

TCP2201 Project

Trimester 2310
by <<Loco Loco>>

Group 8

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1 Compile and Run Instructions

Compilation and Run Instructions

1. Extract the zip file :

After downloading the zip file, right click on it and select the “Extract all” option, then the folder containing all the files will appear. Do the same to the zip file of java files.

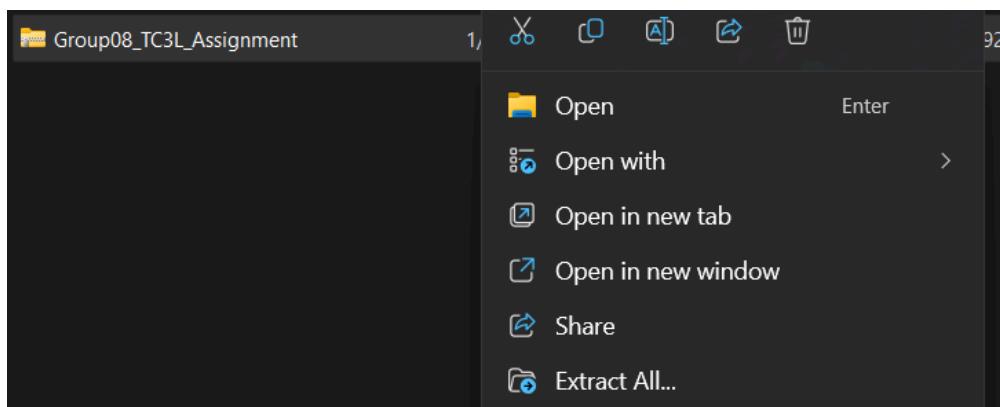


Figure 1.1.1 Extract the zip file

Name	Date modified	Type	Size
Group08_TC3L_Assignment Report.pdf	1/29/2024 7:19 PM	Chrome HTML Do...	5,949 KB
Group08_TC3L_Java Files.zip	1/29/2024 7:17 PM	Compressed (zipp...	490 KB

Figure 1.1.2 Folder

Group08_TC3L_Java Files	1/29/2024 12:22 AM	File folder
Group08_TC3L_Assignment Report.pdf	1/29/2024 7:19 PM	Chrome HTML Do...
Group08_TC3L_Java Files.zip	1/29/2024 7:17 PM	Compressed (zipp...

Figure 1.1.3 Extracted zip file with java files

Controller	1/28/2024 4:46 PM	File folder
images	1/26/2024 8:53 PM	File folder
Model	1/28/2024 4:45 PM	File folder
View	1/28/2024 4:45 PM	File folder
Main.java	1/26/2024 8:53 PM	Java Source File
		1 KB

Figure 1.1.4 java files

2. Open the folder in terminal:

Click into the folder and copy the path. Next, open the terminal / command prompt

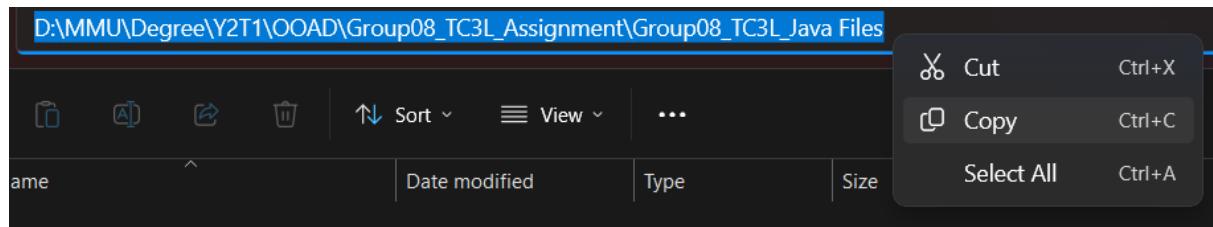


Figure 1.2.1 Copy path

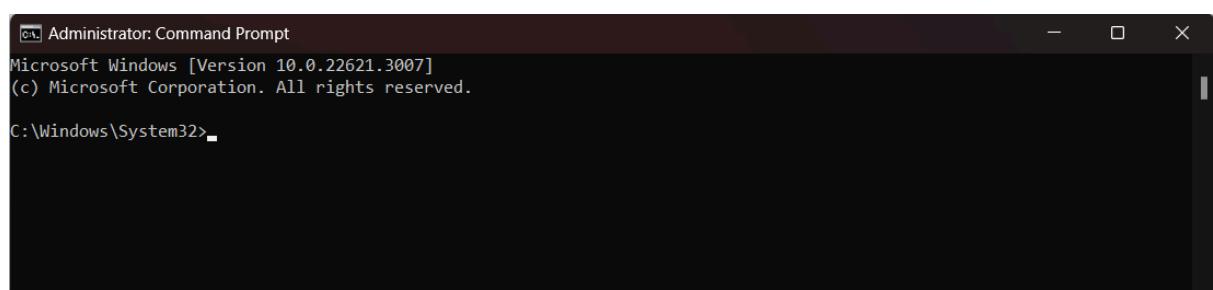


Figure 1.2.2 Terminal / Command prompt

Use the following command to change the directory. Change the drive to where your folder is located. (If needed)

Command to change the driver (**Replace D with the alphabet that matches your drive**):

```
D:
```

Command to change directory (**Replace the “path” with the actual path where your folder is located**):

```
cd path
```

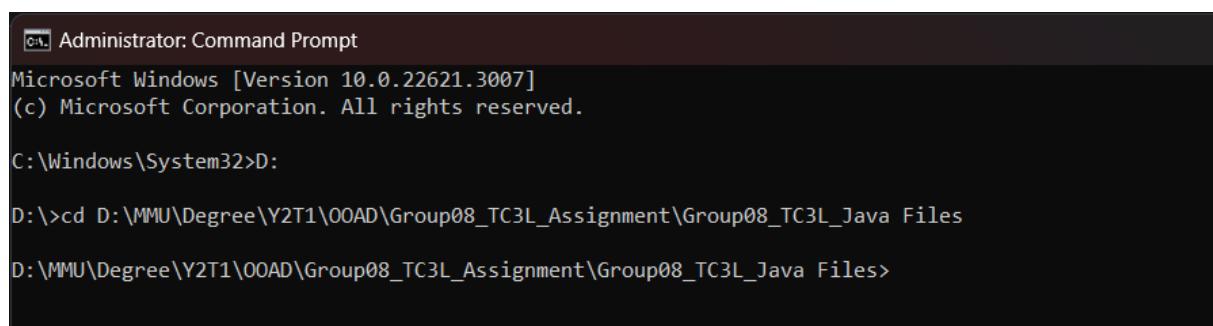


Figure 1.2.3 Change directory

3. Compile the java file :

In the terminal, type the following command to compile the java file.

```
javac Main.java
```

4. Run the java file :

In the terminal, type the following command to run the java file.

```
java Main
```

```
C:\Administrator: Command Prompt - java Main
Microsoft Windows [Version 10.0.22621.3007]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\System32>D:

D:\>cd D:\MMU\Degree\Y2T1\00AD\Group08_TC3L_Assignment\Group08_TC3L_Java_Files

D:\MMU\Degree\Y2T1\00AD\Group08_TC3L_Assignment\Group08_TC3L_Java_Files>javac Main.java

D:\MMU\Degree\Y2T1\00AD\Group08_TC3L_Assignment\Group08_TC3L_Java_Files>java Main
```

Figure 1.4.1 Run all the command



Figure 1.4.2 The application is running

2 UML Class Diagram

[Link to the UML Class Diagram](#)

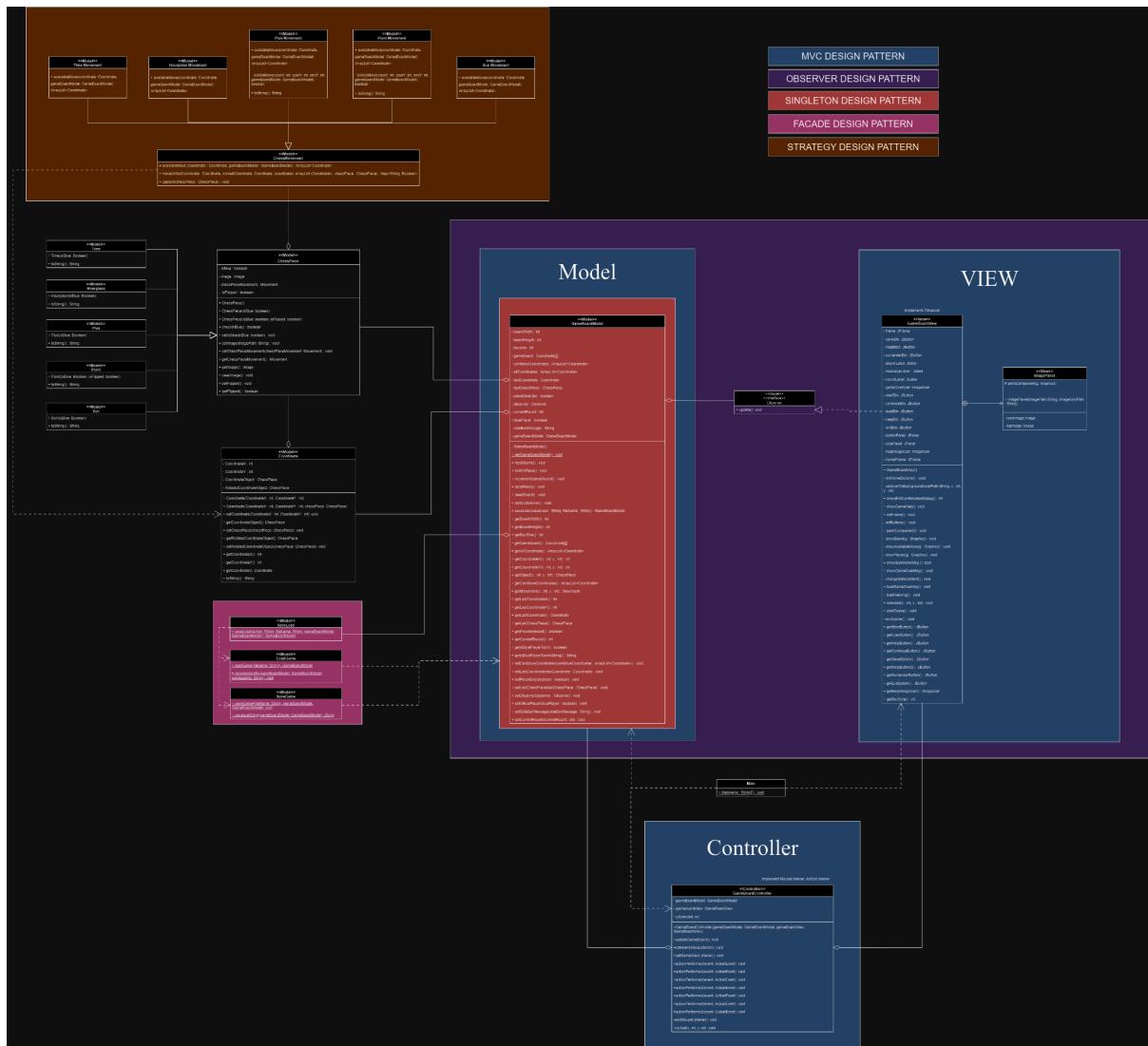


Figure 2.1 UML Class Diagram

3 Use Case Diagram

[Link To Use Case Diagram](#)

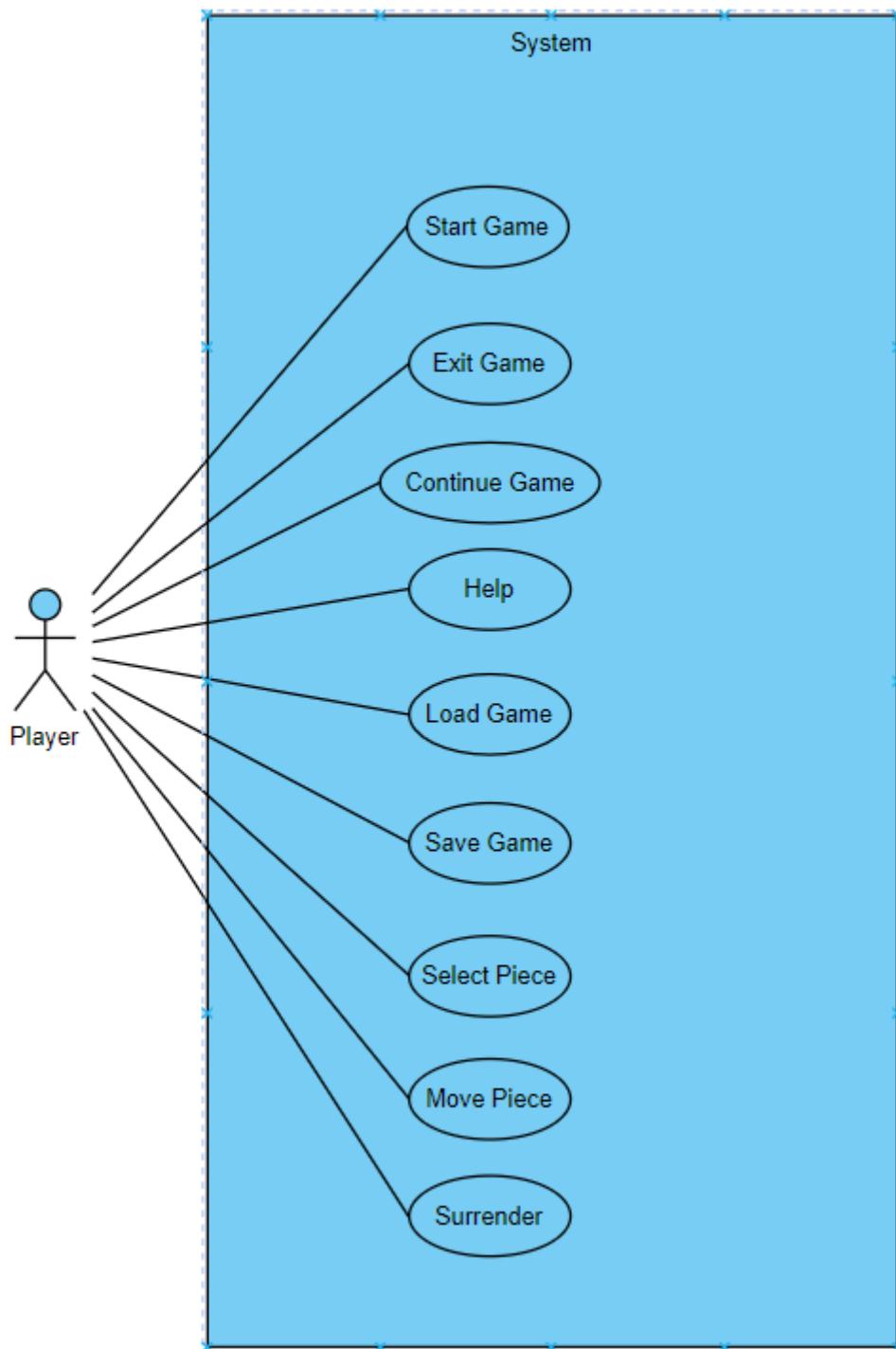


Figure 3.1 Use Case Diagram

4 Sequence Diagram

4.1 Start Game - [Link to Sequence Diagram \(Start Game\)](#)

When the "Start" button is clicked, the GameBoardView causes the GameBoardController's startBtnListener to be triggered. This causes the startGame and updateGameBoard methods to be executed, which causes the GameBoardView to update its frame and show the player the game board.

