Project: Check out these Checkers Team Undergrad

By Vichaka Houi, Logan Scarberry, Michael Mowad

Elevator Pitch

Have you ever been bored by the mediocrity of checkers?

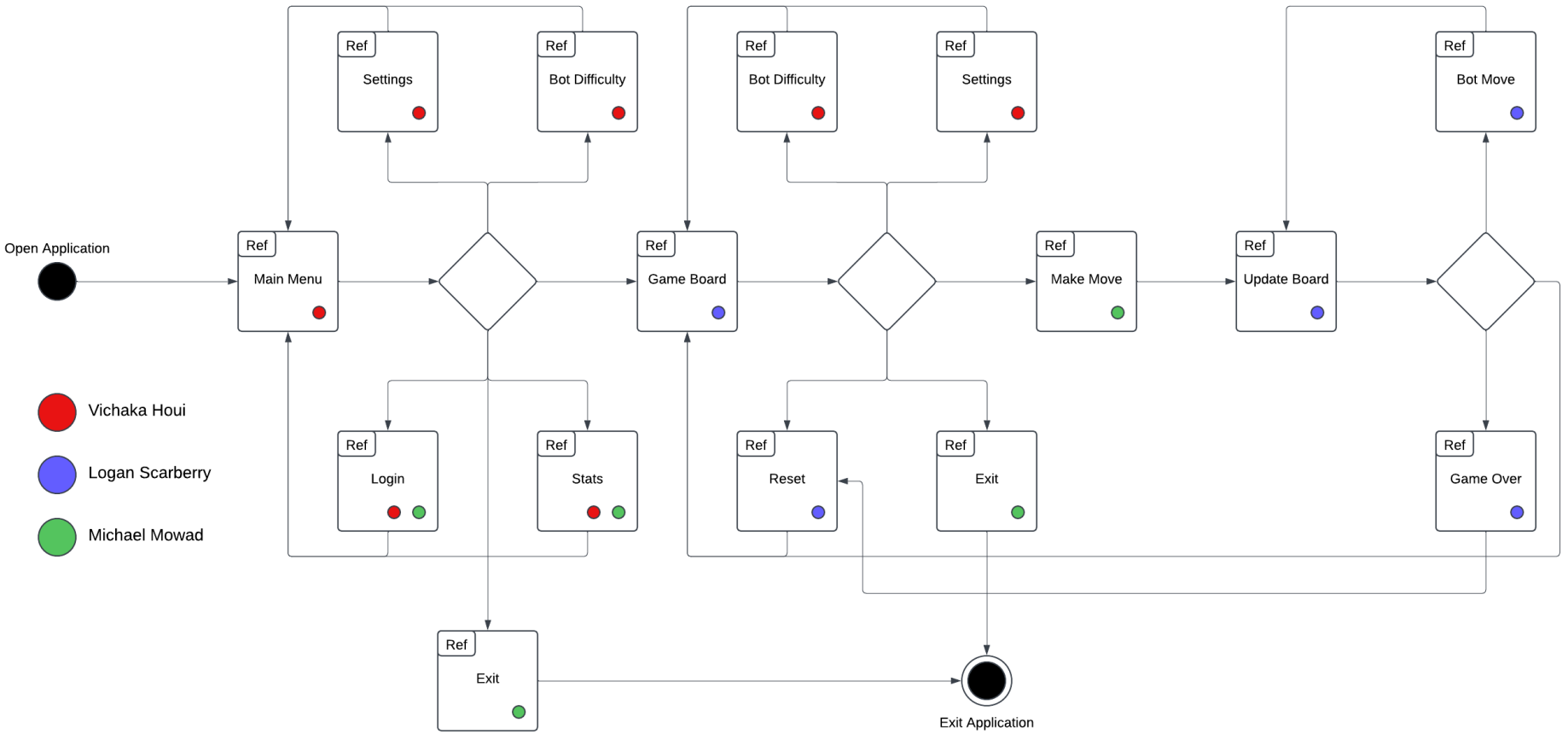
No more.

