requirements

REQ 5.1

| Use Case Name | Account Data | |
| --- | --- | --- |
| Related Requirements | REQ: 5.2 | |
| Goal in context | To request the app to allow the user to view their account data. | |
| Preconditions | The user must be logged in via correct credentials.  Active internet connection is required for a multiplayer game. | |
| Successful End Conditions | The user can now play the game after making the preferred changes to the appearance and can see user stats. | |
| Failed End Conditions | The changes the user wants to make are not available, e.g., preferable color etc. and cannot see their stats. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Account Data” button/tab. | |
| Included Cases | In-Game Currency, Profile Setting | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “Account Data” button/tab. |
| 2 | Option to view over all account data. |
| 3: include profile settings | Various options of setting/changing the current profile settings appear. |
| 4 | User makes the preferred changes. |

REQ 5.2

| Use Case Name | Profile Setting | |
| --- | --- | --- |
| Related Requirements | REQ: 5.1 | |
| Goal in context | To request the app to allow the user to make preferred changes in the game profile. | |
| Preconditions | The user must be logged in via correct credentials.  Active internet connection is required for a multiplayer game. | |
| Successful End Conditions | The user can now play the game after making the preferred changes to the appearance to the game. | |
| Failed End Conditions | The user cannot make his preferred changes or cannot view replays and stats. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Set Profile” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “Set Profile” button/tab. |
| 2 | Various options of setting/changing the current profile settings appear. |
| 3 | User makes the preferred changes. |

REQ 5.3

| Use Case Name | Set Avatar | |
| --- | --- | --- |
| Related Requirements | REQ: 5.2 | |
| Goal in context | To request the app to allow the user to change their avatar. | |
| Preconditions | The user must be at the “Set Avatar” page. | |
| Successful End Conditions | The avatar is now selected as per user’s choice. | |
| Failed End Conditions | The user is not able to change the avatar. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Set Avatar” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “Set Avatar” button/tab. |
| 2 | New page is opened with multiple avatars to choose from. |
| 3 | User chooses the desired avatar. |

REQ 5.4

| Use Case Name | Set Colors | |
| --- | --- | --- |
| Related Requirements | REQ: 5.2 | |
| Goal in context | To request the app to allow the user to change the color of the chess board. | |
| Preconditions | The user must be at the “Set Profile” page. | |
| Successful End Conditions | The color of the chess board is now changed as per user’s choice. | |
| Failed End Conditions | The user is not able to change the color of the chess board. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Set Colors” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “Set Colors” button/tab. |
| 2 | New page is opened with multiple color combinations to choose from. |
| 3 | User chooses the desired color combination. |

REQ 5.5

| Use Case Name | View Statistics | |
| --- | --- | --- |
| Related Requirements | REQ: 5.2 | |
| Goal in context | To request the app to allow the user to view the leaderboard/statistics. | |
| Preconditions | The user must be at the “View statistics” page. | |
| Successful End Conditions | Overall game statistics are displayed on the screen. | |
| Failed End Conditions | The overall statistic is not displayed or some part is missing | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “View Statistics” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “View Statistics” button/tab. |
| 2 | New page is opened displaying the overall performance and statistics of the game and the user. |
| 3 | User can view the statistics. |

REQ 5.6

| Use Case Name | View Replays | |
| --- | --- | --- |
| Related Requirements | REQ: 5.2 | |
| Goal in context | To request the app to allow the user to view the replays of their previous games. | |
| Preconditions | The user must be at the “View Replay” page. | |
| Successful End Conditions | The user can view complete replays of their previously played games. | |
| Failed End Conditions | The user can not view the replays. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “View Replay” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “View Replay” button/tab. |
| 2 | New page is opened with the option for which match game the replay will be shown. |
| 3 | User chooses the metch. |