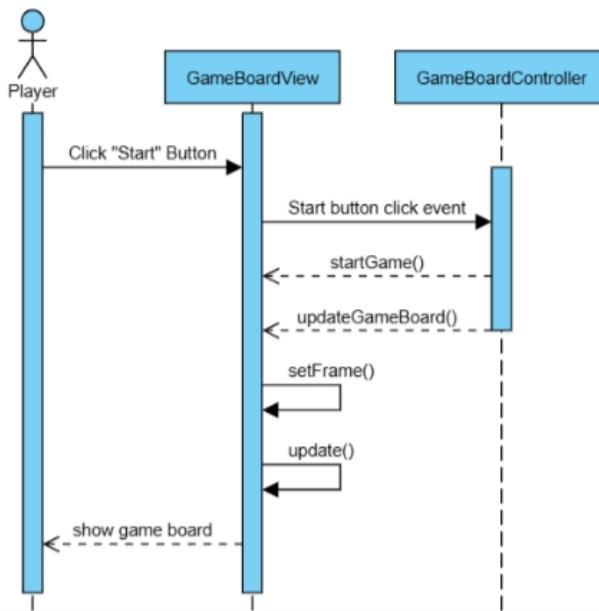


Figure 4.1.1 Start Game Sequence Diagram

4.2 Exit Game - [Link to Sequence Diagram \(Exit Game\)](#)

The GameBoardView initiates an exit confirmation dialogue via the GameBoardController when the "Exit" button is clicked. This prompts a JOptionPane dialogue where the player can select whether to exit the application ("yes") or go back to the menu page ("no").

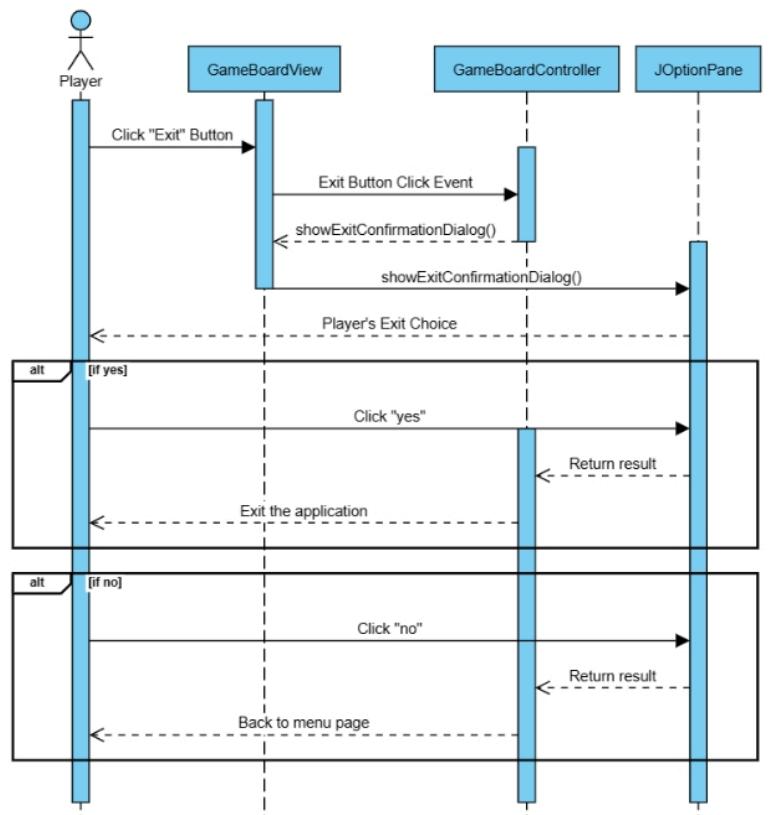


Figure 4.2.1 Exit Game Sequence Diagram

4.3 Continue Game - [Link to Sequence Diagram \(Continue Game\)](#)

The sequence diagram below shows the process of continuing the game. When the player presses on the "Continue" button, it will trigger the clicked event, which will call the startGame(method) in view, and the view will show the previous game board to the player.

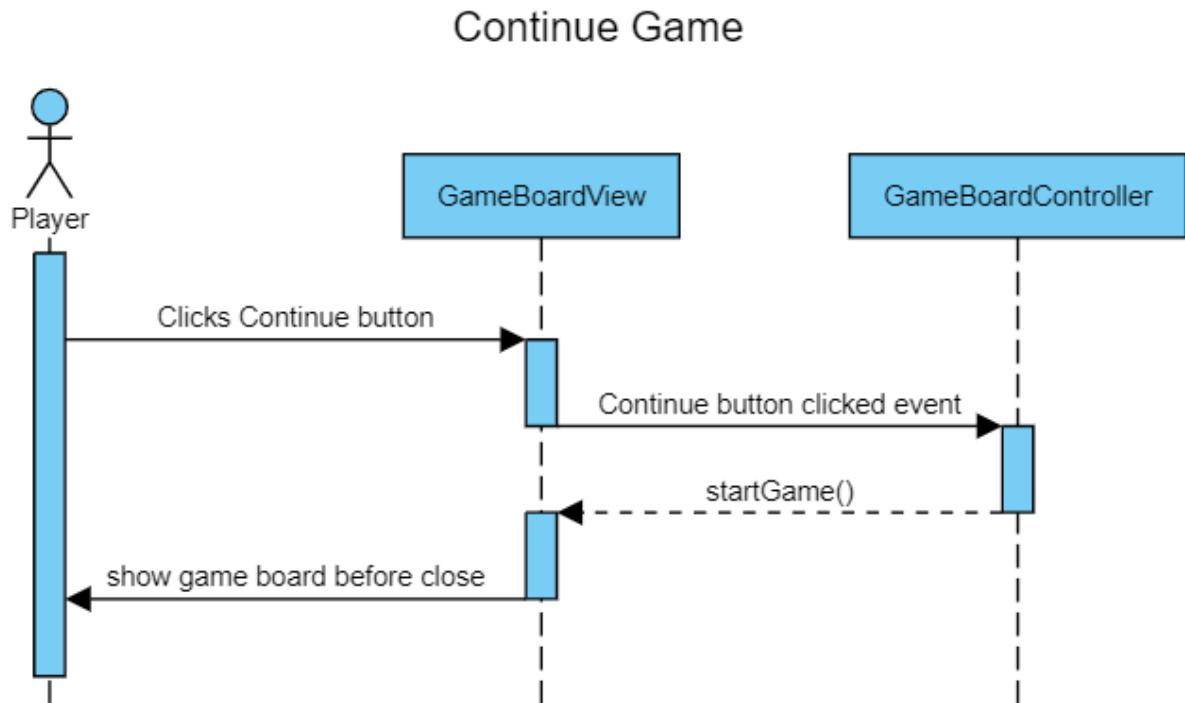


Figure 4.3.1 Continue Game Sequence Diagram

4.4 Help - [Link to Sequence Diagram \(Help\)](#)

When the player presses the "Help" button, the GameBoardView and GameBoardController are activated. The GameBoardView then asks the GameBoardController for assistance, which causes the help graphic to load and player interaction to occur.

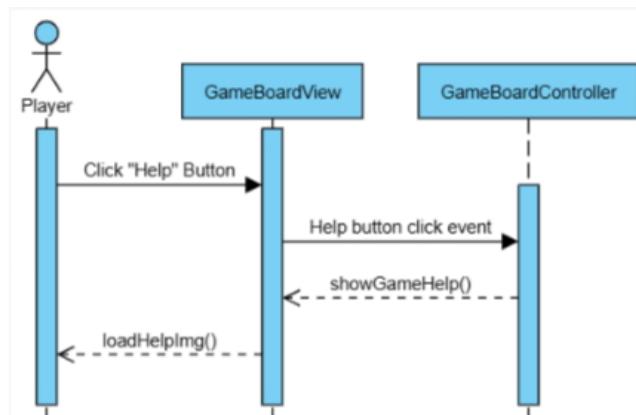


Figure 4.4.1 Help Sequence Diagram

4.5 Load Game - [Link to Sequence Diagram \(Load Game\)](#)

The following sequence diagram shows the process of loading the game when the player clicks the “Load” button at the home frame. On click, it will trigger the clicked event declared in the controller and request the saved file from the player through JFileChooser. After the player has selected the desired saved file, the JFileChooser will return the saved file to the controller and the controller will call the saveLoad method in the SaveLoad class to access the loadGame method. Next, the loadGame method will read the data from the saved file and update the data in the model. Finally, the model will notify the observer (which is view) to update (repaint) and show the loaded game board to the player.

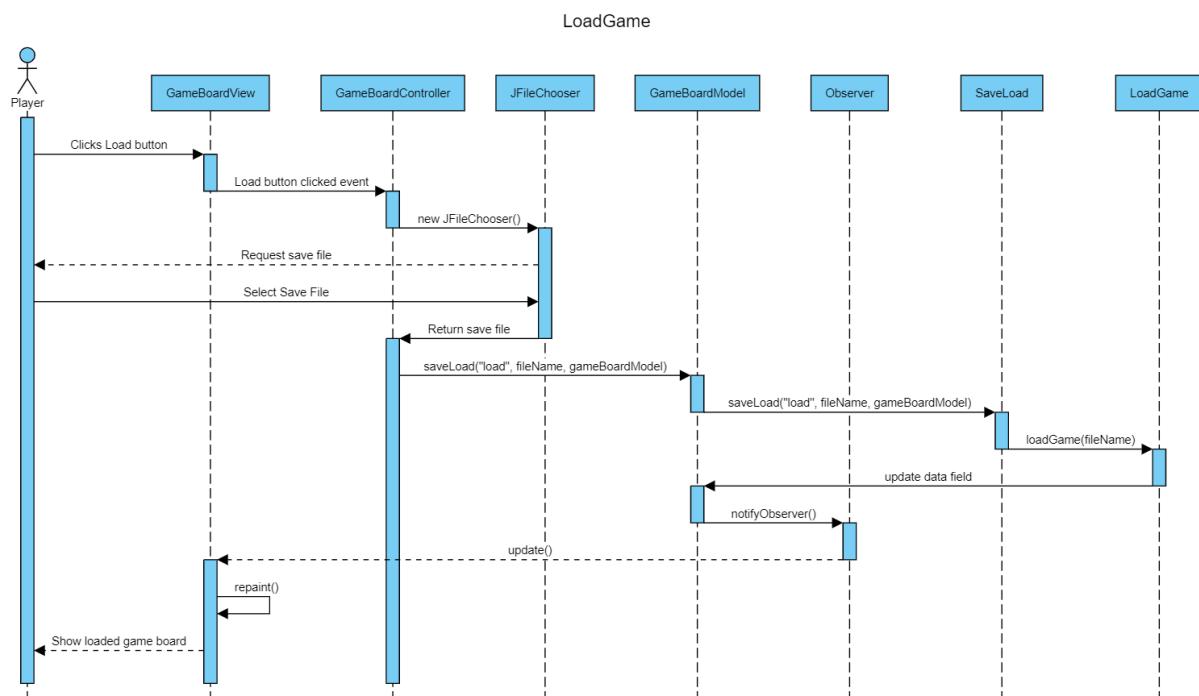


Figure 4.5.1 Load Game Sequence Diagram

4.6 Save Game - [Link to Sequence Diagram \(Save Game\)](#)

The following sequence diagram outlines the process of saving the current game state when the player clicks on the “Save” button. This will trigger the controller (GameBoardController), which then tells the model (GameBoardModel) to perform the save operation. Next, the model passes this to SaveLoad, which in this case, handles saving (saveGame). After the player has entered a file name, it then writes the game state to the text file.

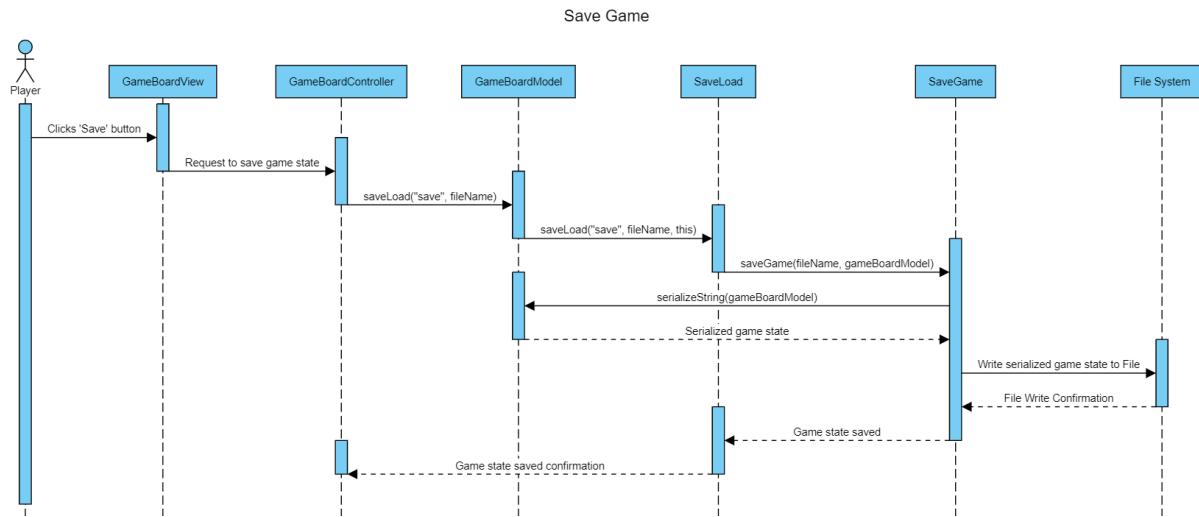


Figure 4.6.1 Save Game Sequence Diagram

4.7 Select/Deselect Chess piece - [Link to Sequence Diagram \(Select /Deselect piece\)](#)

Player selects a chess piece by clicking on a chess piece. This activates the mouseClicked(MouseEvent e) in the controller. It validates whether the piece clicked belongs to the player’s piece. If the piece is the current player’s piece, it increases the number of clicks, isSelected++. It then validates whether the chess piece clicked is the same as the last chess piece. If different, the number of clicks isSelected is 1. If the current click contains a chess piece and num of clicks, isSelected not equal 2, the controller calls setSideBarMessage in GameBoardModel. GameBoardModel then notifies Observer, which calls update() in GameBoardView to repaint() the board. Then, it displays the player’s selected chess piece message so that the player is informed about the chess piece that is selected. It then setLastCoordinate(), which represents the source of the chess piece before moving to its destination. Based on the selected chess piece, it gets the chess piece movement and the chess piece’s available moves. The GameBoardModel proceeds to notify Observer, which again calls update() in GameBoardView to repaint() the board. The board then displays the paths that the chess piece can move.