Now introducing checkers with a new revolutionary ruleset.

-BEGIN THE GAME WITH KING MOVESET-

-CHAIN JUMPING IS NO LONGER REQUIRED-

Overview


Open Application
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Main Menu
Ref
Settings
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Bot Difficulty
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Login
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Stats
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Exit
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Game Board
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Bot Difficulty
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Settings
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Reset
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Make Move
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Update Board
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Bot Move
Ref
Game Over
Exit Application
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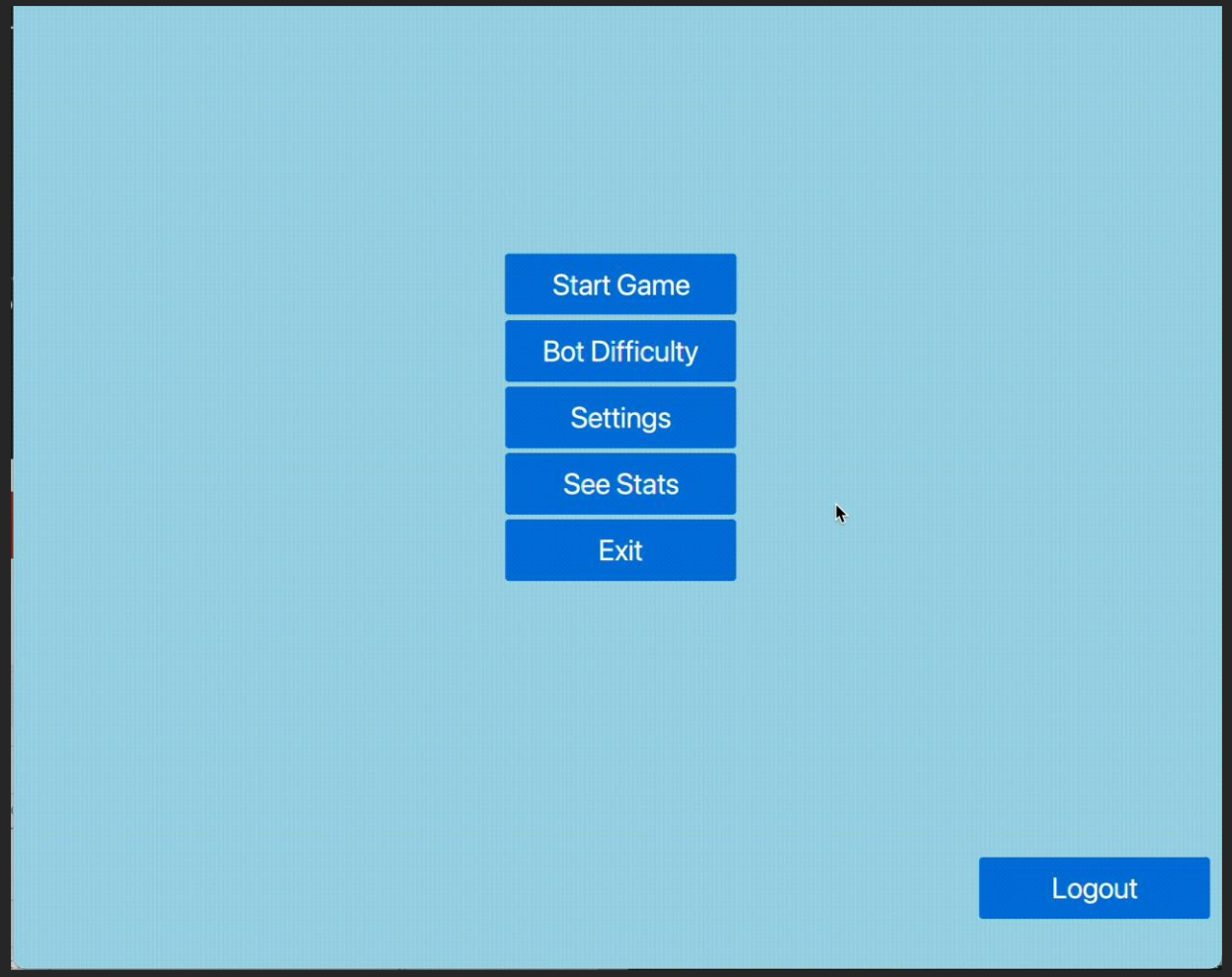
Main Menu



