

# YOUR MOVE v1.1

## User Manual

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### King's Sacrifice

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# Glossary

- **Pieces:**

1. Pawn:

- Can only move forward
- Can move two or one space initially
- Can move only one space after
- Can attack one space diagonally

2. Knight:

- Can only move in an “L-shape” (either move two spaces vertically followed by one space horizontally or move two spaces horizontally followed by one space vertically)
- Can move a total of three spaces
- Can attack another piece according to the L-shape

3. Bishop:

- Can move diagonally backward or diagonally forward
- Can move any number of spaces in a single move
- Can attack in any direction and move any number of spaces while attacking

4. Rook:

- Can move vertically backward or vertically forward and horizontally (left and right)
- Can move any number of spaces in a single move
- Can attack in any direction and move any number of spaces while attacking

5. Queen:

- Can move in any direction (forward, backward, diagonal, horizontal)
- Can move any number of spaces
- Can attack in any direction and move any number of spaces while attacking

6. King:

- Can move in any direction
- Can only move one space
- If it can be attacked in the next move, player must move this piece to safety (CHECK)
- If it can be attacked in the next move and the player has no spaces to ensure safety, player loses the game (CHECKMATE)

- **Endgame:**

1. Checkmate:

If a king is currently being attacked and the king has no safe spaces to move to, the player to whom the king belongs loses.

2. Stalemate:

If moving a king is the only legal move a player can make and the king is currently in a safe position, but all spaces where the king can move are being attacked, it is a stalemate and is considered a draw.

3. Fifty Move Rule:

The game is declared a draw if no piece has been captured or no pawn has been moved for 50 consecutive turns of a single player.

4. Insufficient Material Draw:

If both sides have any of the following scenarios:

- only king surviving
- only a king and a bishop surviving
- only a king and a knight surviving

5. Out of time:

If a timer exists and a player is out of time, it is considered a defeat for that player and the other player wins.

- **Special Moves:**

1. Castling:

- The king may move two squares to either side, with the rook moving to the other side of the king. Not a legal move if either piece has moved or if the king is currently checked.

2. En Passant:

- a special pawn capture which can occur immediately after a player moves a pawn two squares forward from its starting position, and an enemy pawn could have captured it had the same pawn moved only one square forward. The opponent captures the just-moved pawn as if taking it as it passes through the first square. The resulting position is the same as if the pawn had moved only one square forward and the enemy pawn was captured normally. The En Passant capture must be done on the very next turn, or the right to do so is lost. Such a move is the only occasion in chess in which a piece captures but does not move to the square of the captured piece. If an En Passant capture is the only legal move available, it must be made.

- **Other:**

1. Check:

- When one of a player's pieces is attacking the opponent's king or vice versa. Unlike checkmate, here the king can be protected by moving it in another location or blocking the path of attack with another piece.

2. Capture:

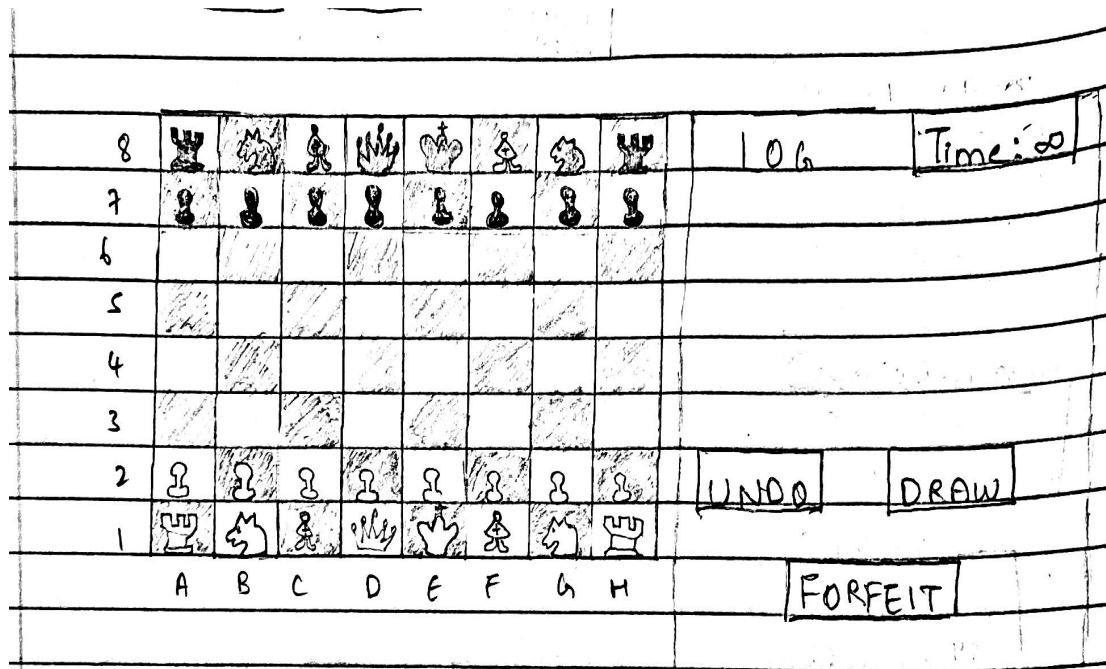
- When one of a player's pieces takes the position that was previously held by an opponent's piece or vice versa through a legal move. The piece which initially held the position is removed from the game (no longer on the board), i.e the player cannot use it.