Alternatively, if the player clicks the same chess piece twice, it does not display the sidebar message, it sets setPieceSelected() to false to deselect the piece.

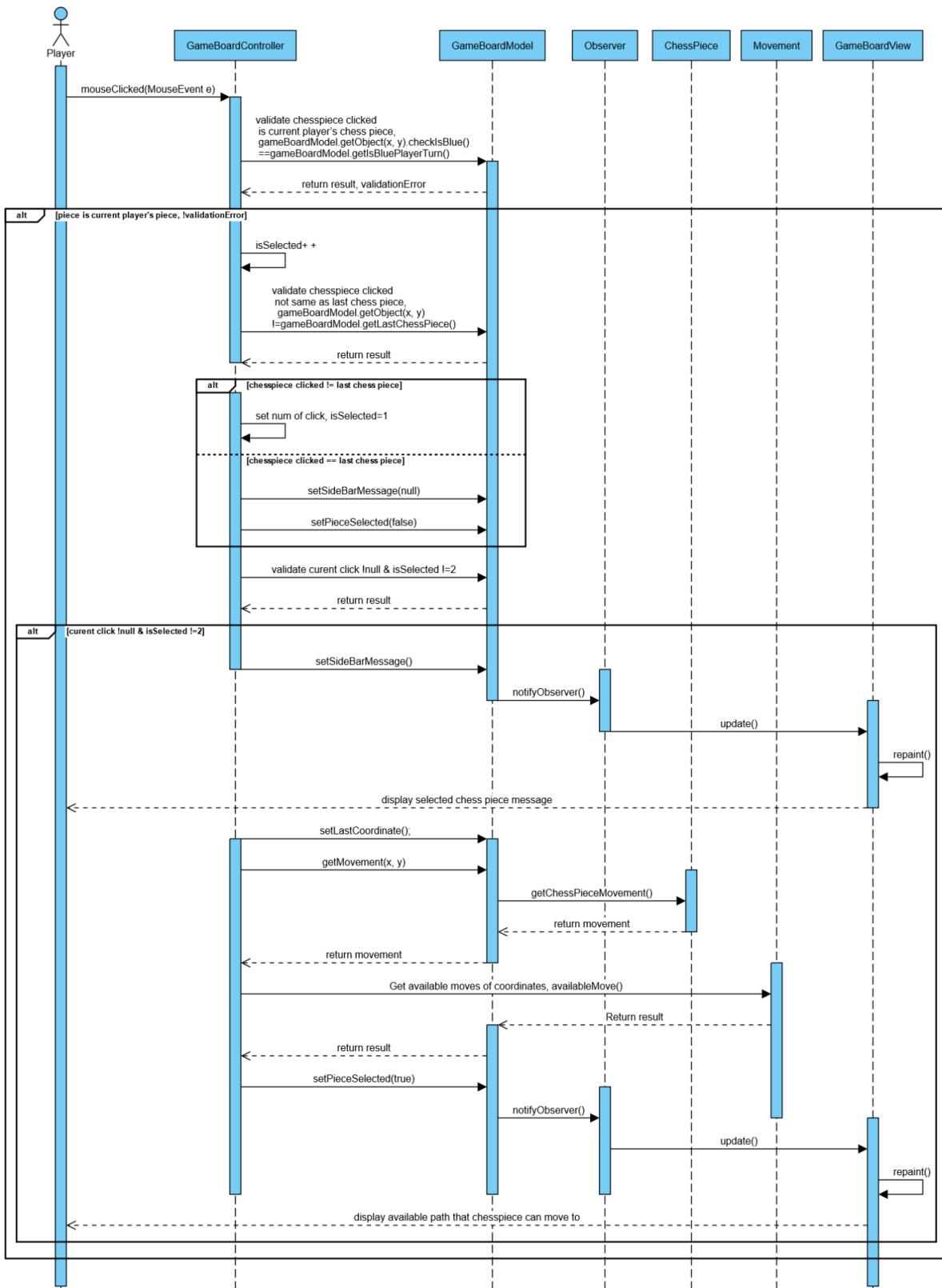


Figure 4.7.1 Select/Deselect Sequence Diagram

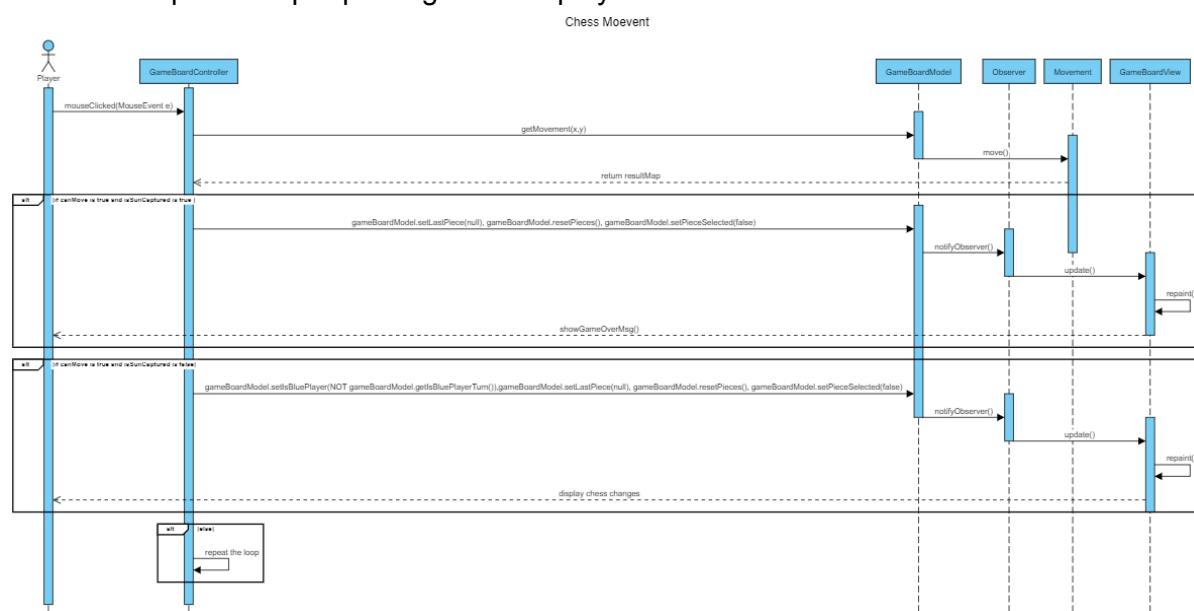
4.8 Move/Capture Chess Piece - [Link to Sequence Diagram \(Move/Capture Chess Piece\)](#)

When the player clicks on the available move, it activates the mouseClicked(MouseEvent e) in the controller, then it will getMovement(x,y) which contains the chess movement logic and executes the move() function. The move() function then returns a resultMap to indicate different situations.

If the chess can move and Sun is not captured, it is a normal move which gameBoardModel.setIsBluePlayer(NOT gameBoardModel.getIsBluePlayerTurn()), gameBoardModel.setLastPiece(null), gameBoardModel.resetPieces(), gameBoardModel.setPieceSelected(false), and it will turn to the next player to move. It will notifyObserver() and update the GameBoardView. The GameBoardView will repaint() and display the changes on screen.

If the chess can move and Sun is captured, the player wins the match, which gameBoardModel.setLastPiece(null), gameBoardModel.resetPieces(), gameBoardModel.setPieceSelected(false), and it will not turn to the next player. It will notifyObserver() and update the GameBoardView. The game board will display the showGameOverMSG().

Else: The loop will keep repeating until the player makes a valid move.



4.9 Surrender - [Link to Sequence Diagram \(Surrender\)](#)

When the player clicks the "Surrender" button, the GameBoardView triggers a surrender confirmation message through the GameBoardController, leading to a JOptionPane dialog. This prompts the player to choose whether to quit the game and go back to the menu page ("yes") or to keep playing on the game board ("no").

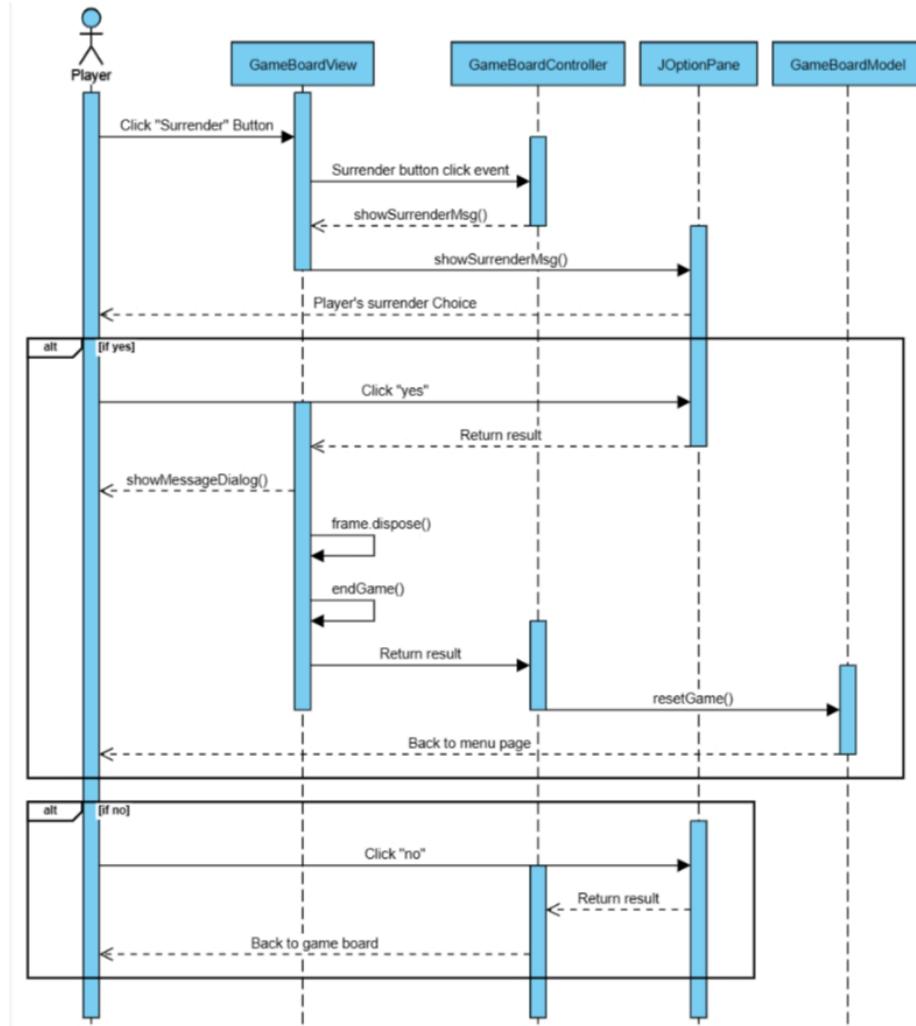


Figure 4.9.1 Surrender Sequence Diagram

5 User Documentation

5.1 Start Game:

The game board will display after the player clicks the “Start” button on the menu page.



Figure 5.1.1 - Menu page

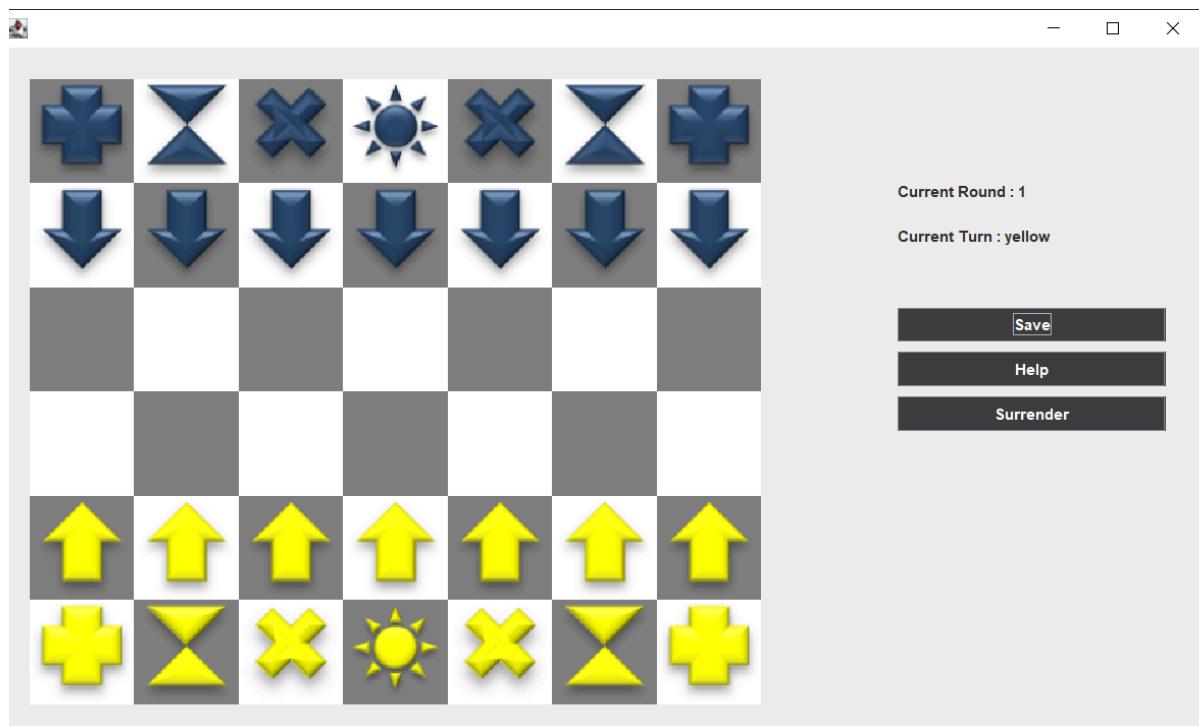


Figure 5.1.2 - Game Board

5.2 Exit Game:

When the player clicks on the “Exit” button, the system will display a confirmation message. If the player clicks on “yes”, it will exit the application and it will return to the menu page if the player clicks on “no”.



Figure 5.2.1 - Exit game confirmation dialog

5.3 Continue Game:

When the player clicks to close the game board, the system will return back to the menu page and the “Start” button will convert to “Continue”. If the player selects continue, the system will go back to the previous game board.