REQ 5.7

| Use Case Name | Delete Account | |
| --- | --- | --- |
| Related Requirements | REQ: 5.2 | |
| Goal in context | To request the app to allow the user to delete the gaming account. | |
| Preconditions | The user must be at the “Delete Account” page. | |
| Successful End Conditions | The account is deleted as per user’s choice. | |
| Failed End Conditions | User’s account is not deleted. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Delete Account” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “Delete Account” button/tab. |
| 2 | Gives the warning that the account is being deleted. |
| 3 | User account is deleted. |

## 4.6 Learn Game

### 4.6.1 Description and Priority

“Learn game” is one of the features of this game. It is of low priority as the game can still be played without this feature. The Learn Game is composed of two parts. The first part is a puzzle. Puzzle helps a player to enhance his skill of choosing the next best move in the middle of an already played game by any other user. This will help the player in making right decisions during an actual game. The second part is a tutorial. Tutorial will contain a set of instructions containing game rules and policies. This tutorial can be viewed before starting the game as well as anytime during the game.

### 4.6.2 Stimulus/Response Sequence

Stimulus: After logging in, the user will be able to see multiple buttons one of which is Learn game in the bottom status bar.

Response: After clicking this button, the user gets two options, tutorial and puzzle to learn and practice the game.

### 4.6.3 Functional Requirements

REQ 6.1

| Use Case Name | Learn Game | |
| --- | --- | --- |
| Related Requirements | REQ: 6.2, 6.3 | |
| Goal in context | To request the app to allow the user to learn the game via provided options. | |
| Preconditions | The user must be logged in via correct credentials. | |
| Successful End Conditions | The user now knows how to play the game. | |
| Failed End Conditions | The user doesn’t know how to play the game. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Learn Game” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “Learn Game” button/tab. |
| 2 | Two options will appear. Tutorial and puzzle |
| 3 | User will choose one option. If tutorial, then an offline tutorial video will appear. If Puzzle, then a sample game will appear where user will choose the next steps to learn how to play the game. |

REQ 6.2

| Use Case Name | Tutorial | |
| --- | --- | --- |
| Related Requirements | REQ: 6.1 | |
| Goal in context | To request the app to allow the user to view the game tutorial. | |
| Preconditions | User must have clicked the tab of ‘Learn Game’. | |
| Successful End Conditions | The user can view the tutorial. | |
| Failed End Conditions | The user cannot view the tutorial. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Tutorial” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “Tutorial” button/tab. |
| 2 | A tutorial will appear on how to play the game. |

REQ 6.3

| Use Case Name | Puzzle | |
| --- | --- | --- |
| Related Requirements | REQ: 6.1 | |
| Goal in context | To request the app to allow the user to play the puzzle for practicing the moves. | |
| Preconditions | User must have clicked the tab of ‘Learn Game’. | |
| Successful End Conditions | The user can play the puzzle game. | |
| Failed End Conditions | The users cannot play the puzzle game. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Puzzle” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “Puzzle” button/tab. |
| 2 | A sample puzzle game will appear where the user has to choose the best possible option to move. |

## 4.7 Community Channel

### 4.7.1 Description and Priority

This feature allows the community to be connected with one another whether in the form of tournaments happening nearby or NEWS related to chess. Basic purpose is to indulge the user with every information regarding the game and to increase the willingness of a person to play the game by letting them know about the challenges happening nearby so that they can participate. It will have low priority.

### 4.7.2 Stimulus/Response Sequence

Stimulus: As soon as the user opens the app (after logging in or as a guest), he sees a button labeled “community channel” in the bottom task bar.

Response: Choosing this feature, the game displays two options either to opt NEWS or tournaments nearby. This will lead the user to gain info regarding the game.

