

## Introduction

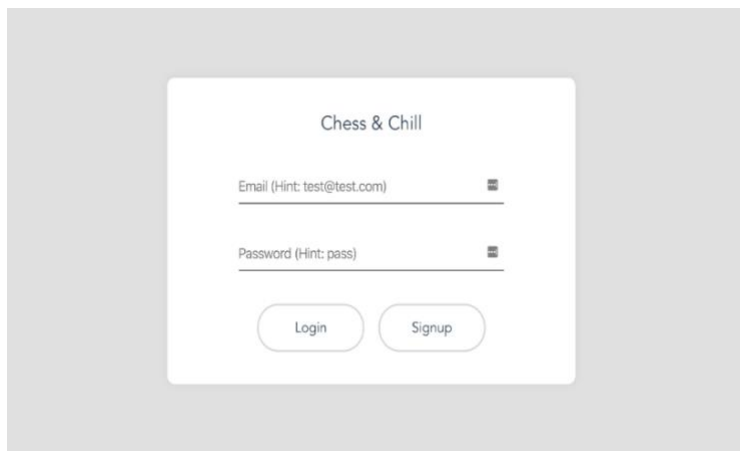
The application that we designed and implemented is a web-based version of the classic game of chess. We have created it so that it can be played on both desktop and mobile devices. The game will be played between two players and will follow the rules of chess. The game of chess is played on an 8x8 board, with 16 pieces per player. The goal of this project is to connect chess players from around the world by providing them with a platform to play the game they enjoy as well as expanding the chess community.

Our application is tailored to beginner and experienced chess players where they can play single games or join a tournament. Players can use single games to learn the game of chess and can be used to improve their skills. The tournament feature allows for a more competitive feel to the game of chess and allows a group of people to play. An example of a group that could use the application could be a chess club to help improve problem solving skills.

There are two types of users in our application User and Admin. New users to our application will have to create a user account by using the signup page and can use the login page to sign in. After signing in, players are greeted with the main menu where they can start a game of chess or join a tournament. Tournaments of any size can be created and managed by Admins on the Tournaments page.

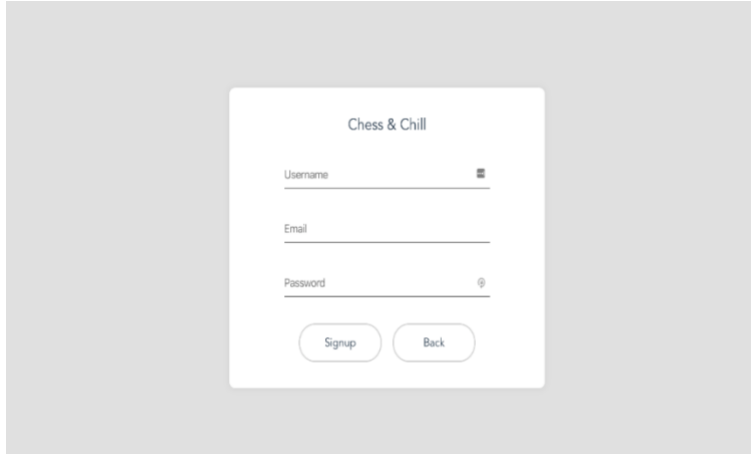
## User manual

### Login & Signup

The image shows a web form titled "Chess & Chill" centered on a light gray background. The form has a white background and rounded corners. It contains two input fields: "Email (Hint: test@test.com)" and "Password (Hint: pass)". Each field has a small eye icon to its right for toggling visibility. Below the fields are two rounded buttons: "Login" and "Signup".

#### **Login:**

The user will begin at the login screen from which he can either login if he has an existing account or navigate to the signup page to create one. If the user chooses to login they will be taken to the main menu.