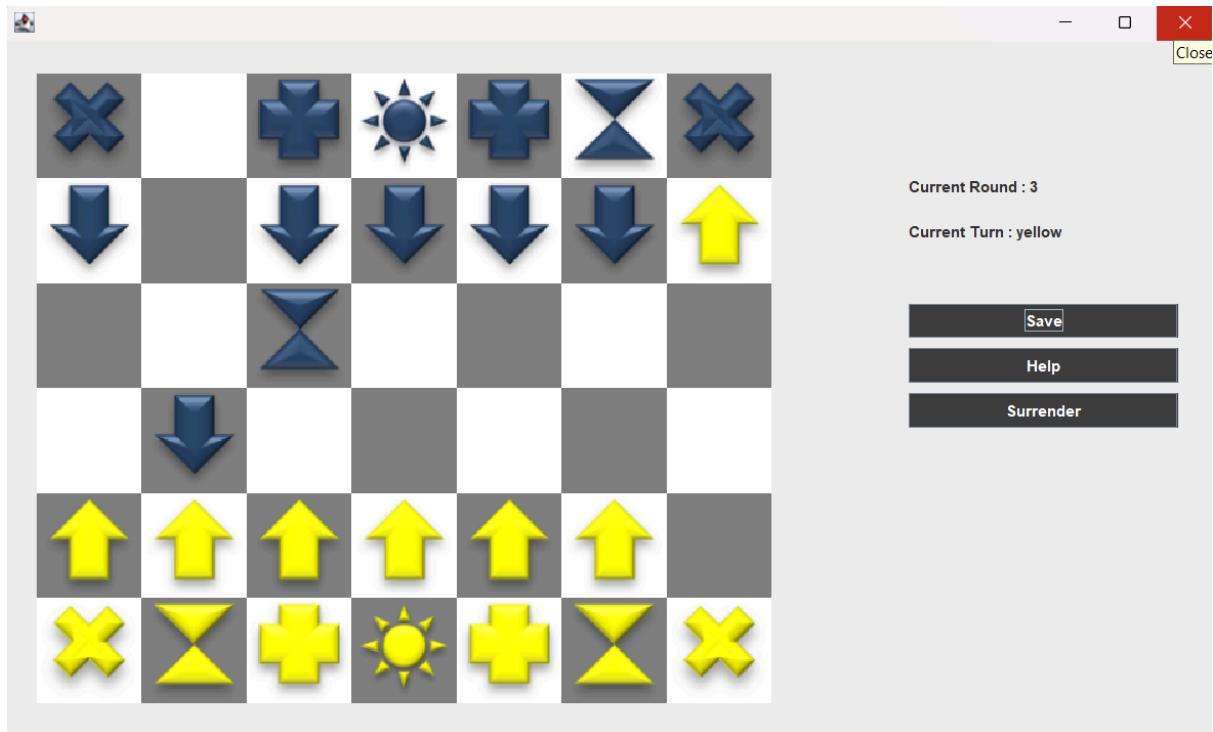


Figure 5.3.1 - Close the game board page



Figure 5.3.2 - Start button converted to Continue

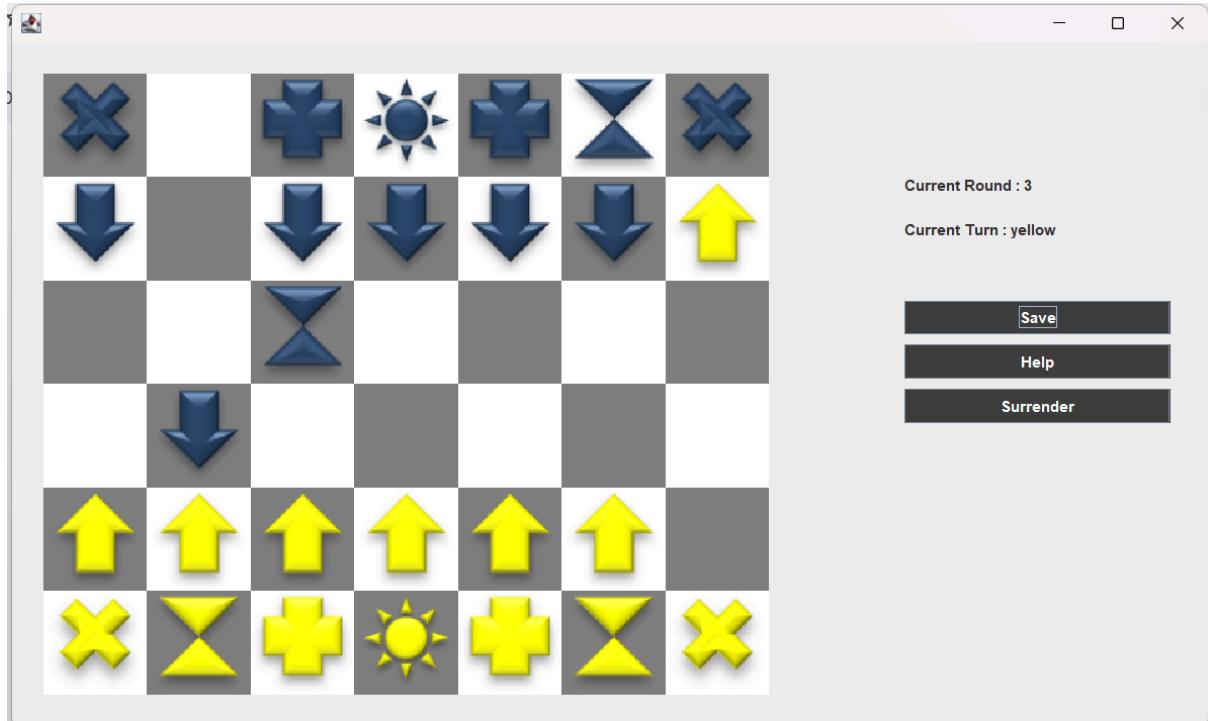


Figure 5.3.3 - Return back to the previous game board after clicks on the “Continue” button

5.4 Help:

Once the player clicks on the “Help” button, an image of the game instructions will display.

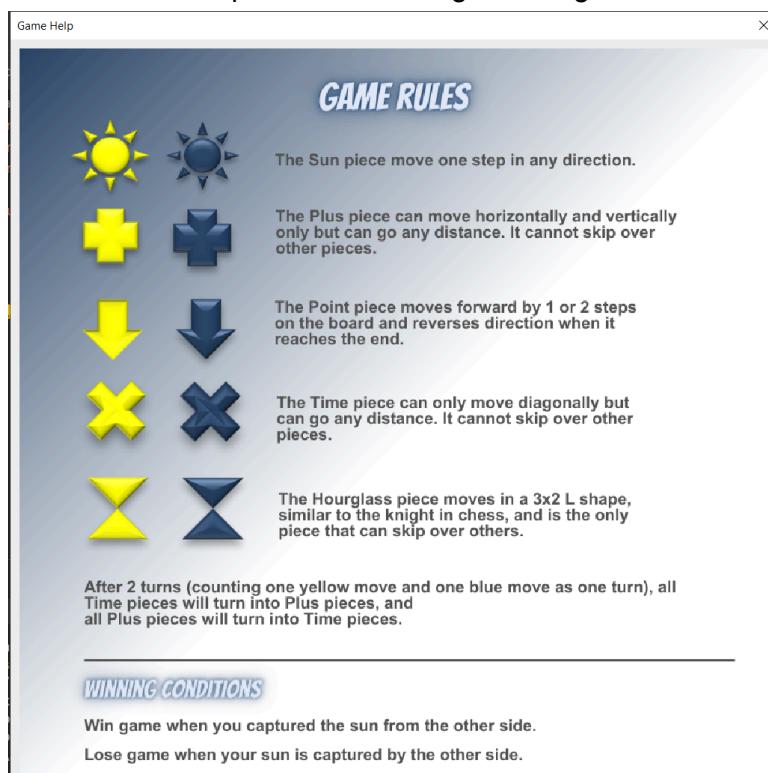


Figure 5.4.1 - Game help image

5.5 Save Game:

After the player has started a new game, he can save the current game state by clicking the “Save” button. Once the player has clicked on the “Save” button, an input dialogue will pop up, requesting the user to enter a file name. The current game state will then be saved in a text (.txt) format.

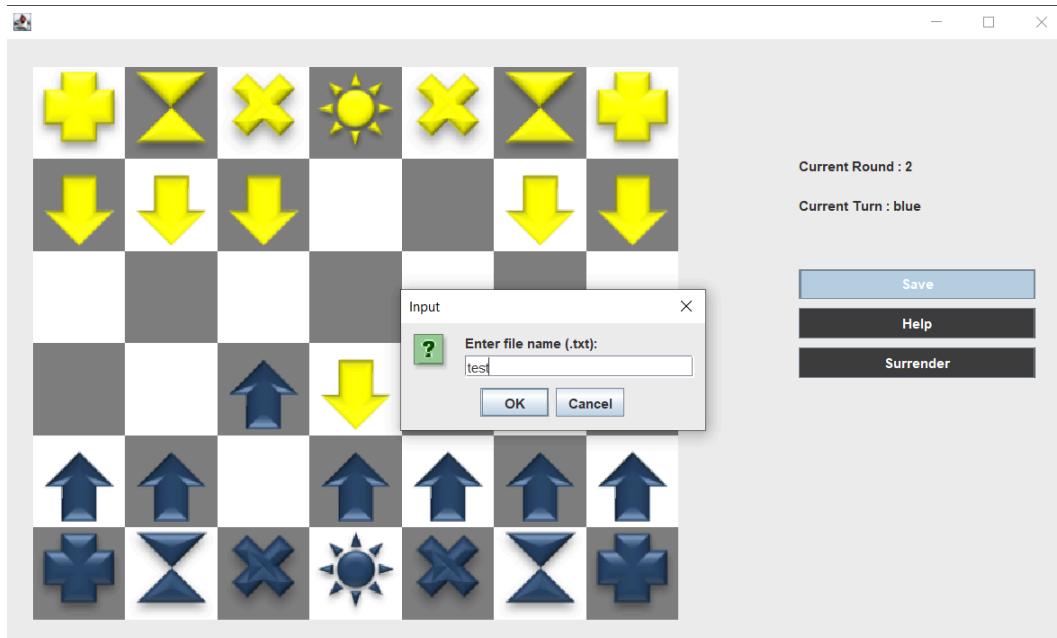


Figure 5.5.1 - Click Save button and Enter file name for save game

After the player pressed “OK”, he can continue playing the game. The player can find the saved text file of the game like the following:

```

≡ test.txt
1 Round: 1
2 Current Player: Blue
3 0,0,Plus,false,false
4 0,1,Point,false,true
5 0,2,null,false,false
6 0,3,null,false,false
7 0,4,Point,true,false
8 0,5,Plus,true,false
9 1,0,Hourglass,false,false
10 1,1,Point,false,true
11 1,2,null,false,false
12 1,3,null,false,false
13 1,4,Point,true,false
14 1,5,Hourglass,true,false
15 2,0,Time,false,false
16 2,1,Point,false,true
17 2,2,null,false,false
18 2,3,Point,true,false
19 2,4,null,false,false
20 2,5,Time,true,false
21 3,0,Sun,false,false
22 3,1,null,false,false
23 3,2,null,false,false
24 3,3,Point,false,true
25 3,4,Point,true,false
26 3,5,Sun,true,false
27 4,0,Time,false,false
28 4,1,null,false,false
29 4,2,null,false,false
30 4,3,Point,false,true
31 4,4,Point,true,false
32 4,5,Time,true,false
33 5,0,Hourglass,false,false
34 5,1,Point,false,true
35 5,2,null,false,false
36 5,3,null,false,false
37 5,4,Point,true,false
38 5,5,Hourglass,true,false
39 6,0,Plus,false,false
40 6,1,Point,false,true
41 6,2,null,false,false
42 6,3,null,false,false
43 6,4,Point,true,false
44 6,5,Plus,true,false

```

Figure 5.5.2- test.txt file

The saved text file will contain the current round when saved, the current player, and chess piece information on each coordinate. If the player saves another file with the same name, it will then replace the older version. In the text file, the current round starts from 0 since the round index starts from 0, whereas when displayed on screen it will start from 1. So in this case, it is round 2 on the screen displayed, hence in the text file, it will be round 1.

5.6 Load Game:

Player clicks the “Load” button on the home page, then selects the file that is currently saved and clicks open. The player can continue the game after loading the saved game state.



Figure 5.6.1 - Load button in home page

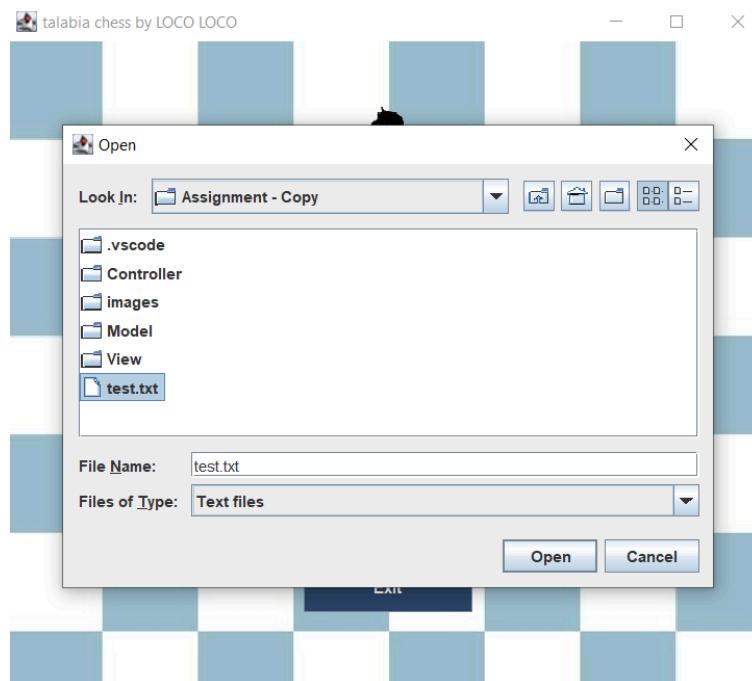


Figure 5.6.2- Select file to load

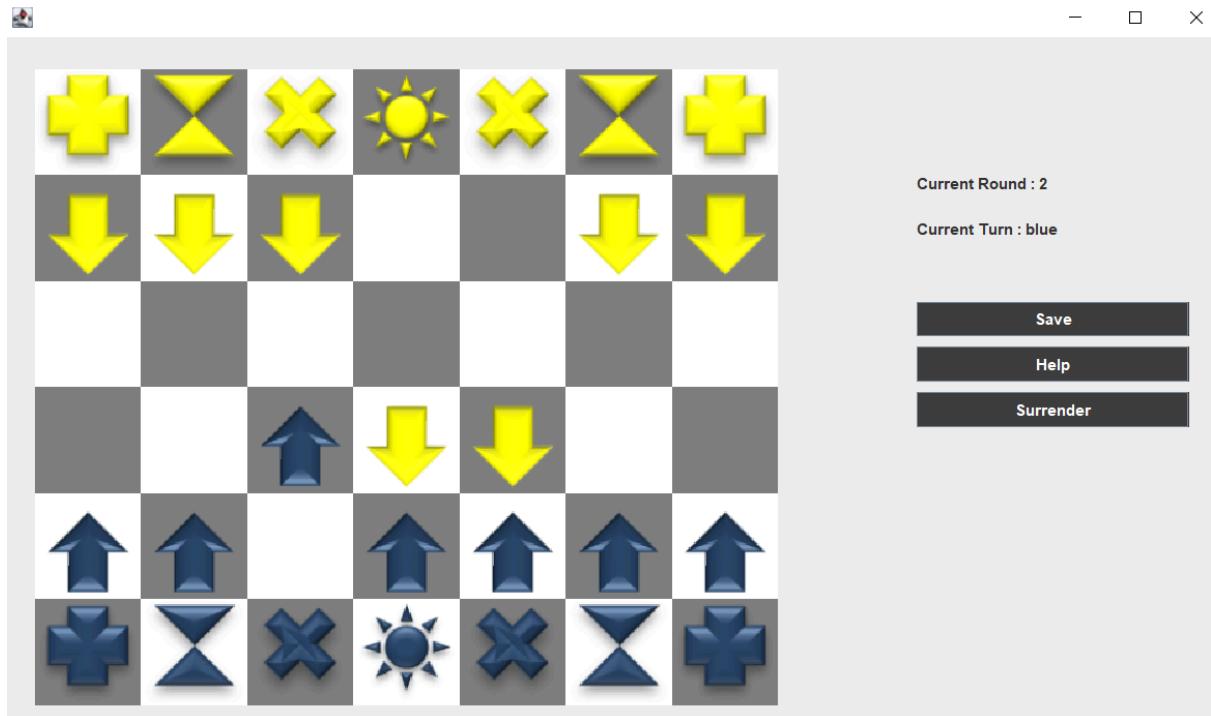


Figure 5.6.3 After loading the file

5.7 Select Piece:

The player can select a piece by clicking on a chess piece. When a chess piece is selected, it displays the available path that the chess piece can move to as well as the message of the piece that is selected.