### 4.7.3 Functional Requirements

REQ 7.1

| Use Case Name | Community Channel | |
| --- | --- | --- |
| Related Requirements | REQ: 7.2, 7.3 | |
| Goal in context | To request the app to allow the user to view the chess community channel. | |
| Preconditions | The user must be logged in via correct credentials. | |
| Successful End Conditions | The user is able to go through the tournaments nearby and recent news regarding chess and checkers game | |
| Failed End Conditions | The user is not able to view the community channel. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “Community Channel” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “Community Channel” button/tab. |
| 2 | Different options regarding the chess community will appear. |
| 3 | User chooses the desired option to get information. |

REQ 7.2

| Use Case Name | NEWS | |
| --- | --- | --- |
| Related Requirements | REQ: 7.1 | |
| Goal in context | To request the app to allow the user to view the recent NEWS regarding chess/checker games. | |
| Preconditions | The user must have clicked the tab of ‘Community Channel’. Active internet connection is required. | |
| Successful End Conditions | The user is able to view the news. | |
| Failed End Conditions | The user cannot view the chess news. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking the “NEWS” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “NEWS” button/tab. |
| 2 | The news related to chess will appear like blogs and recent events related to chess. |
| 3 | User chooses the desired option/blog/article to get information. |

REQ 7.3

| Use Case Name | Tournament Nearby | |
| --- | --- | --- |
| Related Requirements | REQ: 7.1 | |
| Goal in context | To request the app to allow the user to view the tournaments happening. | |
| Preconditions | The user must have clicked the tab of ‘Community Channel’. Active internet connection is required. | |
| Successful End Conditions | The user can view the tournaments happening. | |
| Failed End Conditions | The user cannot view the tournaments happening. | |
| Primary Actors | User-1, User-2, AI | |
| Secondary Actors | None | |
| Trigger | Clicking the “Tournament Nearby” button/tab. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks the “Tournament Nearby” button/tab. |
| 2 | All the tournaments of chess will appear happening nearby. |
| 3 | User chooses the desired option to get information regarding the tournaments. |

## 4.8 Play The Game

### 4.8.1 Description and Priority

This feature includes the actual gameplay of both games. It lets the user decide its game choice, mode and medium leading to the gameplay. This feature should have a high priority.

### 4.8.2 Stimulus/Response Sequences

Stimulus: As soon as the user opens the app (after logging in or as a guest), he sees a button to play the game.

Response: Choosing this feature, the game displays some options to let the user decide the category and mode of the game he wants to play.

### 4.8.3 Functional Requirements

REQ 8.1:

| Use Case Name | Play Game | |
| --- | --- | --- |
| Related Requirements | REQ: 8.2,8.3, 8.10 | |
| Goal in context | User requests to move to the window where they need to choose which game he will play. | |
| Preconditions | User should be logged into his game account or via a guest account. | |
| Successful End Conditions | User will end up at the game choice menu | |
| Failed End Conditions | User not being able to choose the game he wants to play and stays at the main menu, | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Player clicks on “play game” button on main menu | |
| Included Cases | In-Game options | |
| Main Flow | Steps | Actions |
|  | 1 | User logs in to the game |
| 2 | Clicks on Play Game |
| 3 | A game choice menu opens |
|  | 4: include in game options | game will start after a few more steps that will include some in game options |

REQ 8.2

| Use Case Name | Play Chess | |
| --- | --- | --- |
| Related Requirements | REQ: 8.1,8.4,8.5 | |
| Goal in context | User requests to choose the chess game and ends up at the menu where the player must choose the game mode. | |
| Preconditions | User must be in the play game menu | |
| Successful End Conditions | User’s choice is catered and is asked for game mode. | |
| Failed End Conditions | User stays in the play game menu. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | User clicking on the “play chess” button | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicking play chess |
| 2 | New menu with game options opens. |

REQ 8.3

| Use Case Name | Play Checkers | |
| --- | --- | --- |
| Related Requirements | REQ: 8.1, 8.4, 8.5 | |
| Goal in context | User requests to choose the checkers game and ends up at the menu where the player must choose the game mode. | |
| Preconditions | User must be in the play game menu | |
| Successful End Conditions | User’s choice is catered and is asked for game mode. | |
| Failed End Conditions | User stays in the play game menu. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | User clicking on the “play checkers” button | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicking “play checkers” |
| 2 | New menu with game options opens |