Chess & Chill

Username

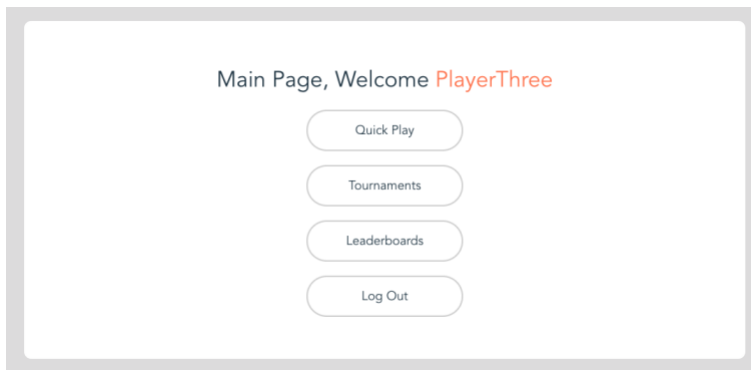
Email

Password

### Signup:

If the user, however, chooses to create a new account on the signup page, he must ensure the username is not taken and that all the fields are filled out, as the form messages will let them know otherwise.

### Main Menu



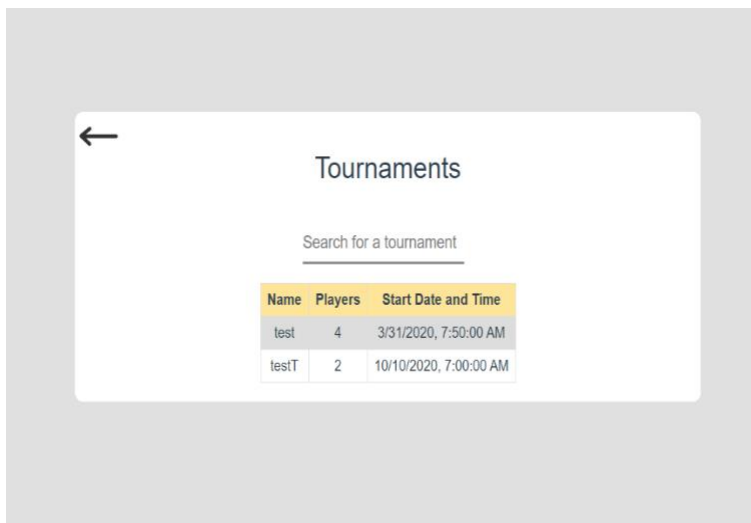
Main Page, Welcome **PlayerThree**

After logging in or signing up, the user will be taken to the main menu page.

On this page, the user can navigate to the Quick Play page, Tournaments page, or Leaderboards page.

To log out, the user would click the 'Log Out' button and would be taken back to the Login page

### Tournaments



←

Tournaments

Search for a tournament

Name	Players	Start Date and Time
test	4	3/31/2020, 7:50:00 AM
testT	2	10/10/2020, 7:00:00 AM

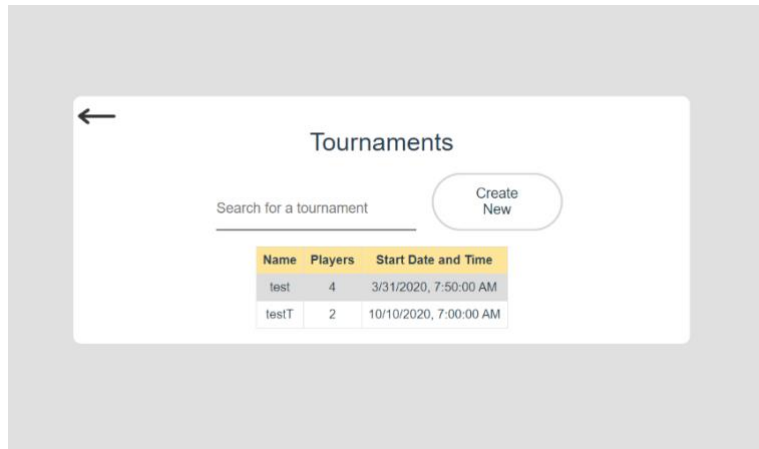
### Main Tournament Page (User view):

Once the user selects Tournaments from the main menu, they are presented with the Tournaments Page.