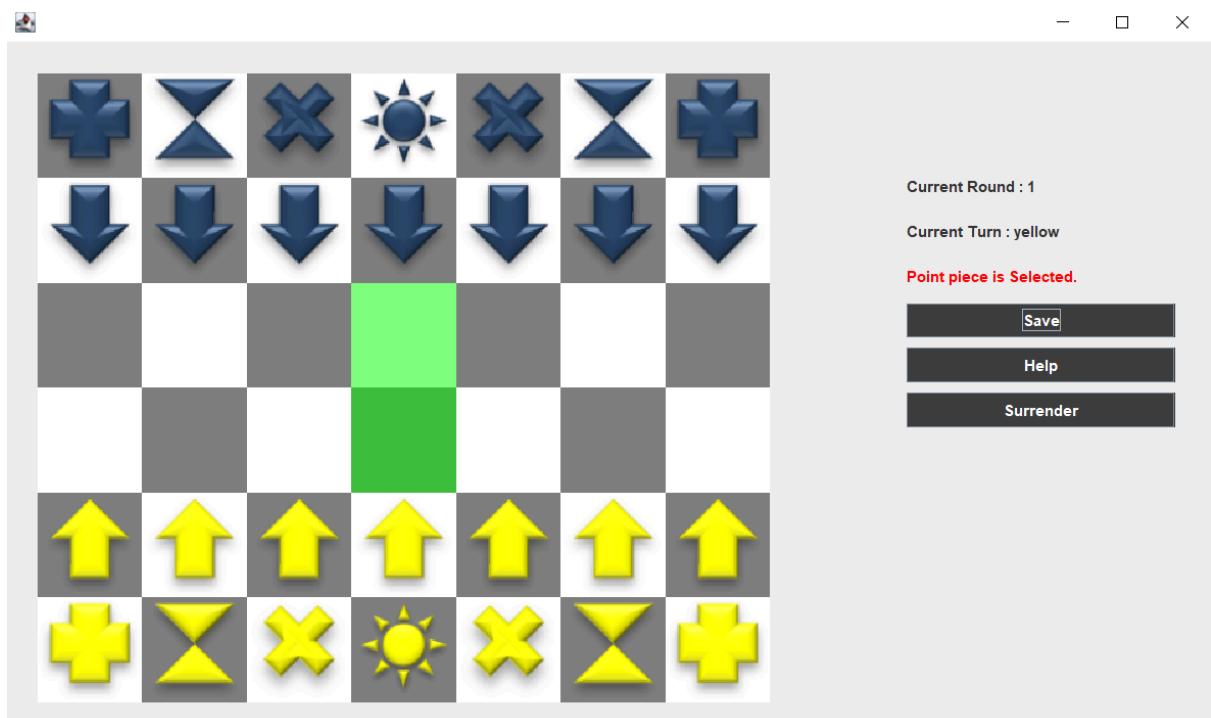


Figure 5.7.1.- Select piece

Deselect Piece:

The piece is deselected by double clicking on the same piece, the player is informed about the deselection when the sidebar message is empty.

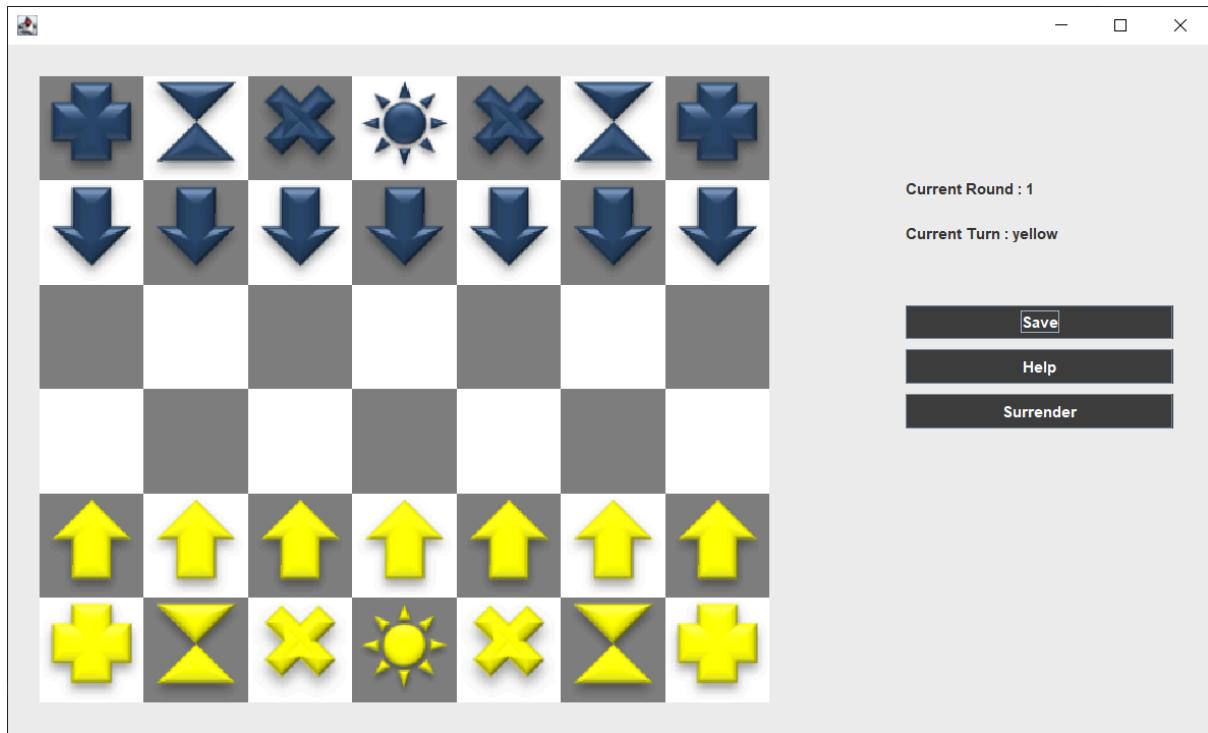
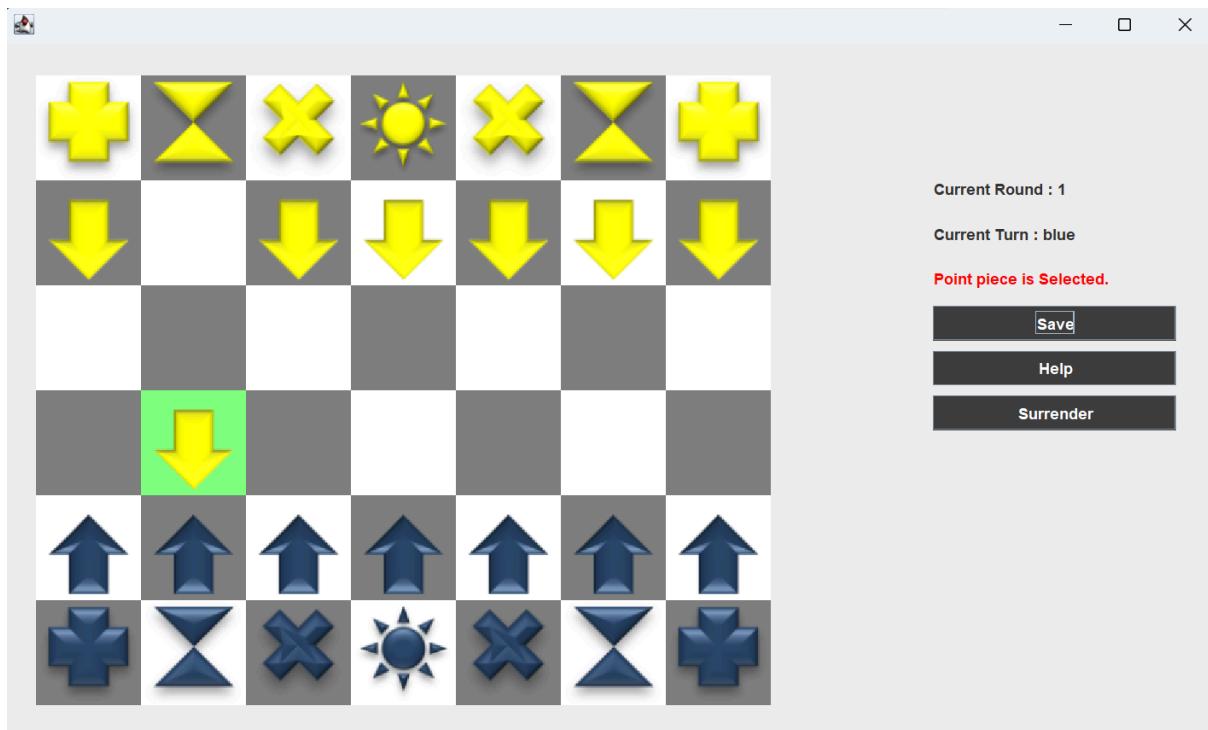


Figure 5.7.2- Deselect piece

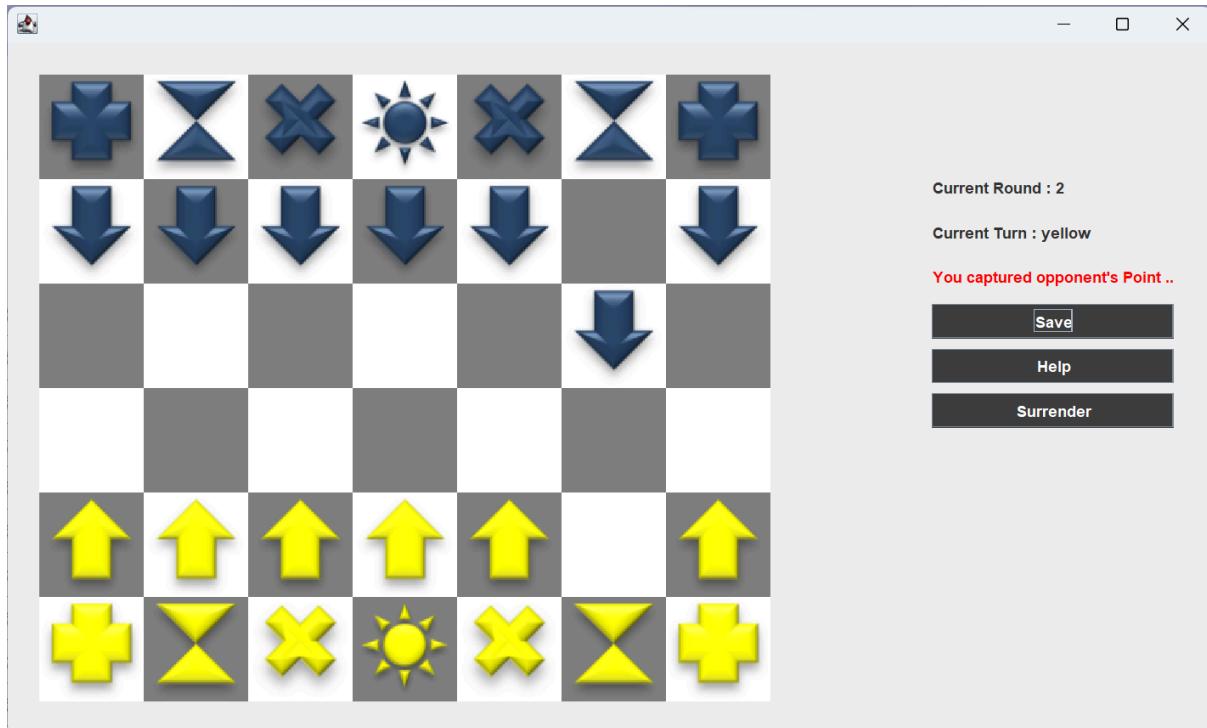
5.8 Move Piece:

Once the available pieces are shown and the player clicks on it, the chess piece will move its place. In this case, the blue point can capture the yellow point

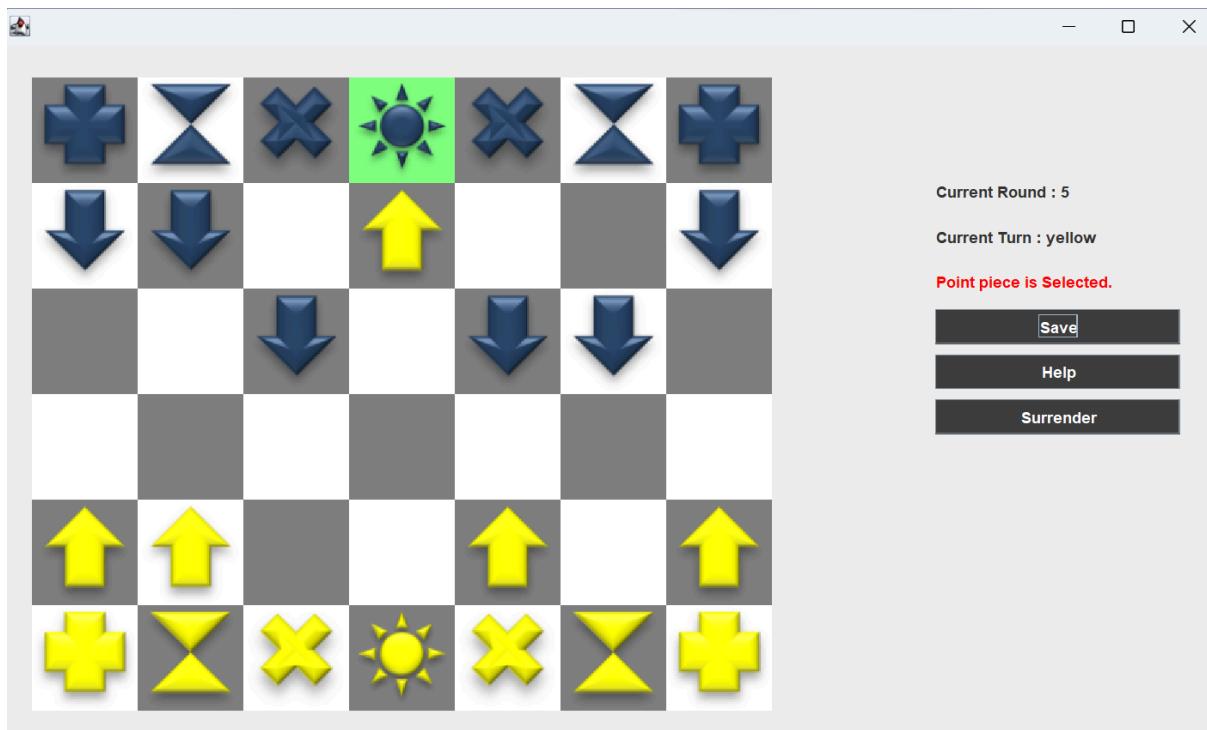


Capture Piece:

(Continued from 'Move Piece'), Once the player clicks the yellow point, the blue point will capture the yellow point.