Req 8.4

| Use Case Name | Play Multiplayer | |
| --- | --- | --- |
| Related Requirements | REQ: 8.2,8.3,8.6,8.7,8.8 | |
| Goal in context | The user requests the app to allow them to play in a multiplayer mode. | |
| Preconditions | User must have chosen what game he wants to play. | |
| Successful End Conditions | User checks the option for online or offline multiplayer and the game starts | |
| Failed End Conditions | User stays on the same menu. | |
| Primary Actors | User – 1, User - 2 | |
| Secondary Actors | None | |
| Trigger | User clicking on the multiplayer button | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | Click on Multiplayer |
| 2 | Multiplayer game mode is chosen |

REQ 8.5

| Use Case Name | Play with AI | |
| --- | --- | --- |
| Related Requirements | REQ: 8.2,8.3,8.6,8.9 | |
| Goal in context | To request the app to allow the user to play in single player mode. | |
| Preconditions | User must have chosen what game he wants to play and must be connected to the internet | |
| Successful End Conditions | User is asked for the difficulty level after which the game starts. | |
| Failed End Conditions | User stays on the same menu. | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | User clicking on the “Play with AI” button | |
| Included Cases | Choose level of difficulty | |
| Main Flow | Steps | Actions |
|  | 1 | Click on Play with AI |
| 2 | User chooses level of difficulty and game starts |
|  |  |

REQ 8.6

| Use Case Name | Tournament Mode | |
| --- | --- | --- |
| Related Requirements | REQ: 8.4,8.5 | |
| Goal in context | To request the app to allow the user to play a tournament with another player or with the system.. | |
| Preconditions | User must choose the game(chess/checkers) he/she wants to play. | |
| Successful End Conditions | The user can play the tournament. | |
| Failed End Conditions | The user cannot play the tournament. | |
| Primary Actors | User. | |
| Secondary Actors | None. | |
| Trigger | user must click on the “Tournament Mode” button. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks on the “Tournament Mode” button. |
| 2 | A new page opens showing the options of tournament(single/multiplayer). |
| 3 | User chooses the preferred option. |

REQ 8.7

| Use Case Name | Online Multiplayer | |
| --- | --- | --- |
| Related Requirements | REQ: 8.4 | |
| Goal in context | To request the app to allow the user to play the game with another player over the network. | |
| Preconditions | The user must be connected to the internet. They must have chosen online multiplayer game mode. | |
| Successful End Conditions | Gameplay starts online with a real player | |
| Failed End Conditions | Gameplay does not start, and user stays on the same menu | |
| Primary Actors | User – 1, User – 2 | |
| Secondary Actors | None | |
| Trigger | User clicking on the online multiplayer option | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User clicks on the online multiplayer option |
| 2 | Gameplay starts |

REQ 8.8

| Use Case Name | Offline Multiplayer | |
| --- | --- | --- |
| Related Requirements | REQ: 8.4 | |
| Goal in context | To request the app to allow the user to play the game with another user on the same device. | |
| Preconditions | User must have chosen the game category and mode. | |
| Successful End Conditions | The gameplay starts | |
| Failed End Conditions | Game does not start, and user stays on the same menu | |
| Primary Actors | User – 1, User -2 | |
| Secondary Actors | None | |
| Trigger | User choosing offline multiplayer mode or choosing multiplayer and not being connected to the internet. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | Clicking on the offline multiplayer |
| 2 | Game starts on the same device |
|  |  |