The user can select the back button to return to the main menu.

A user can search for a tournament by name using the search bar. The results will filter and show the result if found.

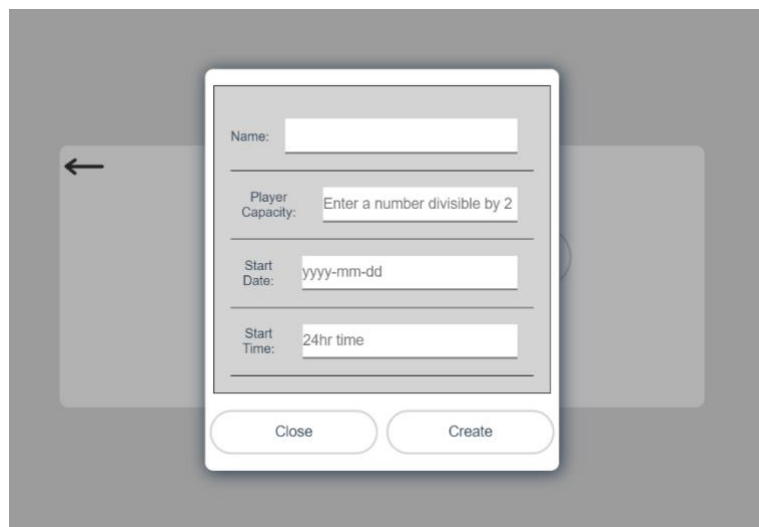
All tournaments will be shown in the table. The info includes name, max players, start date and time.



### Main Tournament Page (Admin view):

Once an Admin selects Tournaments from the main menu, they are presented with the Tournaments Page.

Admins can create new Tournaments by selecting “Create New”.



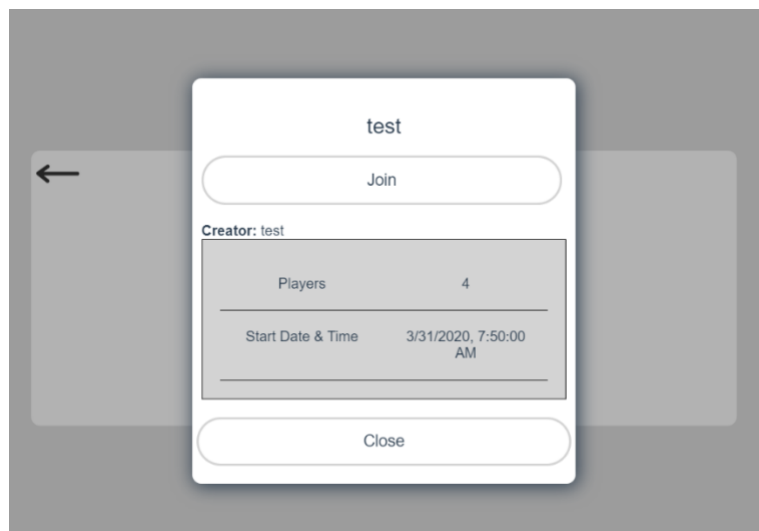
### Create Tournament:

After an Admin clicks “Create New”, a new tournament modal will appear.

All fields are required for the Tournament to be created. If invalid input is given, an error message appears.

The modal can be closed by clicking “Close”.

If all fields are valid, the Tournament will be created after clicking “Create”.



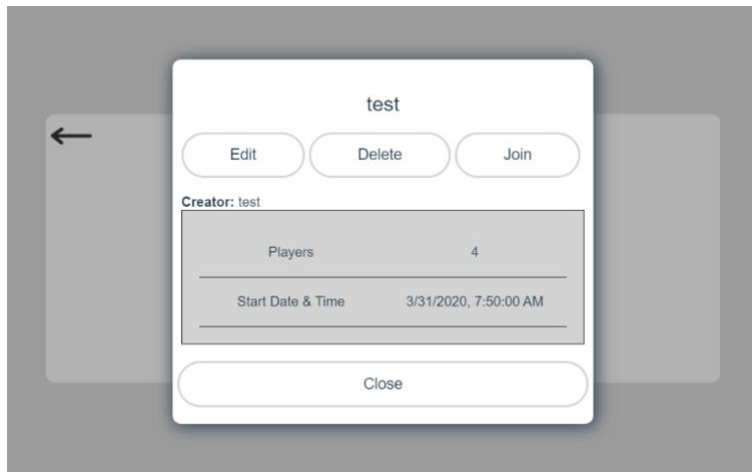
### Tournament Details (User view):

After the user clicks a row from the Tournament table, a details modal will appear.