Once the player captures the opponent's sun piece, the game will end.



game-over pop-up will show.



5.9 Surrender:

Once the player clicks on the “Surrender” button, a message pops up for the player to confirm. If the player clicks on “yes”, the system shows a message with a GAME OVER image with an indication of which player has surrendered and returned back to the home page. It will return back to the game board if the player clicks on “no”.

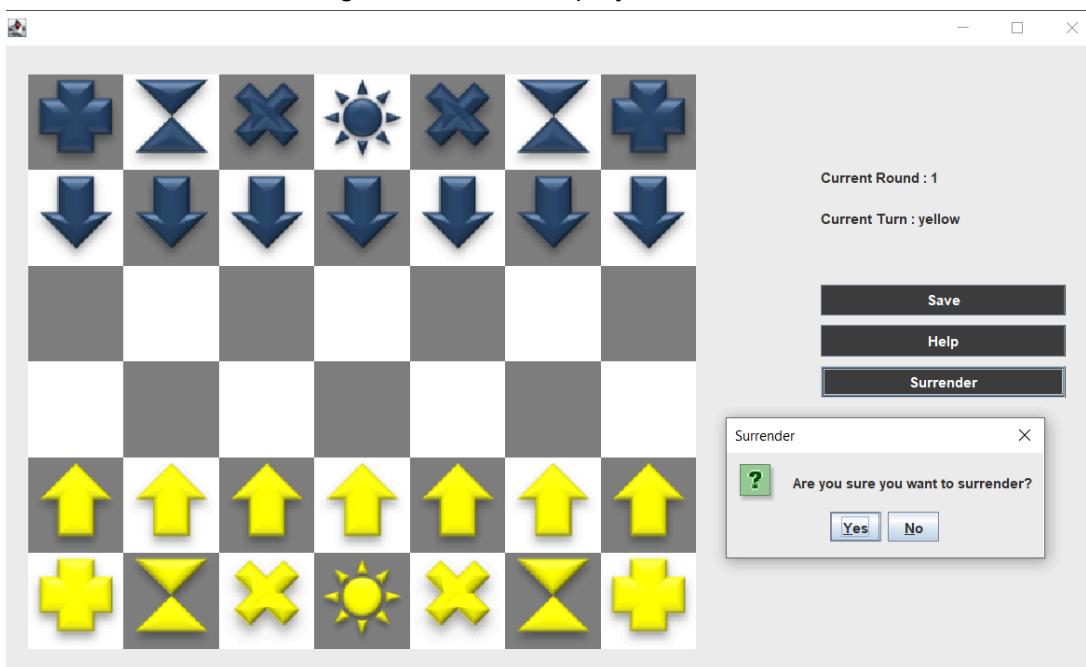


Figure 5.9.1 - Surrender confirmation message

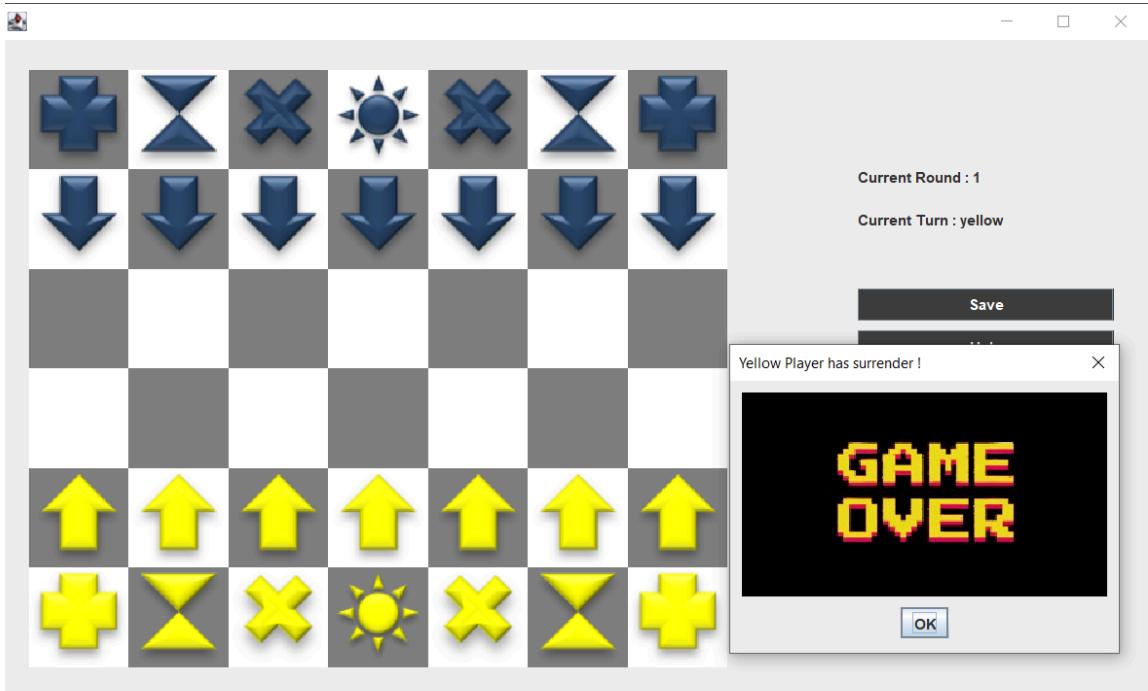


Figure 5.9.2 - Game over message

5.10 Chess Piece Movement :

5.10.1 Point Piece:

When the player clicks on the “Point” piece, the moveable squares will be shown in green. Since the “Point” piece can move one or two steps and the square is occupied by the blue player’s chess piece, the two squares in front of the “Point” piece will be shown in green.

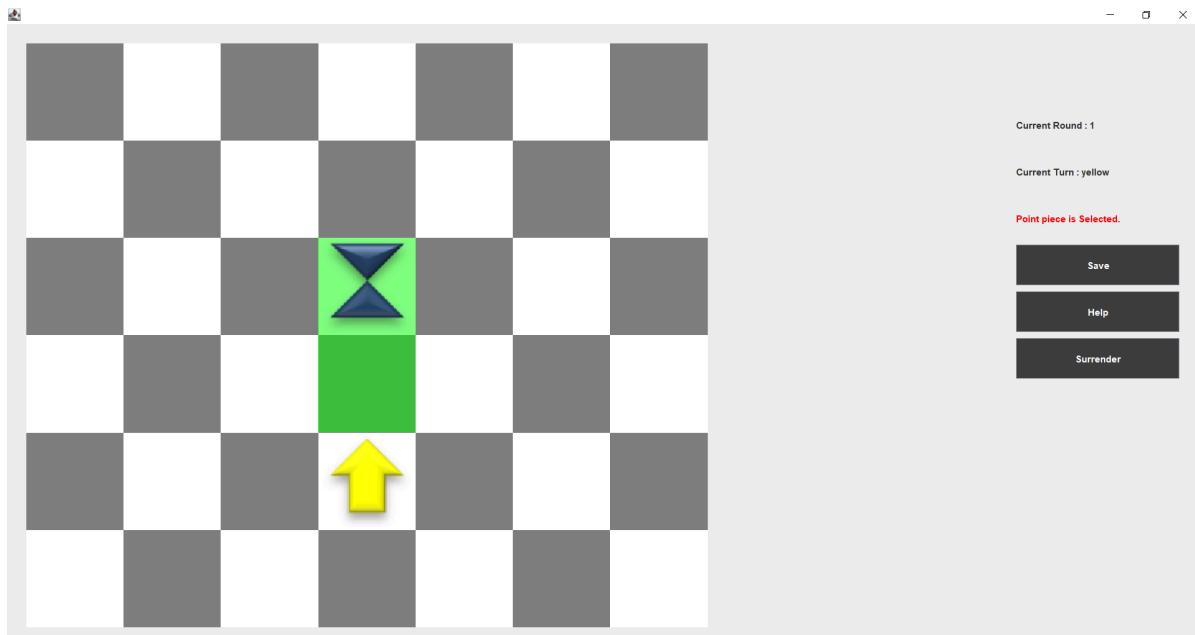


Figure 5.10.1.1 - “Point” piece available moves (occupied by an opponent’s piece)

Since the second square is occupied by the player’s own piece, the only moveable square is one step in front of the “Point” piece.

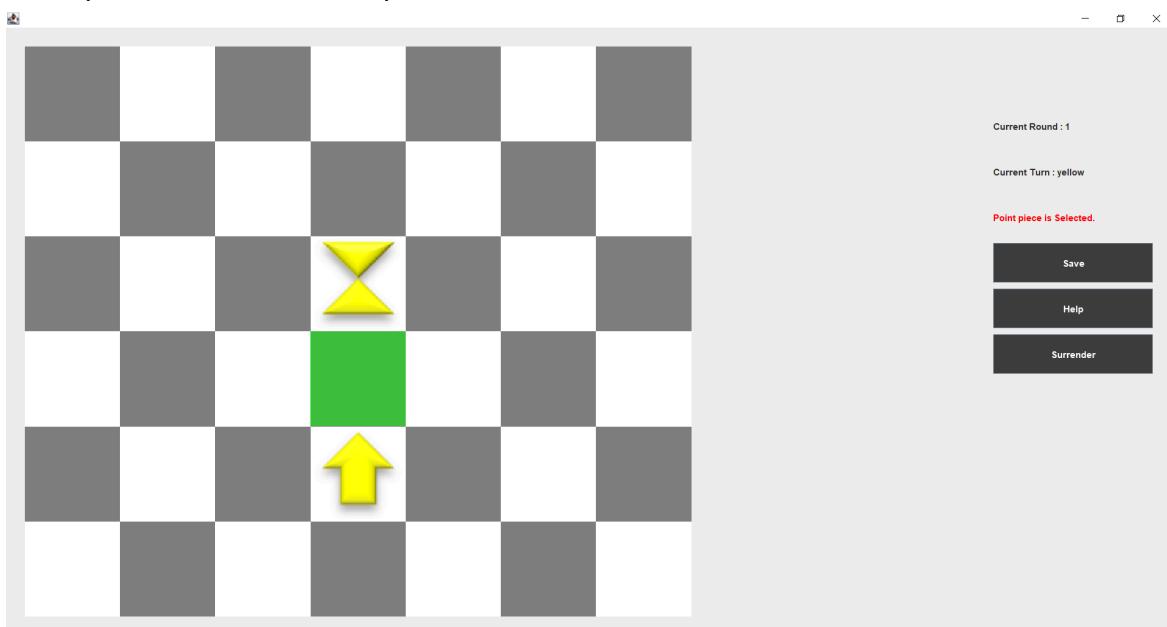


Figure 5.10.1.2 - “Point” piece available moves (occupied by own piece)

When the “Point” piece hits the border, it is flipped.

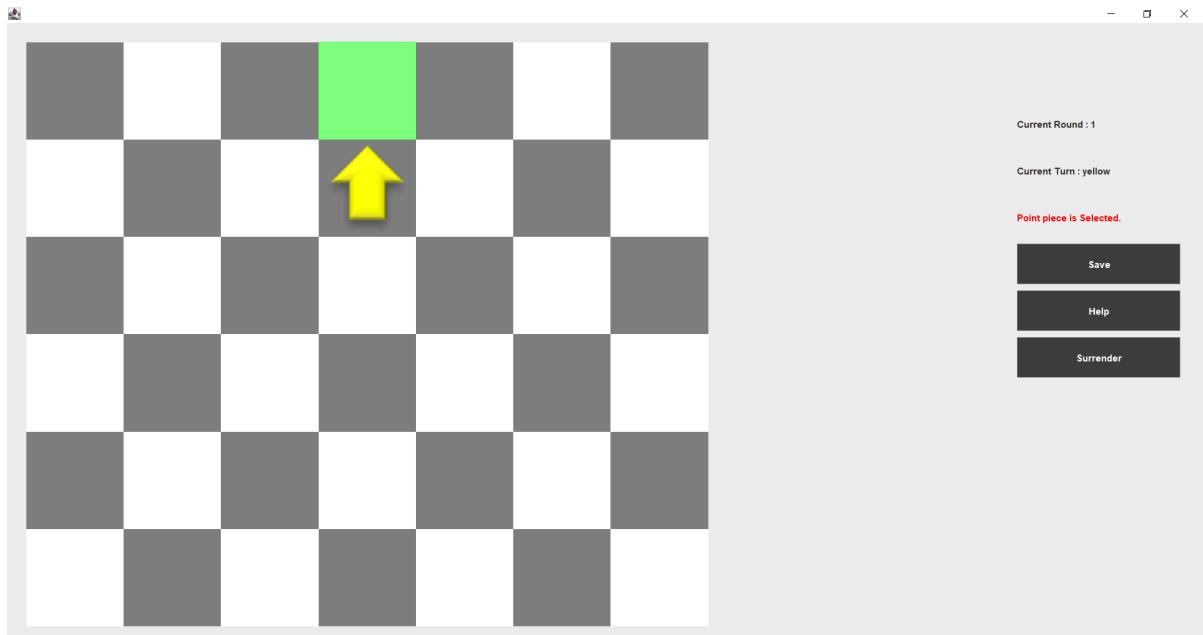


Figure 5.10.1.3 - Hit the border

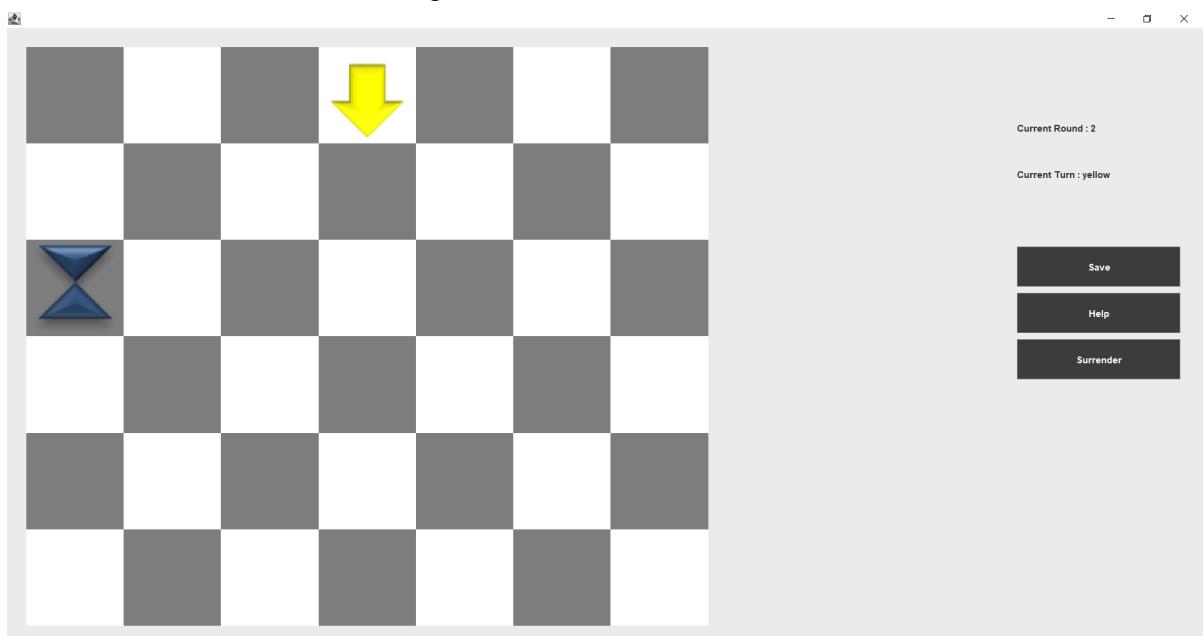


Figure 5.10.1.4 - The “Point” piece is flipped

5.10.2 Sun Piece:

When the player clicks on the “Sun” piece, the board displays the available moves that the piece can move to, the “Sun” piece can move 1 step in any direction. The “Sun” piece can capture its opponent piece, as illustrated in Figure 5.10.2.2. The “Sun” piece can’t move to the location if another same colour piece blocks the location.