- Start Game
- Bot Difficulty
- Settings
- See Stats
- Exit
- Logout

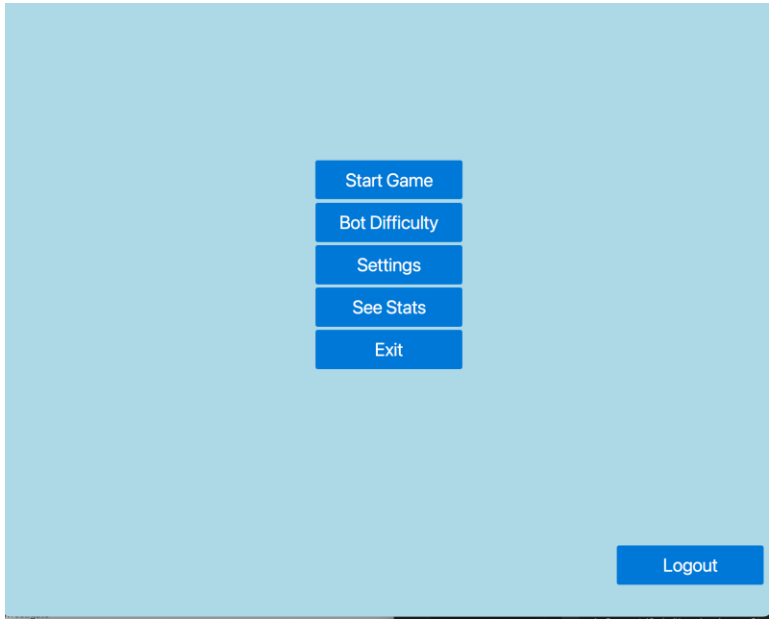
Main Menu – User Story

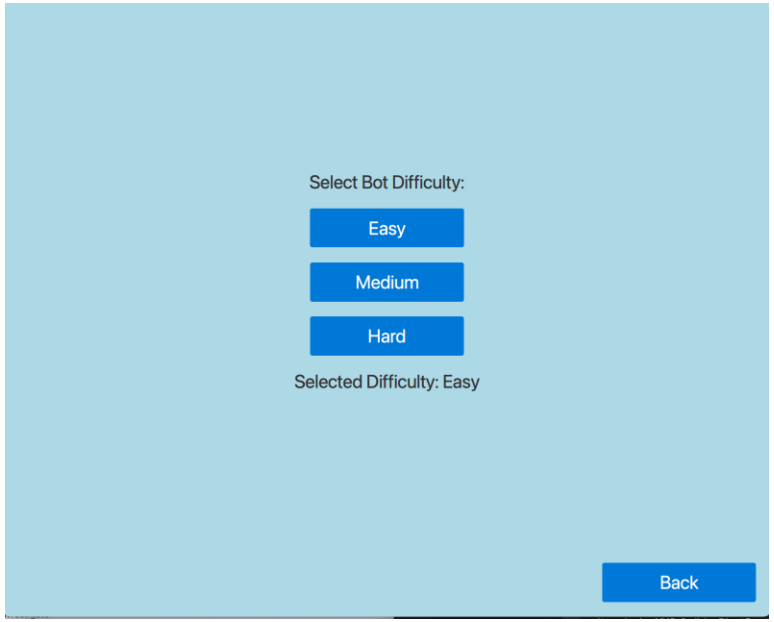
- As a user, a menu with different options is prompted and gives me multiple choices to make. I can adjust the appearance of my layout screen and how difficult my opponent can be.

