

ZotChess

User Manual Version 2.0.0



*University of California, Irvine - EECS 22L SOFTWARE ENGINEERING
PROJECT IN C LANGUAGE - Winter 2019*

TEAM 5 - 4OUR

HE, JINGTIAN
RAMOS, ROY
TANG, JOHNATHAN
TRINH, BRYAN
ZHU, KEVIN
ZOU, ZHAO

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GLOSSARY

Capture:

To remove a piece from the board via a legal move. Also called **Take**, but not **Kill**.

Castling (king side and queen side):

A move in which the king and a rook are moved at the same time. It moves the king from the center to a flank where it usually is safer, and it develops the rook. It is the only time two pieces are moved in a turn. Castling can be done on either the kingside (notated 0-0) or the queenside. See **Figure 1** on Page 4 for additional details.

Center:

The four squares in the middle of the board.

Check:

An attack on the King. "Check" does not need to be announced. The player who is checked needs to: capture the attacking piece, move the king to an unattacked square, or interpose a piece between the attacker and the king.

Checkmate:

An attack on the King where there is no way for the checkmated to finish his turn and no longer have the King attacked. The player who is checkmated loses the game.

Draw:

A game that ends without victory for either player. Most drawn games are draws by agreement. A position is said to be a draw (or a "drawn position" or "theoretical draw") if either player can, through correct play, eventually force the game into a position where the game must end in a draw, regardless of the moves made by the other player.

En passant:

[from French, "in the act of passing"] The rule that allows a pawn that has just advanced two squares to be captured by an enemy pawn that is on the same rank and adjacent file. The pawn can be taken as if it had advanced only one square. Capturing *en passant* is possible only on the next move. See **Figure 2** on Page 4 for additional details.

First player:

The expression "the first player" is sometimes used to refer to White. See **Figure 2** below for more details.

Illegal Move:

A move that is not permitted by the rules of chess. In traditional chess, an illegal move can be moving a piece into check, jumping over pieces with a Bishop, moving 5 spaces on a Knight, instead of 4, etc.

Move:

A full move is a turn by both players, White and Black.

Pins:

When a piece is attacked but cannot legally move, because doing so would expose the player's own king to the attack; or when a piece is attacked and *can* legally move out of the line of attack, but such a move would expose a more valuable piece (or an unprotected piece) to capture.

Resign:

Forfeiting the game. Generally a player resigns when checkmate is inevitable to not play out the game to its fullest extent.

Stalemate:

A position counting as a draw, in which a player is not in check but cannot move except into check. In case of a draw, neither player wins.

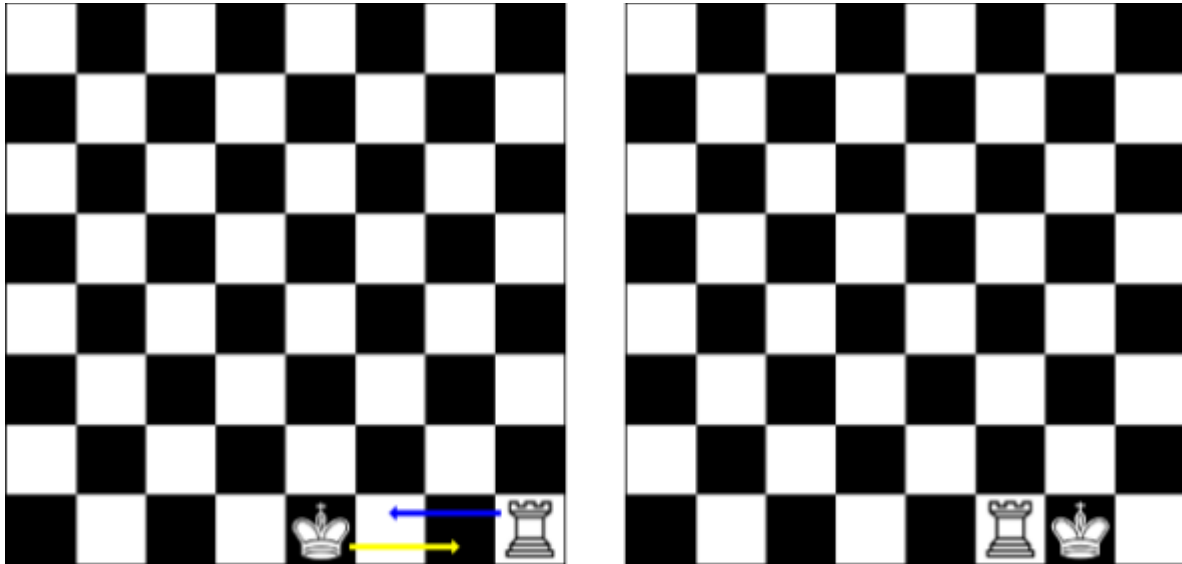


Figure 1

The board on the left is before castling, the board on the right is after King-side castling