REQ 8.9

| Use Case Name | Choose Level of Difficulty | |
| --- | --- | --- |
| Related Requirements | REQ: 8.5 | |
| Goal in context | To request the app to allow a single player, play with AI in a competitive environment. | |
| Preconditions | The user must play with AI. This mode is not available in a multiplayer game. | |
| Successful End Conditions | The user can play in preferred difficulty mode. | |
| Failed End Conditions | User stays on the same menu. | |
| Primary Actors | User. | |
| Secondary Actors | None | |
| Trigger | Clicking “Play with AI” | |
| Included Cases | None. | |
| Main Flow | Steps | Actions |
|  | 1 | User chooses a level from a variety of options available. |
| 2 | Confirmation dialogue appears |
| 3 | Gameplay starts |

REQ 8.10

| Use Case Name | In Game Option | |
| --- | --- | --- |
| Related Requirements | REQ: 8.1, 8.11, 8.12, 8.13, 8.14 | |
| Goal in context | To request the app to allow the user to view the in-game options. | |
| Preconditions | The user must be in a game. | |
| Successful End Conditions | A window comes up that shows the possible settings the player can manage | |
| Failed End Conditions | No window pops up | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Clicking “Pause” or “Setting” | |
| Included Cases | Chat, Restart, Record Game and Quit. | |
| Main Flow | Steps | Actions |
|  | 1 | User Clicks “Pause”. |
| 2 | All the options become visible. |
|  | 3:includes  Chat, Quit, Record game and Restart. | User clicks on either chat, quit or restart depending on the scenario. |

REQ 8.11

| Use Case Name | Chat | |
| --- | --- | --- |
| Related Requirements | REQ: 8.10 | |
| Goal in context | To request the app to allow the user to chat with another player in online multiplayer mode. | |
| Preconditions | The user must be playing a game. | |
| Successful End Conditions | The Chat window comes on screen | |
| Failed End Conditions | Nothing happens | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Pressing “Chat” button | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | User Clicks “Chat” button. |
| 2 | A variety of preset messages and typing space is shown along with stickers. |
| 3 | The User chooses the sticker/ message they want or even type their message |
|  | 4 | The User sends the desired message. |

REQ 8.12

| Use Case Name | Restart | | |
| --- | --- | --- | --- |
| Related Requirements | REQ: 8.10 | | |
| Goal in context | To request the app to allows the user to restart the game;  Immediately if it is with AI  Ask Player 2 to agree to request, if so restarts. | | |
| Preconditions | The user must be on the in game settings option. | | |
| Successful End Conditions | The game ends and a new one starts. | | |
| Failed End Conditions | The game continues. | | |
| Primary Actors | User | | |
| Secondary Actors | None | | |
| Trigger | Pressing the “Restart” button on the settings menu | | |
| Included Cases | None | | |
| Main Flow | Steps | Actions | |
| (AI)The current game ends.  (With Player) A request is sent to player 2. | 1 | The User clicks the “Restart” button | |
| 2 | (AI) The current game ends. | (With Player) A request is sent to player 2. |
|  | 3 | (AI) The player is brought to a new same difficulty game. | (With Player) If Player 2 agrees the game restarts with the same player; otherwise the same game continues. |

REQ 8.13

| Use Case Name | Quit | |
| --- | --- | --- |
| Related Requirements | REQ: 8.10 | |
| Goal in context | The game being played ends and the user comes back to “Play Game” options | |
| Preconditions | user must be on the “in game settings” option. | |
| Successful End Conditions | The game ends. | |
| Failed End Conditions | The game continues | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Pressing the “Quit” button on the settings window | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | The User clicks the “Quit” button |
| 2 | The current game ends. |
| 3 | The user is brought to the “Play Game” screen. |