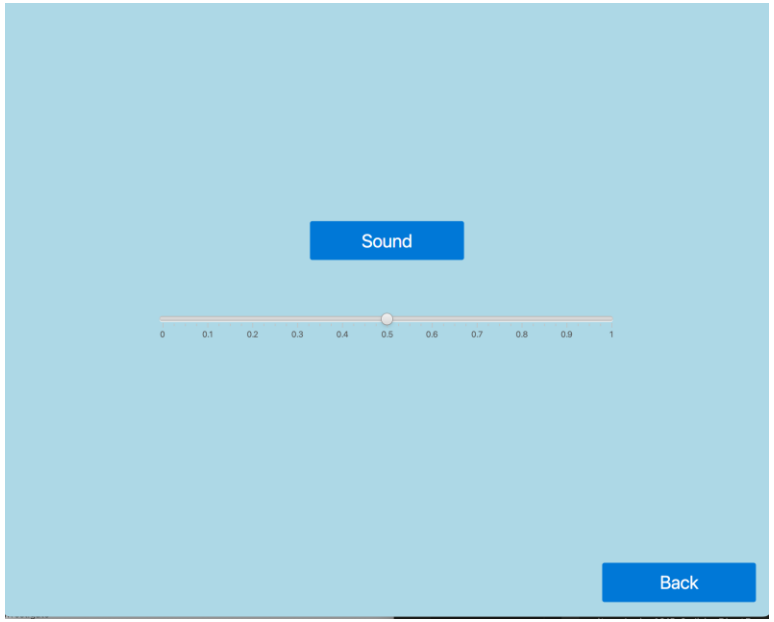
Main Menu – Requirements

- System shall have a Start Game button
- System shall have a bot difficulty button
- System shall have a game setting
- System shall have a stat button