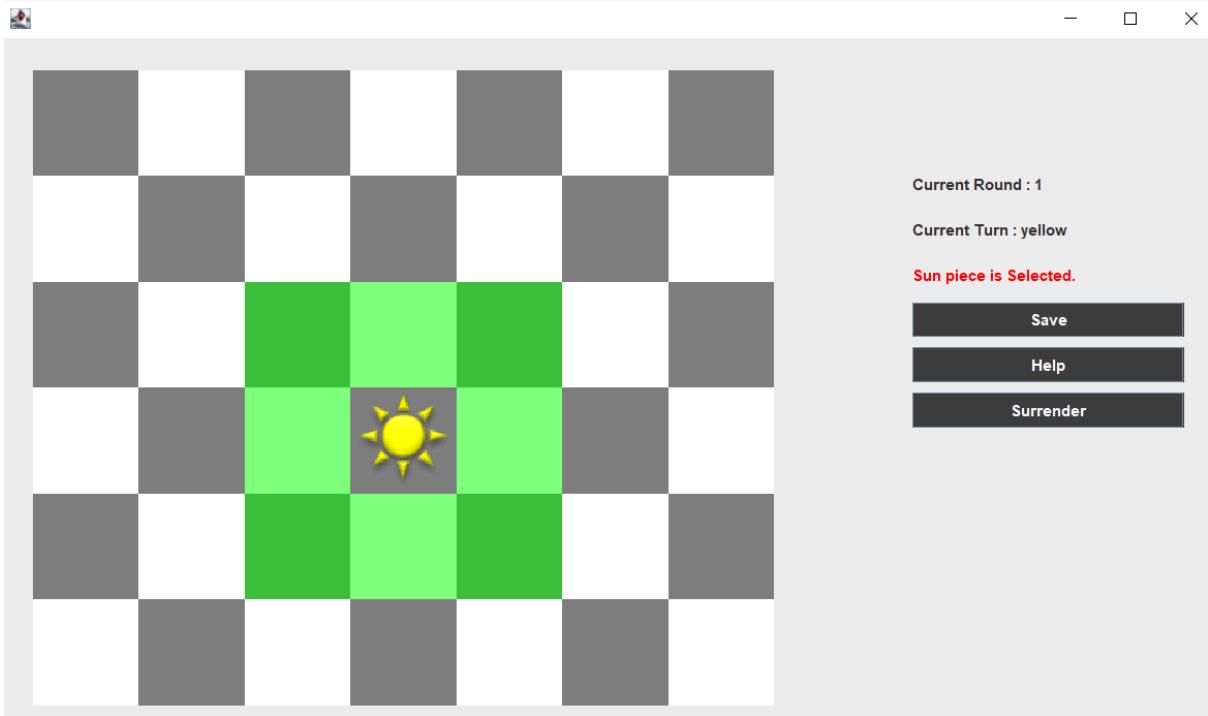


Figure 5.10.2.1 - “Sun” piece available moves

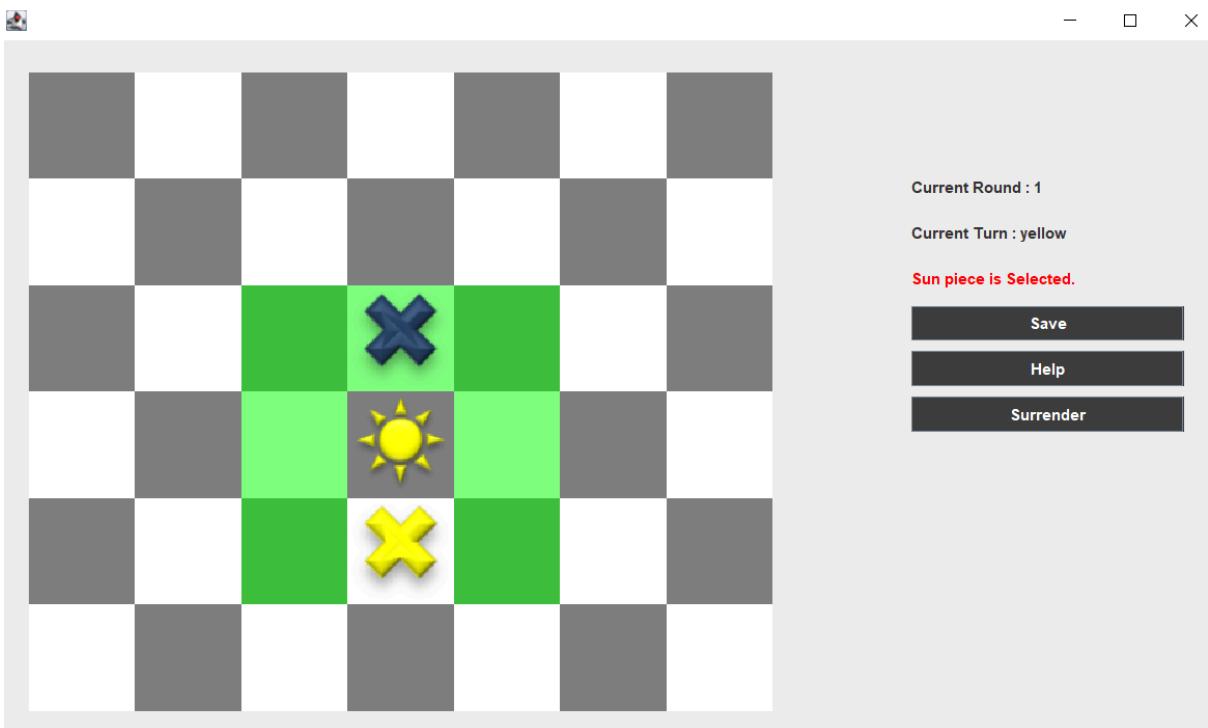


Figure 5.10.2.2 - “Sun” piece restrictions (occupied by opponent and own chess piece)

5.10.3 Hourglass Piece:

When the player clicks on the “Hourglass” piece, the board will display all the available moves with green colour tiles. Hourglass can move any direction with 3x2 (or 2x3) within the board.

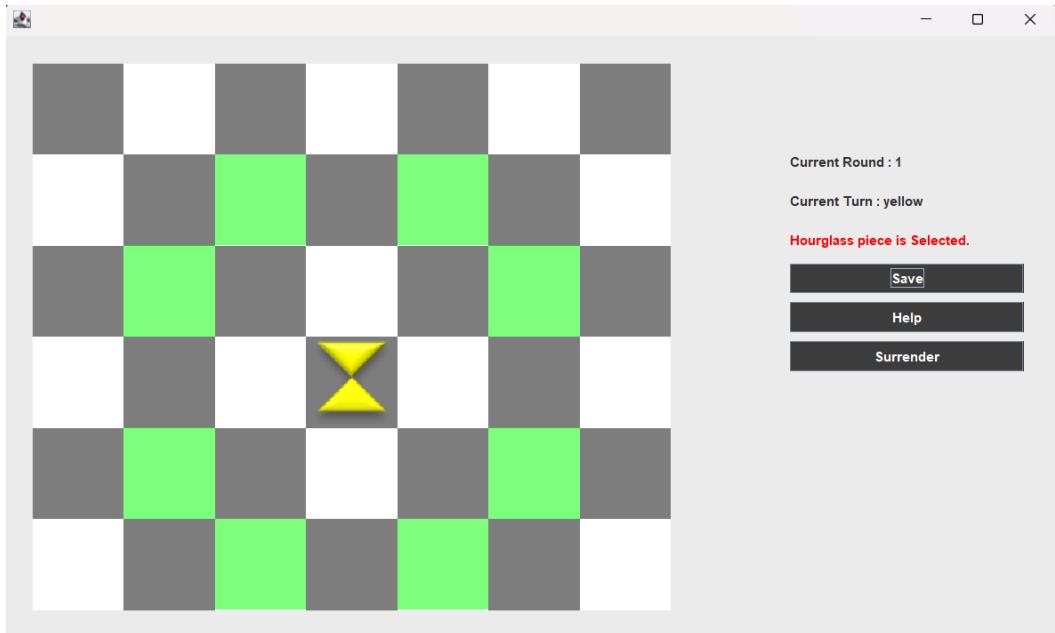


Figure 5.10.3.1 “Hourglass” piece available moves

Since hourglass can skip through the pieces, nothing will affect its movement unless there is the player's own piece on the available move tile. Else if it is the opponent's chess piece on the available move tile, the hourglass can choose to capture it.

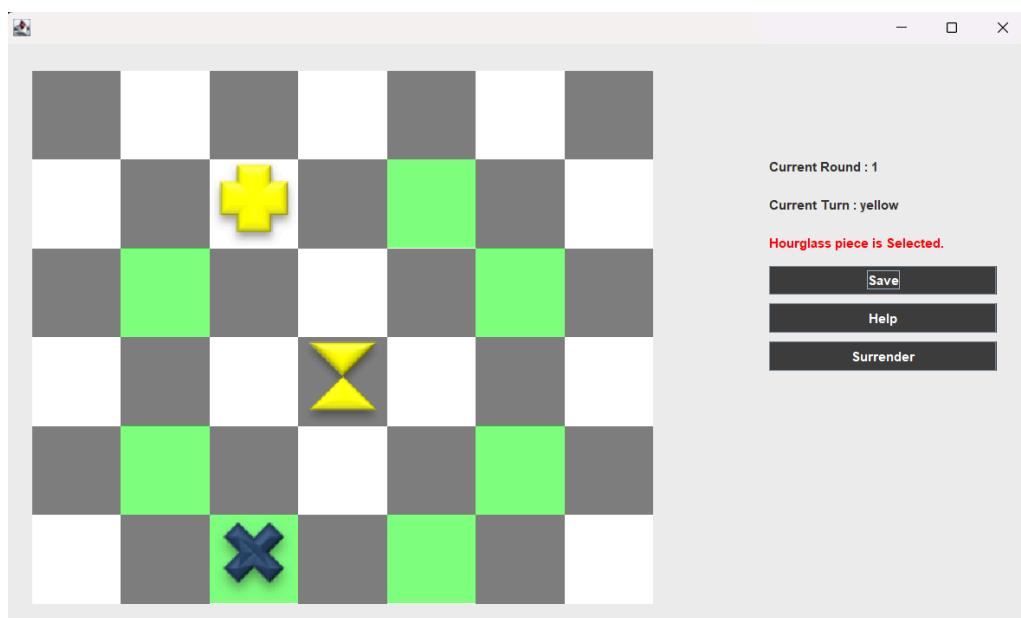


Figure 5.10.3.2 “Hourglass” piece restrictions (occupied by opponent and own chess piece)

5.10.4 Time Piece:

When the player clicks on the “Time” chess piece, the moveable squares will be shown in green. The “Time” piece can move diagonally in any direction, as long as it is within the board, and no other chess pieces are in its way.

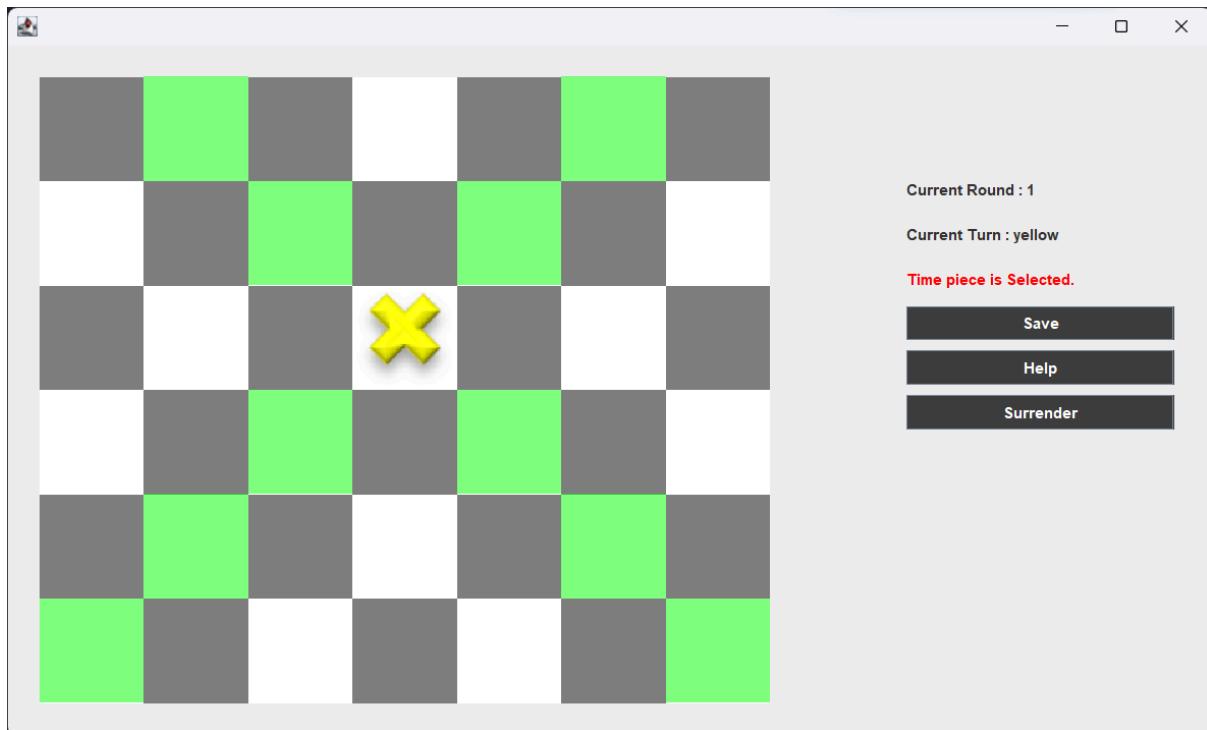


Figure 5.10.4.1 “Time” piece available moves

When there are chess pieces in its way (available movements), there will be restrictions. If it is the opponent's chess piece (Blue Hourglass), the “Time” chess piece is allowed to capture it, but not allowed to skip over the chess piece. On the other hand, if it is a chess piece of its own (Yellow Plus), the “Time” chess piece is only allowed to move until the coordinates before the chess piece of the same colour, which means it cannot skip the chess pieces.