REQ 8.14

| Use Case Name | Record Game | |
| --- | --- | --- |
| Related Requirements | REQ: 8.10 | |
| Goal in context | To request the app to allow the user to record the rest of the game starting from the time the user chose to replay till the end which will be saved for viewing later. | |
| Preconditions | The user must be on the in-game settings option. | |
| Successful End Conditions | The Recording for the game starts | |
| Failed End Conditions | The record doesn’t start | |
| Primary Actors | User | |
| Secondary Actors | None | |
| Trigger | Pressing the “Record Game” option. | |
| Included Cases | None | |
| Main Flow | Steps | Actions |
|  | 1 | The User clicks the “Record Game” button |
| 2 | The game from the moment the user clicks the button is being recorded |
| 3 | After the game ends a new video is made available in the “view replays” record. |

# Other Nonfunctional Requirements

## Performance Requirements

Performance requirements define how well the software system accomplishes certain functions under specific conditions. It also explains how the game is performing on mobile and desktop, or on different operating systems (varying environments).

**Performance Requirements for Individual Functional Requirements:**

* The movement of chess pieces from one block to another takes time up to 1 sec.
* The data structure used for making board will be a 2d array board (changing background color of each cell for color of board, icons for pieces)
* The overall game will be developed in 2 months of time.
* The game objects: replay, overall standing (will be saved on your own device)
* Single player mode: should use functional AI as an opponent.
* Multiplayer mode: AI will be replaced with a human opponent.
* For replay record a text file will be maintained, for example text file will follow the format:

o Rook C3----C4

o Pawn G7

o Queen B7---B9

* The overall standing will be saved in a text file (showed in a tabular form)
* Images of avatar and chess pieces, with .png or .jpeg as extensions, will be saved and retrieved when the game is first set up.
* Different AI Algorithms will be used
* Data structure will be used for storing possible moves
* To make sure the game works with different languages it will maintain different files for different languages.

## 5.2 Safety Requirements

-not needed

## 5.3 Security Requirements

The login credentials, by each user must be kept secured, providing full confidentiality. Furthermore, it’s important to make sure hackers should not be able to access a user's device through game, we can make this possible by having strong firewalls.

## 5.4 Software Quality Attributes

* The language used in this project is JavaScript, which is open-standard and open-source. This will make the code easily maintainable. A larger community will take interest in an open-source program.
* Game can adapt to the local language of the user and can run on Windows and Linux.
* It will save the replay record and current position if connection is lost. Gameplay will continue using random allowed moves.
* It will follow chess and checker rules and cannot allow the user to go beyond it.
* It can run on mobile and desktop.
* It can be updated with frequent updates.
* If the system crashes, it will be restored within 24 hrs.

## 5.5 Business Rules

The rules in the game are of three types,

1. Rules specific only to chess

2. Rules specific only to checkers

3. Rules applied on every gamer on the platform

### Chess’s Rules:

**Turns:** White always moves first, and players alternate turns. Players can only move one piece at a time, except when castling.

**Taking Pieces:** Players take pieces when they encounter an opponent in their movement path. Only pawns take differently than they move (explained later). Players cannot take or move through their own pieces.

**Pawn Movement:** Pawns only move forward. On the first move a pawn can move one or two spaces, every subsequent move can only be one space. Pawns move diagonally to take opponents.

**Pawn Promotion:**

If a pawn reaches the opposite side of the board, it is promoted to a higher piece (except king). There is no limit to how many pawns can be promoted.

**Rook Movement:** Rooks move in a continuous line forward, backwards, and side-to-side.

**Knight Movement:** Knights are the only pieces that "jump" off the board. Unlike other pieces they are not blocked if there are pieces between them and their destination square. To make it easier to remember how a knight moves, think of an L. Two spaces in a direction forward, backward, or side-to-side, and one space at a right turn.

**Bishop Movement:** Bishops move in continuous diagonal lines in any direction.

**Queen Movement:** The queen moves in continuous diagonal and straight lines. Forward, backward, and side-to-side.

**King Movement:** The king can move in any direction, one square at a time. A king cannot move to a square that is under attack by the opponent.