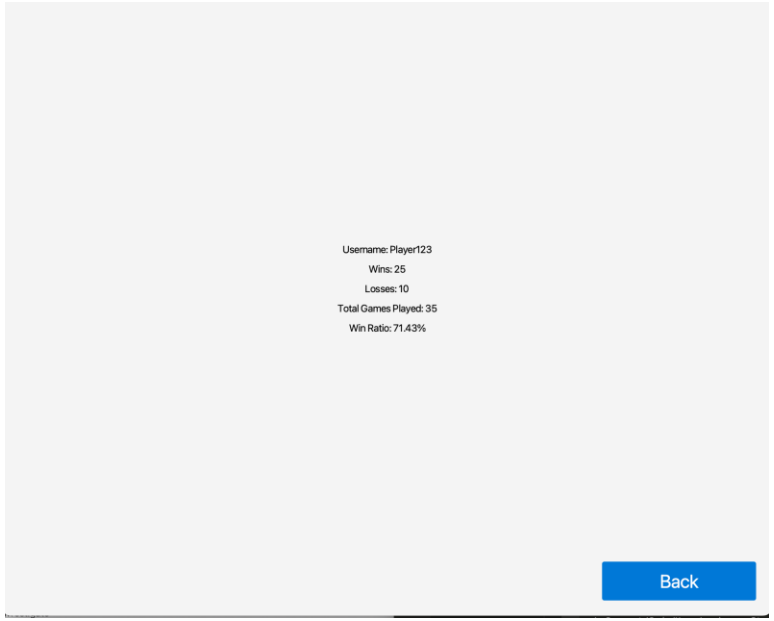
Main Menu Design

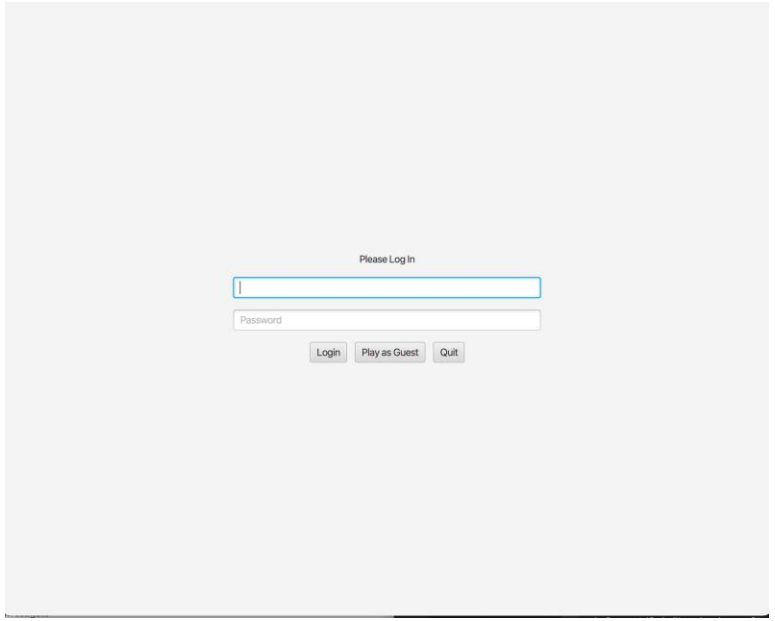






Main Menu Design part 2





Game Board – User Stories

- As a user, I would like an option to leave a Checkers game at any given stage and then resume it again at a later time.
- As a back-end developer for the Checkers GUI, I want to design a GUI that will be able to send and receive data from the game mechanics back-end so that the board reacts and functions properly with user input clicks so that the board can highlight to indicate available moves after a piece has been selected.

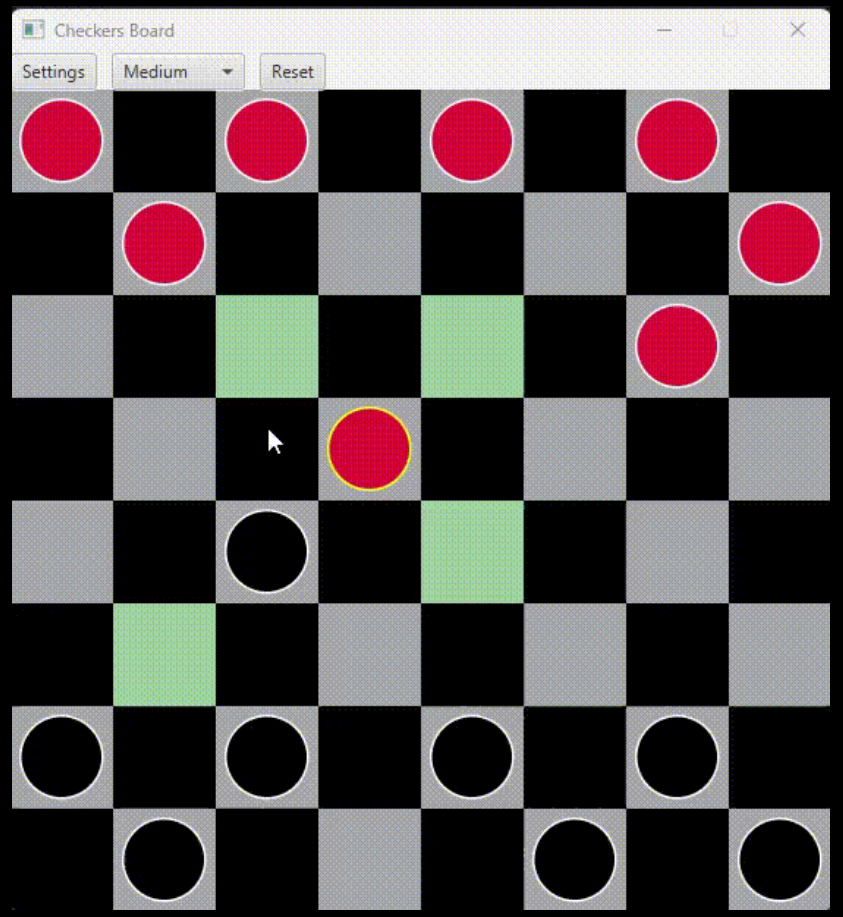
Game Board - Requirements

- The user shall be able to select a piece on the board and the board will highlight to show available moves.
- The checkerboard shall consist of 64 squares in an 8x8 layout, alternating dark and light color.