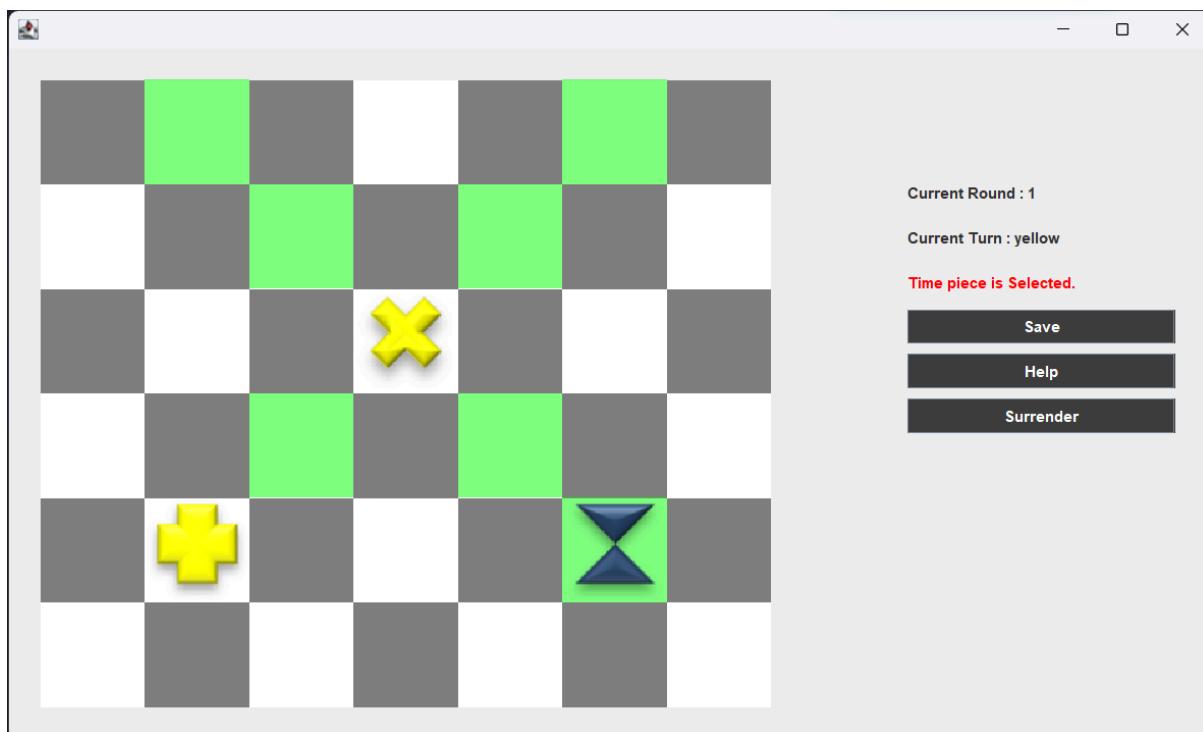


Figure 5.10.4.2 “Time” piece restrictions (occupied by opponent and own chess piece)

5.10.5 Plus Piece:

When the player clicks on the “Plus” chess piece, the moveable squares will be shown in green. The “Plus” piece can move vertically and horizontally, as long as it is within the board, and no other chess pieces are in its way.

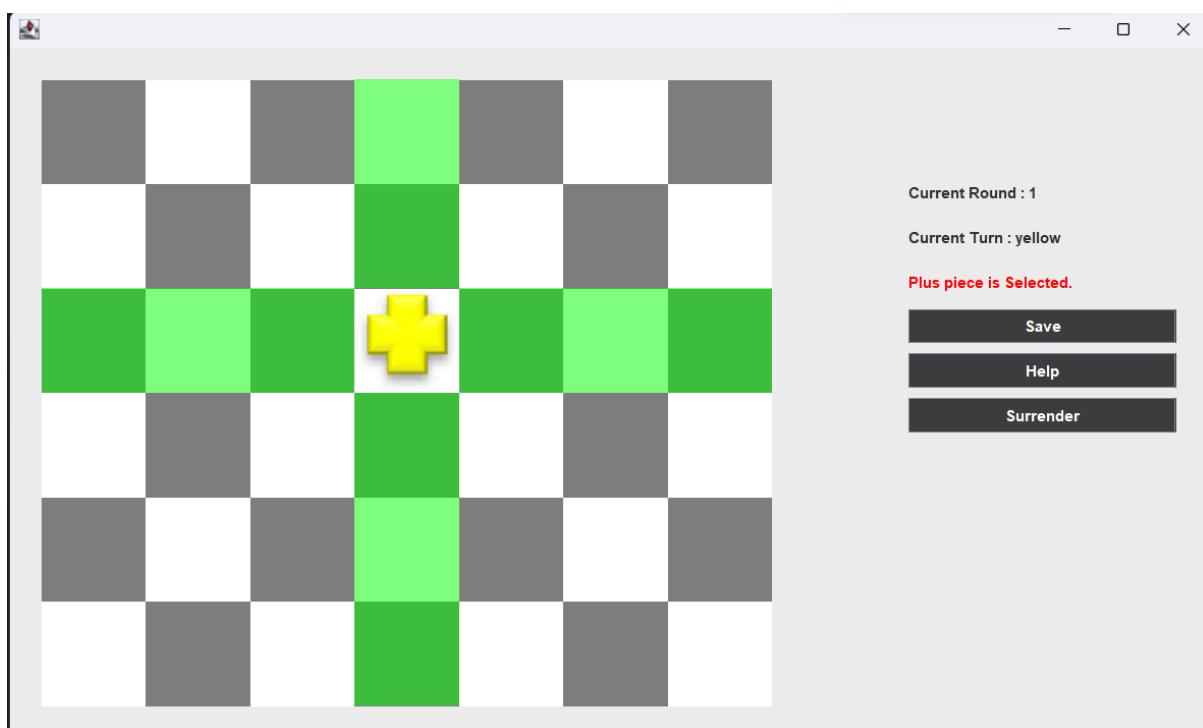


Figure 5.10.5.1 “Plus” piece available moves

When there are chess pieces in its way (available movements), there will be restrictions. If it is the opponent's chess piece (Blue Hourglass), the "Plus" chess piece is allowed to capture it, but not allowed to skip over the chess piece. On the other hand, if it is a chess piece of its own (Yellow Times), the "Plus" chess piece is only allowed to move until the coordinates before the chess piece of the same colour, which means it cannot skip the chess pieces.

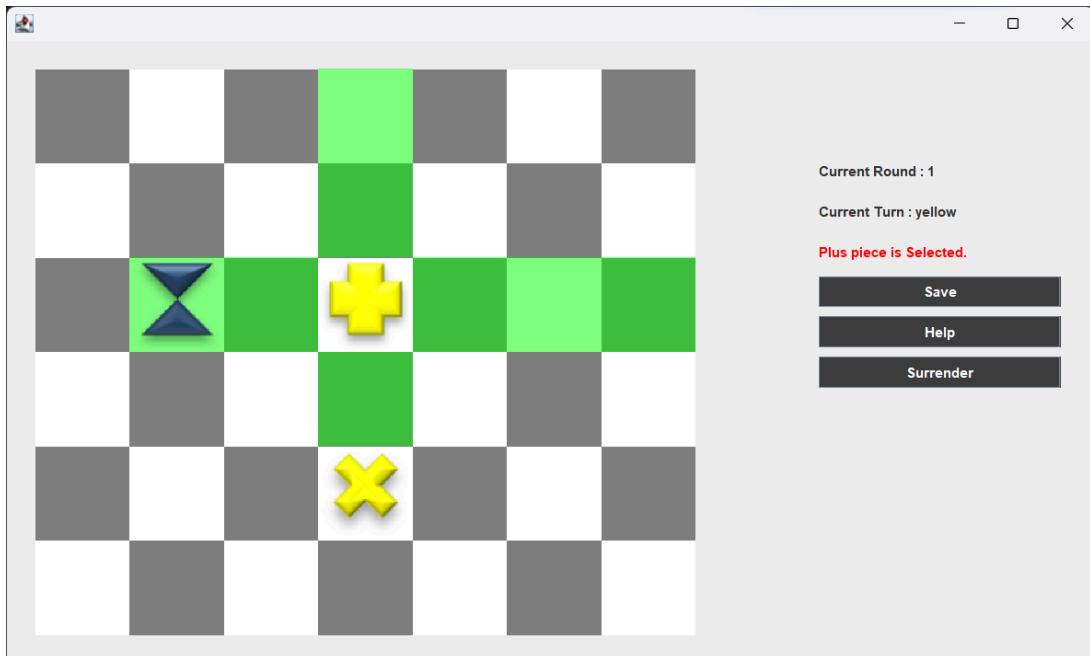


Figure 5.10.5.2 "Plus" piece restrictions (occupied by opponent and own chess piece)

5.10.6 Pieces Conversion

After 2 rounds (counting one yellow move and one blue move as one round), all the "Time" chess pieces will change to "Plus" pieces, and all the "Plus" pieces will change to "Time" chess pieces.

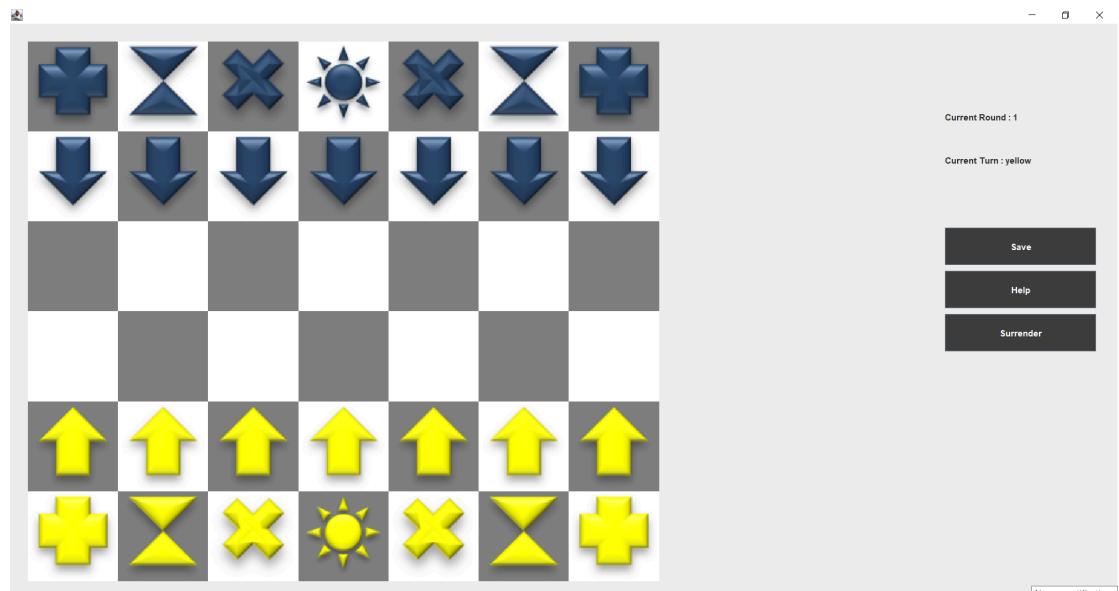


Figure 5.10.6.1 - Default game board

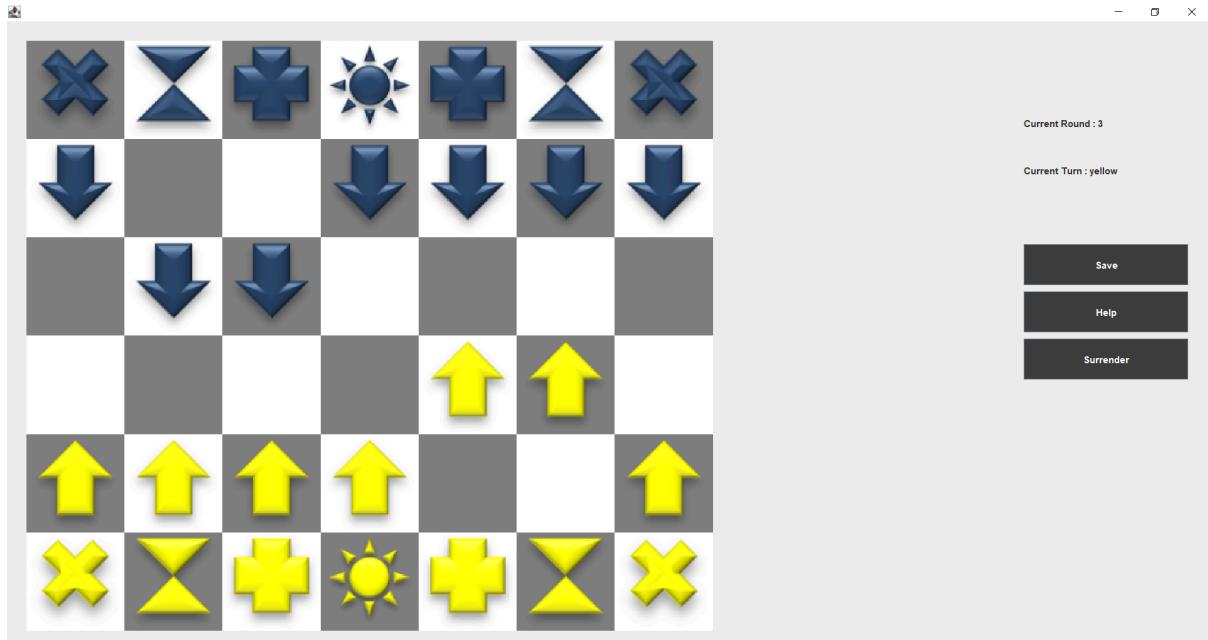


Figure 5.10.6.2 - After two rounds, pieces conversion