The user can join the selected tournament by clicking “Join”.

The modal can be closed by clicking “Close”.

The tournament will start automatically once it reaches the maximum number of players.



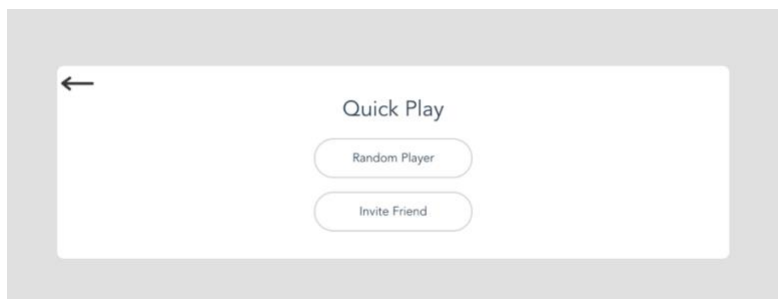
### Tournament Details (Admin view):

After an Admin clicks a row from the Tournament table, a details modal will appear.

The Admin can delete the Tournament by clicking “Delete”.

The Admin can Edit the Tournament by clicking “Edit”. but was not finished.

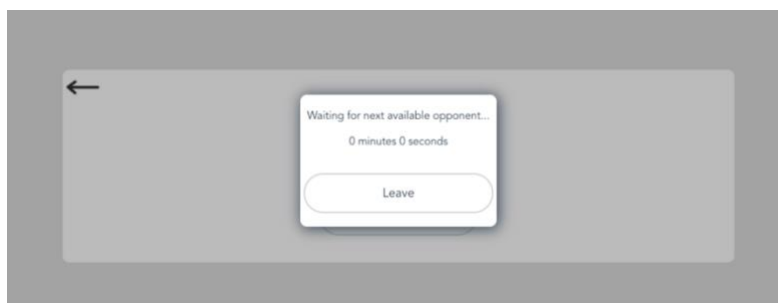
## Quick Play



After clicking the ‘Quick Play’ button from the main menu the user is taken to the Quick Play page.

There are two quick play options: Random Player or Invite Friends

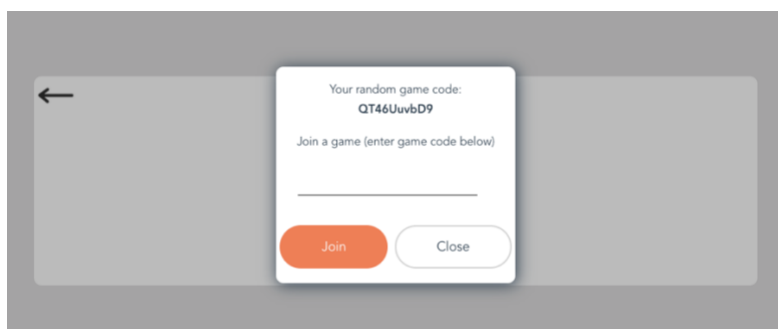
### Quick Play (Random Player):



After the user clicks the ‘Random Player’ button, a modal will appear only if there is no other user waiting an opponent to play against.

If there is already an user waiting for an opponent and another user clicks ‘Random Player’ a new chess game will immediately start between the two users.