Game Board - Design

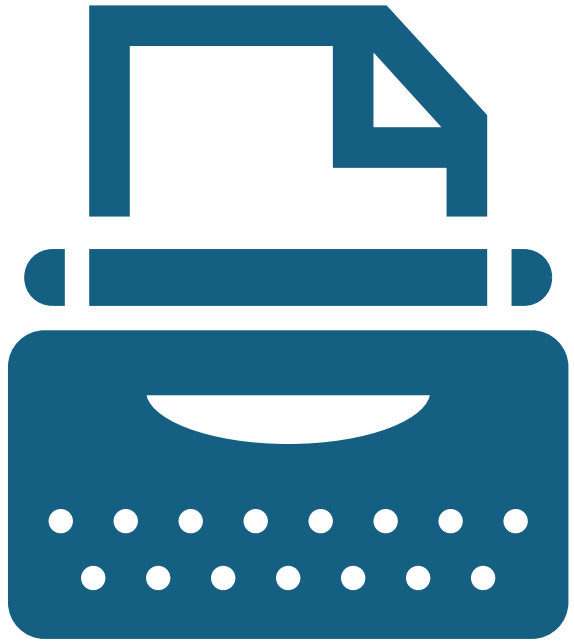
- JavaFX may be used as a framework to design the checkerboard GUI.
- The inputs made to the checkerboard by the user will be sent to the backend to determine the available moves and that information will be displayed to the GUI in the form of highlighted available moves.

Game Board - Implementation



Game Functionality – User Stories

- As a user, I would like an option to leave a Checkers game at any given stage and then resume it again later.
- As a user, I would like an option to move the pieces backwards, not just forwards.
- As a user, I would like the ability to make alternative moves instead of being forced to jump pieces when chain jumping.



Game Functionality - Requirements

The system shall allow the user to sign in using login credentials.

The system shall allow the user to save game progress to the user login.

The system shall be able to exit the game and offer the option to save progress if signed in.

The system shall allow movement of the pieces of checkers for both human players, and the bot.

The system shall allow pieces should go forward and backwards.

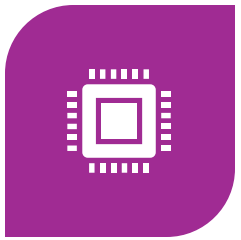
The system shall not force the execution of a chain jump

Game Functionality - Design

THE SYSTEM COMMUNICATES WITH A DATABASE THAT STORES USER INFORMATION AND ANY SAVED GAME STATE.

THE BOARD IS STORED AS A TWO-DIMENSIONAL ARRAY OF PIECES CORRESPONDING TO THE PLAYER AND BOT.