**Castling:** Castling is the only move that allows two pieces to move during the same turn.

During castling a king moves two spaces towards the rook that it will castle with, and the rook jumps to the other side. The king can castle to either side if:

1. The king has not moved.

2. The king is not in check.

3. The king does not move through or into check.

4. There are no pieces between the king and castling-side rook.

5. The castling-side rook has not moved.

It does not matter:

A. If the king was in check but is no longer.

B. If the rook can be attacked by an opponent's piece before castling.

**Special Move - En Passant:** En passant is a special movement for pawns attacking pawns. It only applies if your opponent moves a pawn two spaces, and its destination space is next to your pawn. You can take the opposing piece by moving forward-diagonal to your pawn's attacked square.

**Check:** A king is in check when an opponent's piece is in a position that can attack the king. A player must move their king out of check, block the check or capture the attacking piece. A player cannot move their king into check.

**Checkmate:** Putting an opponent's king in "checkmate" is the only way to win the game. A king is in checkmate if it is in check, the opponent's piece that has the king in check cannot be captured, the check cannot be blocked, and the king cannot move to a square that is not under attack.

**Stalemate:** It is achieved if there are no legal moves for a player to make.

### Checkers’ Rules:

**Move Only on Dark Squares:** Moves are allowed only on the dark squares, so pieces always move diagonally. Single pieces are always limited to forward moves (toward the opponent).

**Move Only One Square at a Time:** A piece making a non-capturing move (not involving a jump) may move only one square.

**Capture Pieces with Jumps:** A piece making a capturing move (a jump) leap over one of the opponent's pieces, landing in a straight diagonal line on the other side. Only one piece may be captured in a single jump; however, multiple jumps are allowed during a single turn.

**Remove Captured Pieces:** When a piece is captured, it is removed from the board.

**Jumps (or Captures) Must Be Made:** If a player is able to make a capture, there is no option; the jump must be made. If more than one capture is available, the player is free to choose whichever he or she prefers.

**How Pieces Become Kings:** When a piece reaches the furthest row from the player who controls that piece, it is crowned and becomes a king. One of the pieces which had been captured is placed on top of the king so that it is twice as high as a single piece.

**How Kings Move:** Kings are limited to moving diagonally but may move both forward and backward. (Remember that single pieces, i.e., non-kings, are always limited to forward moves.)

**Moving Kings vs. Single Pieces:** Kings may combine jumps in several directions, forward and backward, on the same turn. Single pieces may shift direction diagonally during a multiple capture turn but must always jump forward (toward the opponent).

General Rules:

1. Always two players in a game.
2. There are two prominent sides, with their own game pieces which can be exchanged.
3. On a certain turn only one side of the pieces can move, the other side’s pieces cannot be accessed.

# Other Requirements

The requirements that are not mentioned in the document but will be part of the system are mentioned below:

**Database requirements:**

The game will require a database to be designed that would store all the data related to a single game instance. While the game is played the database is used to store information about players’ actions and success rates. Our data model should cover both chess and checker.

**Internationalization Requirements:**

The game software will be prepared in a sense, so that it can support local languages and cultural settings.

**Appendix A: Glossary**

**A:**

Artificial Intelligence (AI): Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems.

Artificial intelligence software: Software that is capable of intelligent behavior.

**C:**

Constraints of the program: With any project, there are limitations and risks that need to be addressed to ensure the project's ultimate success.

**D:**

Developer: A developer is an individual that builds and creates software and applications. He or she writes, debugs, and executes the source code of a software application. A developer is also known as a software developer, computer programmer, programmer, software coder or software engineer.

Data structure: Data structure is a specialized format for organizing, processing, retrieving, and storing data. There are several basic and advanced types of data structures, all designed to arrange data to suit a specific purpose.

**F:**

Failed End Conditions: The conditions whose occurrence shows that the task in hand is incomplete. It's also known as error conditions.

Functions of the program: A set of instructions bundled together to achieve a specific outcome.