### Quick Play (Invite Player):

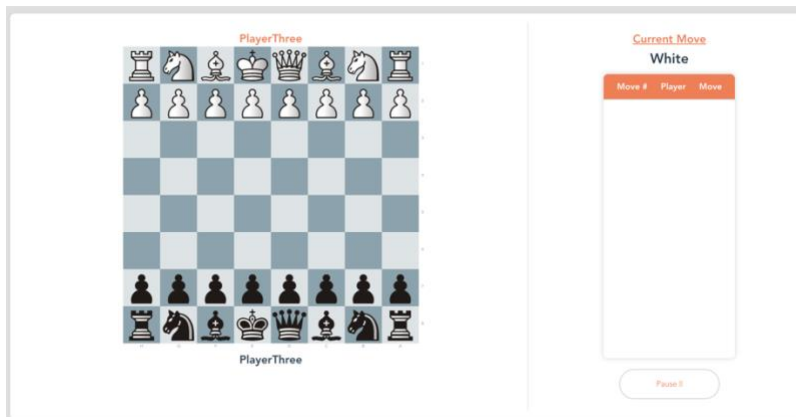


After the user clicks the ‘Invite Player’ button, a modal will appear with a random game code and an option for joining another game.

The randomly generated game code is specific to each user which they are send to another user so they can play together.

To join another game, there is an input field where a user can input the random game code from the other user. After clicking ‘Join’, both users are taken to the chess game.

## Chess Game



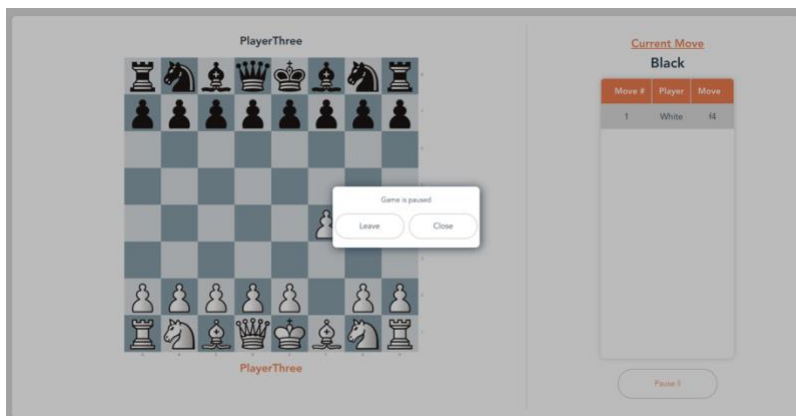
Users will be taken to this chess game page to play their game.

The chess piece colour the user is for the game will be orientated to the bottom of the chessboard.

The current colour move is displayed to indicate whose turn it currently is.

The past moves that each user made will be tracked in a list and displayed to both users.

At any time during the game, either user can click the 'Pause' button.

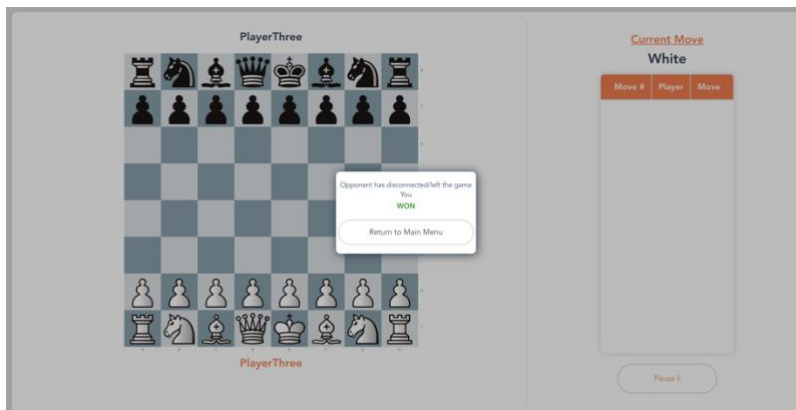


### Chess Game (Pause):

Clicking the 'Pause' button, a modal will appear for the user that clicked it and there will be two options presented to the user: Leave or Close.