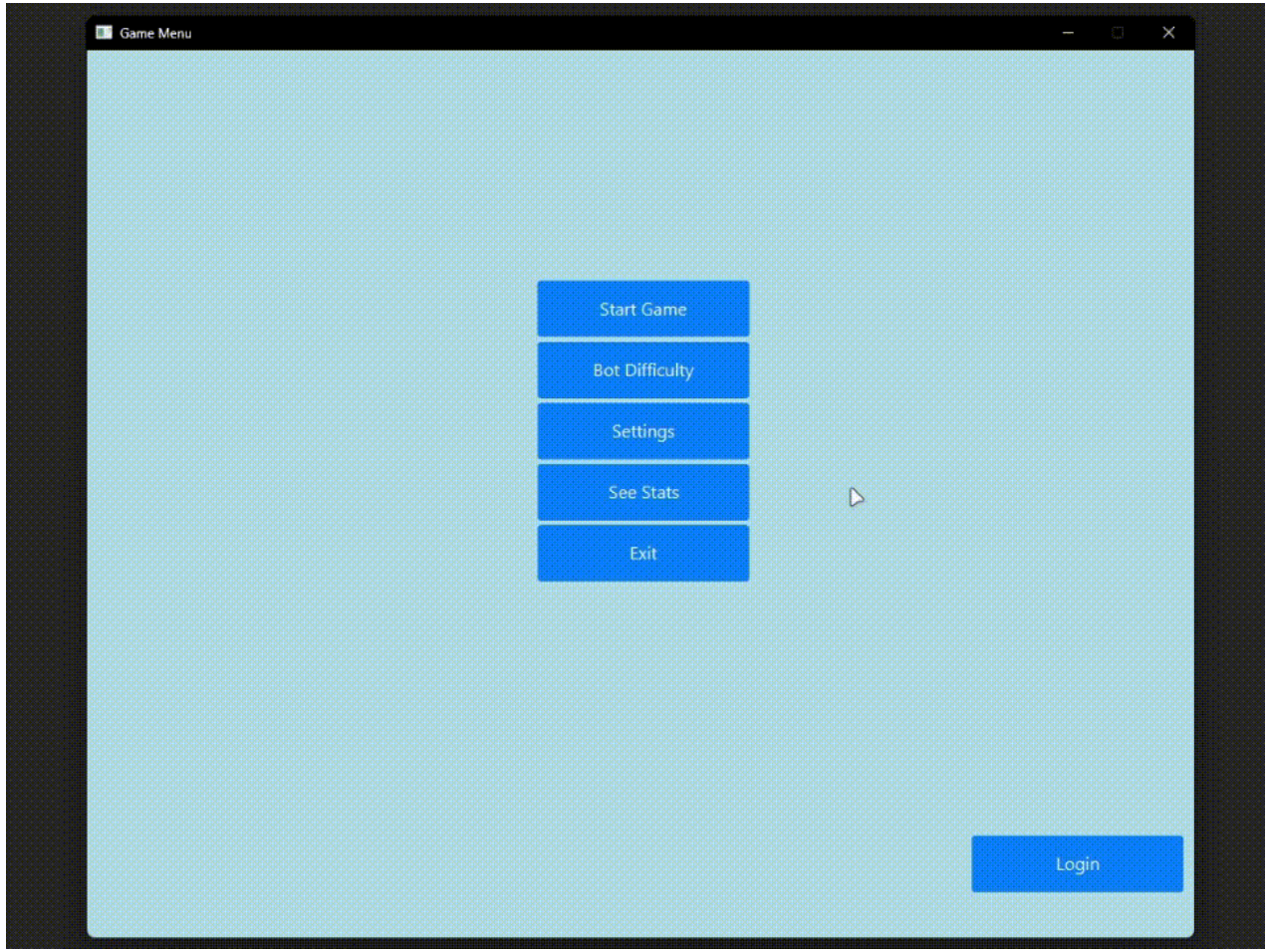
THE BOARD CAN BE EXPORTED AS A STRING TO BE SAVED



AN ALGORITHM IS USED TO DETERMINE IF A PROPOSED MOVE IS BOTH IN BOUNDS AND LEGAL.

THE ALGORITHM THEN PERFORMS AN ANALYSIS TO DETERMINE IF FURTHER MOVEMENT IS POSSIBLE BEFORE ENDING THE TURN.

Game Functionality - Implementation



Conclusion

Further Development

- Better settings integration
- Smoother animation and visual design
- More complex bot algorithm

Lesson Learned

- Group collaboration
- Time management
- Proper development documentation

Questions?