Functional Requirements: Functional requirements define the basic system behavior. Essentially, they are what the system does or must not do. They usually define ‘if/then’ behaviors and include calculations, data input, and business processes.

**G:**

Game-playing program: General game playing (GGP) is the design of artificial intelligence programs to be able to play more than one game successfully.

Goal in context: What each actor needs our system to do, the result to be achieved of each task or overall system.

**H:**

High priority: Key features not working.They have high business and functionality impacts. The repair happens on an urgent basis before low priority.

**I:**

Included Cases: In UML modeling, an include relationship is a relationship in which one use case (the base use case) includes the functionality of another use case (the inclusion use case). The include relationship supports the reuse of functionality in a use-case model.

**L:**

Low priority: Rarely used features not working. They have low functionality and business impact.The repair is not urgent and will happen after high priority.

**M:**

Main Flow: Main Flow, or Main Path, is the typical scenario that leads to successful completion of the Actor's goal.

**O:**

Open standard: An open standard is a standard that is publicly available and has various rights to use associated with it and may also have various properties of how it was designed.

Open source: It denotes software for which the original source code is made freely available and may be redistributed and modified.

**P:**

Product: Software Products are nothing but software systems delivered to the customer with the documentation that describes how to install and use the system. Software products are produced with the help of the software process.

Priority: priority determines the defect urgency of repair. How soon the condition needs to be fixed.

Preconditions: A condition that must be fulfilled before other things can happen or be done.

Primary Actors: Primary actors are people, or at times even other systems, that require the assistance of the system under consideration to achieve their goal. They initiate the use cases of the system (business processes or application functionality).

**Q:**

Quality attributes: Within systems engineering, quality attributes are realized non-functional requirements used to evaluate the performance of a system.

**R:**

Related Requirements: The requirements that are compulsory before a particular task initiates ; the necessary condition.

**S:**

System's functionality: In software engineering and systems engineering, a functional requirement defines a function of a system or its component, where a function is described as a specification of behavior between inputs and outputs.

System limitations: A technical limitation of a software usually refers to what the defined system is unable to do as of its present state.The technical limitation of software usually serves as recommendations for improvements on upcoming systems. This computing article is a stub.

System performance: The amount of useful work accomplished by a software system.

System attributes: System attributes are the fundamental elements that make a particular system what it is. The attributes are used to classify systems in the taxonomy of system types.

Scope: The extent of the area or subject matter that something deals with or to which it is relevant.

Successful End Conditions: The conditions whose occurrence shows that the task in hand is complete.

Secondary Actors: A secondary actor is the one from which the system requires the assistance to complete the use case.

Software process: The software process is a way in which we produce software.

**T:**

Trigger: A trigger generally causes a program routine to be executed.

**U:**

User interface: User interface is the front-end application view to which user interacts in order to use the software.

User: A user is a person who utilizes software.

User Classes: A user class is a set of developer-defined attributes (characteristics) and methods (behaviors) that you can use to refer to multiple data items as a single entity.

**Appendix B: Analysis Models**

*<Optionally, include any pertinent analysis models, such as data flow diagrams, class diagrams, state-transition diagrams, or entity-relationship diagrams*.>

**Appendix C: To Be Determined List**

1. A set of four leaderboards, each for specific group of players that will update every month:

* Friends leaderboard: It will show the overall standing of the player amongst their friends.
* Global Group leaderboard: Players can make a group of around 10 people who can play to rank higher globally and earn rewards.
* Global Individual leaderboard: It will show the overall standing of a player amongst all the players who have played this game across the globe during the month.
* Country Leaderboard: It will show the overall standing of a player amongst all the players who have played this game across the country during the month.

1. Providing the guidelines of professional chess and checkers players.
2. Upgrading the dimension of chess pieces from 2D to 3D.
3. The user can buy a special avatar using the earned in-game currency.
4. The User can buy in-game currency, chess boards, chess pieces and more for real money.