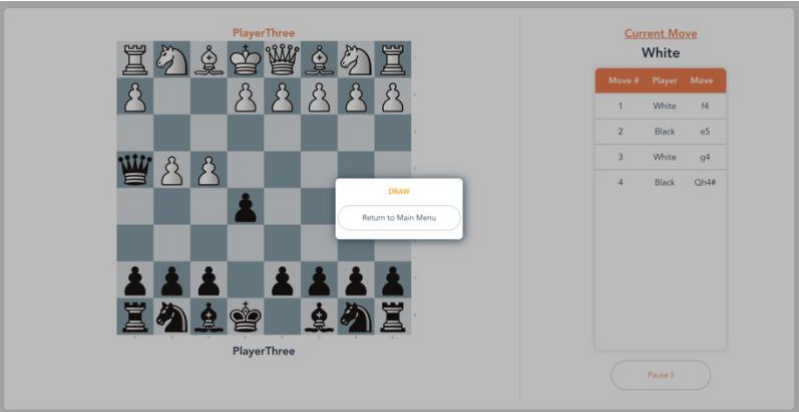
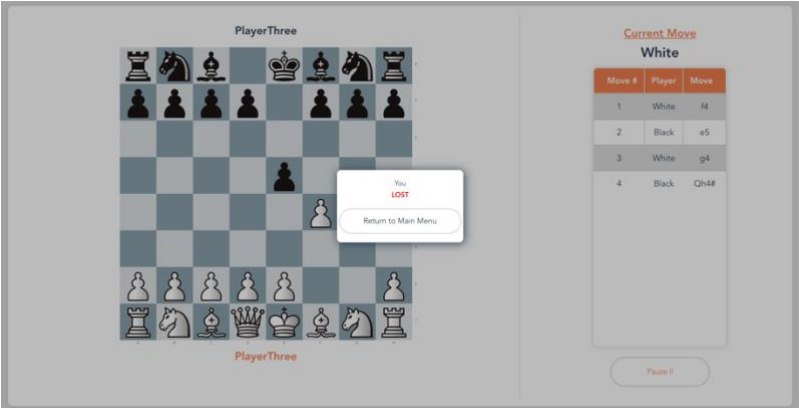
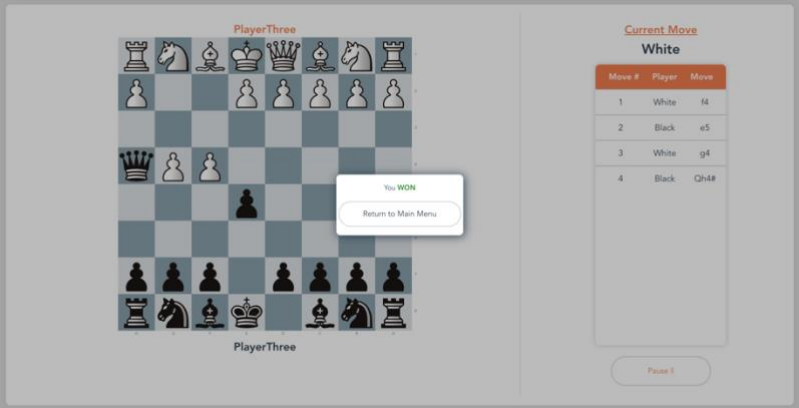
Clicking 'Leave' will result in the user leaving the current game.

Clicking 'Close' will close the pause modal and the user will return to the game.



A modal will appear for the user to indicate that an opponent has either left the current game or randomly disconnected.

The user that left/disconnected will have it considered a loss in their record and the other user would have it recorded as a win.