3. Pawn Promotion:

- A player can switch a pawn for a queen, a rook, a bishop, or a knight in the eighth rank for a White pawn and in the first rank for a Black pawn

# Computer Chess

## 1.1 Usage scenario



*Fig 1: Chess Board*

Figure 1 illustrates a chess board with initial setup. Player can click on one piece and then click its available destination to make a movement. The movement will be recorded in the LOG on the right. Timer is in the top right corner. Players can choose to turn on or turn off (infinite time) the timer. There are also some option buttons on the right. Undo allows players to go back a move. Draw is used to request for a draw. Players can use Forfeit to resign the game.

## 1.2 Goals

The goal of the game is to capture the opponent's king. The way this is completed is by first choosing your player (white or black) and then using your pieces to move across the board (capturing pieces as you go). As you traverse the board, you may want to try to capture pieces that are of more importance so that it will be easier to protect your own king and capture the opponent's king.

### 1.3 Features

- Home page:
  - Screen that the user sees when game is opened (executable is run)
  - Allows the user to customize the game by clicking on the desired options
- Mode:
  - Allows the user to choose the players of the game
- Players:
  - Allows the user to choose who starts first (who will move the white pieces)
- Difficulty level:
  - If the user chooses a mode where the computer is one or both the players, the user can choose how well the computer plays the game.
- Timer:
  - The user can choose whether to use a timer (1 minute per move) or no timer when playing.
- Chess Pieces:
  - The chess pieces on the board (Pawn, Knight, Bishop, Rook, Queen, King).
- Moving Pieces:
  - Player can click on the piece and click on the position where the player desires to move the piece.
- Capturing Pieces:
  - Players can click on their piece and then the opponent's piece which they desire to capture.
- Check and Checkmate:
  - The program checks for possible check and checkmate after each move.
- Endgame:
  - The other ways to end a game (Stalemate, 50 Move Rule, Insufficient Material).
- Undo:
  - The player can go back a move.
- Resign/Draw:
  - The player can propose a draw or resign the game (lose)

# Installation

## 2.1 System requirements

	Minimum Requirements
CPU	x86_64
Operating System	Linux
Internet	Broadband Internet connection
Resolution	1024x768 Display Resolution

## 2.2 Setup and configuration

If using Windows, open a terminal window via ssh (Putty is commonly used). Connect to one of the following UCI linux servers:

“Your user name”@bondi.eecs.uci.edu

“Your user name”@crystalcove.eecs.uci.edu

“Your user name”@laguna.eecs.uci.edu

If using Mac, open the terminal program and create a new remote connection to connect to one of the previously listed UCI linux servers.

To install the binary package, enter the following commands

```
% gtar xvfz BinaryArchive.tar.gz
```

```
% evince chess/doc/chess.pdf
```

```
% chess/bin/chess
```

## 2.3 Uninstalling

You can uninstall *Your move* and all of its components by exiting the game directory and utilizing the “rm” command to remove it.



# **Chess Program Functions and Features**

## **3.1 Function 1: Home Page:**

- User can interact and customize the game as per the following options:
  - Mode: The user can select different modes in order to change their playing experience. The various modes are as follows:
    - Player vs Player
      - This mode allows the user to play against another person. This works by having one side make their move and then the other user can make their move until the game is finished.  
Note: Both players will be entering their moves on the same terminal
    - Computer vs Computer
      - This mode allows the user to watch the computer play against the computer. The user will not be able to enter any moves during the match.
    - Player vs Computer
      - This mode allows the user to play against the computer. The user will be able to make their chess move and then the computer will make their move in response.
  - Player: The user has the option to select two different colors of player. The options are white and black
    - White
      - If the user chooses white, they will be allowed to move first
    - Black
      - If the user chooses black, they will be allowed to move after white has made their move
  - Difficulty Level: The user can choose the computer's difficulty level as: Rookie, Master, Grandmaster
    - Rookie: Player has an unlimited number of undos.
    - Master: Player only has three undos for the entire game
    - Grandmaster: Player is banned from undo.



Fig 2: Menu showing difficulty levels, mode, player and timer

- Timer: Player can choose if he wants a clock. The timer is available to view in the top right corner.

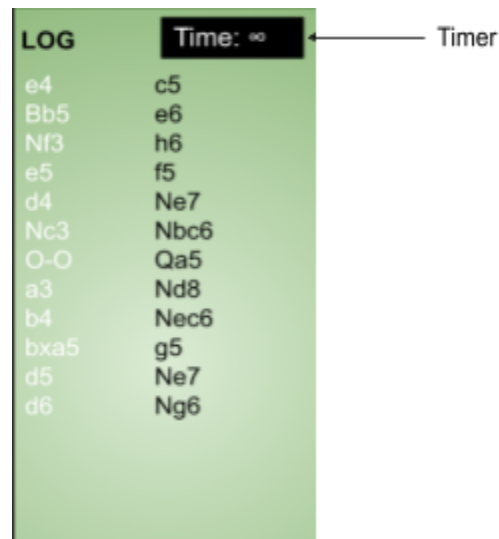


Fig 3: Part of home page showing timer

### 3.2 Function 2: Moving pieces:

- The game uses the click to move function to allow the user to move the pieces around. The user is required to click on the piece he would like to move and then click the desired position of where he would like to move the piece to.
- The program checks if the move is a legal one. If it is a legal move, the piece is moved to the desired positions.
- If a move is illegal, the program informs the user that the move made was illegal and the board remains unchanged until the user makes a valid move.
- After every move, the program checks if there is a “check”, “checkmate” or “capture”.
  - i. If there is a “check”, the program informs the user that their king is in “check”. The user is required to get out of the “check” during his move. Any other move that doesn’t remove the check is considered to be illegal.
  - ii. If there is a “checkmate”, the player whose king is in “checkmate” loses and the other player is declared the winner.
  - iii. When a piece is captured, the captured piece is removed from the board and the piece that did the capturing takes the place of the captured piece on the board.



*Fig 4: Illegal Move*

### 3.3 Function 3: Log the game:

Logs the moves made by both players in the table on the right of the gameboard. Uses chess terms to log the game.

Terms:

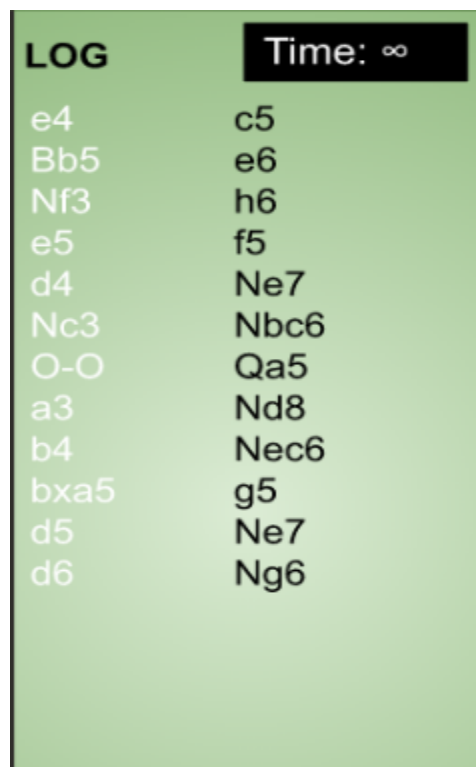
x: captures

0-0: kingside castle

0-0-0: queenside castle

+: check

#: checkmate



LOG	Time: ∞
e4	c5
Bb5	e6
Nf3	h6
e5	f5
d4	Ne7
Nc3	Nbc6
O-O	Qa5
a3	Nd8
b4	Nec6
bxa5	g5
d5	Ne7
d6	Ng6

*Fig 5: Part of home page showing log*

### 3.4 Function 4: Undo:

Allows the player to go back in case of a “blunder”. Moves back two moves (one move each player). Only available in the game mode: Player vs Computer.

Whether undo is enabled and the amount of undos the player gets is based on the difficulty of the game:

1. Rookie: unlimited number of undos
2. Master: maximum of three undos for the entire game
3. Grandmaster: undo is disabled

### 3.5 Function 5: Resign or propose a draw:

This function allows the user to resign/ call a draw during the game.

- Resign:  
When one player resigns the game, the other player automatically wins.
- Draw:
  - In the case of Player vs Player, if a player proposes a draw during the game, the program will request for the opponent's agreement. If both of the players agree on a draw, neither player wins and it's a draw.
  - In the case of Player vs Computer, the computer will accept or reject the draw according to the current game state.



Figure 6: Resign or draw

### 3.6 Function 6: End game:

The game ends when one player captures the other player's king(checkmate). After the game has ended, a popup is displayed on the screen and states which player won (either white or black). The player is then given two options after the game has ended to either start a new game or quit the game.



*Fig 7: Checkmate! Game ends*

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## **Error messages**

Illegal move - The selected chess piece cannot move to that position

Incorrect turn - Must wait until opponent finishes their turn to move your chess piece

Invalid Undo - Undo is not available for this move



# **References**

<https://www.chess.com/terms/chess>

-Resource was used to help gain a better all round knowledge of the game of chess

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