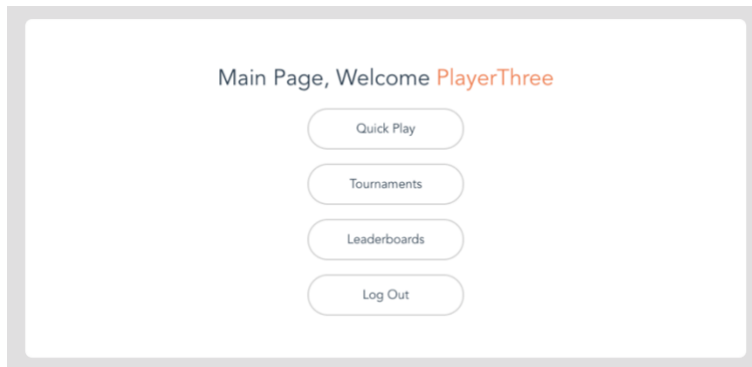


**Chess Game (End State):**

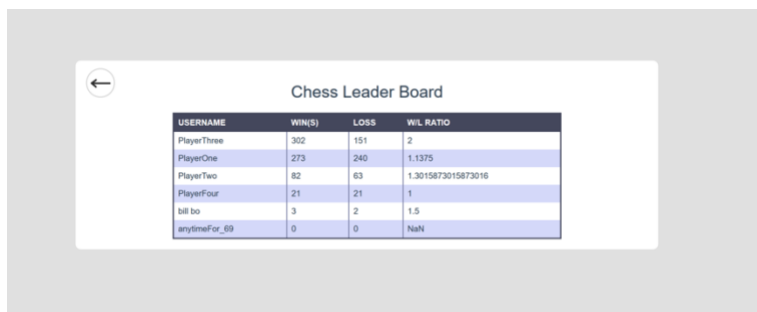
If one user checkmates another user or the game is a draw, a modal will appear indicating to the user that that they either win, lost, or the game was a draw.

To return back to the main menu, the user can click the 'Return to Main Menu' button in the modal.

## Leaderboard



Once a user has logged in, they are taken to the main menu where they can choose to view the latest updates on the leaderboard



Chess Leader Board

USERNAME	WINS	LOSS	W/L RATIO
PlayerThree	302	151	2
PlayerOne	273	240	1.1375
PlayerTwo	82	63	1.3015873015873016
PlayerFour	21	21	1
bill bo	3	2	1.5
anytimeFor_69	0	0	NaN

Leaderboard gives the ability to track the best players in the game. This allows users to showcase their progress, wins, losses and win/loss ratio.

This creates a more engaging environment for the players and gives them an incentive to keep getting a better position on the leaderboard.

## Project Requirements

Requirement	Status
Single page interface	Yes – our entire application is a single page interface.
Use of HTML, CSS and JS	Yes – used HTML, CSS and JS but used the frontend framework VueJS.
Browsers tested	Google Chrome and Mozilla Firefox.
Mobile support	Yes – users are able to use our application on a mobile device.
Use of node.js	Yes – used to install libraries and dependencies.
Support of multiple user types	Two types of users support: admins and normal users.
User authentication	Created a custom username/password system that utilizes the database we setup for user's signing up and authentication.
Persistence	Yes – a user's wins and losses are recorded in a database and they can check their record in the Leaderboard page. Additionally, their username is also stored in the database and displayed to user when they log in again.
Real-time interaction between users	Yes – when a user moves a chess piece during a game it updates the chessboard in real-time so that they are the same for both users.

## Technologies Used

Technology	How we used the technology
Vue.js	Front end framework and client side routing of pages
Mongo	Back End language
MongoDB Atlas	Cloud based database storage
Chess.js (npm) Vue-Chessboard (npm)	Chess.js was used for the chess game logic to determine if a player was in checkmate and checking if the game was a draw. (Github: <a href="https://github.com/jhlywa/chess.js">https://github.com/jhlywa/chess.js</a> )  Vue-chessboard was used for the chessboard and chess piece movement for this game application. (Github: <a href="https://github.com/vitogit/vue-chessboard">https://github.com/vitogit/vue-chessboard</a> )
Node.js and Express.js	JS runtime environment and server-side logic.

## Deployment Instructions

The application consists of 2 layers that have to be started in a certain order – The server and the client component. First the server must be launched, then the client

### 1. The server:

- In VueChess/Server run 'npm install && node index.js'
- Server runs in the background

### 2. The client:

- In VueChess/VueChess run 'npm install && npm run dev'
- Navigate to localhost:8080