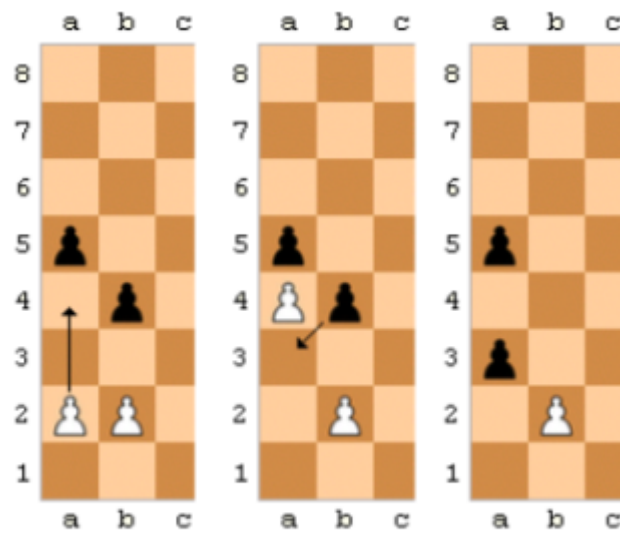


Figure 2

Black performed an en passant on White

1.0 General Information

Chess is a classic board game which consists of two players, each with their own designated set of colored pieces, see **Figure 3** to the right.

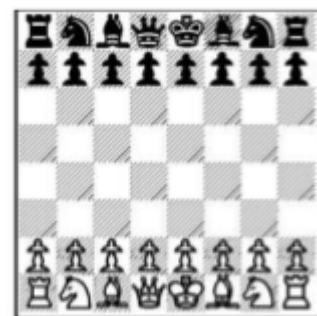


Figure 3

This is the initial set-up of an ordinary Chess game.

1.1 How to Play

- Be sure that the pieces are set up as pictured in the upper right of the page before starting the game. White pieces always goes first as each player will alternate turns for the rest of the game.
- The **Knight** is the only piece in the game that is able to jump over other pieces, other pieces may only move along open spaces or may *capture* the opposing player's piece.
- When a player *captures* the opposing player's piece with one of their own, simply remove the opposing player's piece out of the board and replace it with the capturing piece.
- The main objective is to *checkmate* your opponent's King piece. Unlike other pieces, the King will not actually be removed from the game board. Instead, the King is considered *checked* and threatened to be captured by the opponent and should get out of *check* immediately. If there is no possible option for the checked King to move from it's checked position, *checkmate* is called and the side that is *checkmated* loses the game.
- When one player moves a pawn two squares forward to try to avoid capture by the opponent's pawn, an **En Passant** is in play. The capture will then be made exactly as if the player had moved the pawn square forward. A sample is shown in **Figure 4** below.

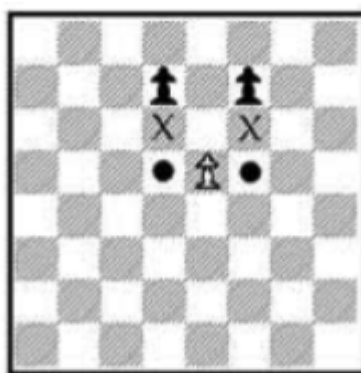


Figure 4

If either of the black pawns move up 2 spaces, the white pawn can perform an *en passant* and move the X on the side of the moved black pawn

1.2 Chess Pieces

Piece Name	Symbol	Quantity (Per Side/Player)	Rule
King	K	1	Can move in any direction, but only one step.
Queen	Q	1	Can move in any direction across the board
Rook	R	2	Can move horizontally and vertically across the board
Bishop	B	2	Can move diagonally across the board
Knight	N	2	Moves in an “L” shape (two squares vertically or horizontally and then 1 square tangent)
Pawn	P	8	Moves only forward vertically one step. If it’s the first move for that Pawn, it can move two steps. Can also perform En Passant (Check the glossary for more details)

2.0 Computer Chess

2.1 Usage Scenario



Figure 5

Start screen with 2 game modes and color selection

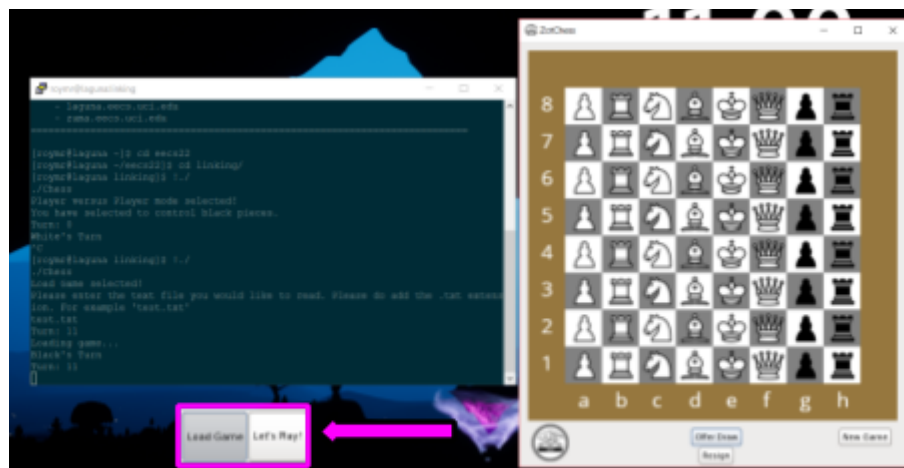


Figure 6

The Load Game Button is used in conjunction with the terminal, you have to type in the name of the text file to load the game

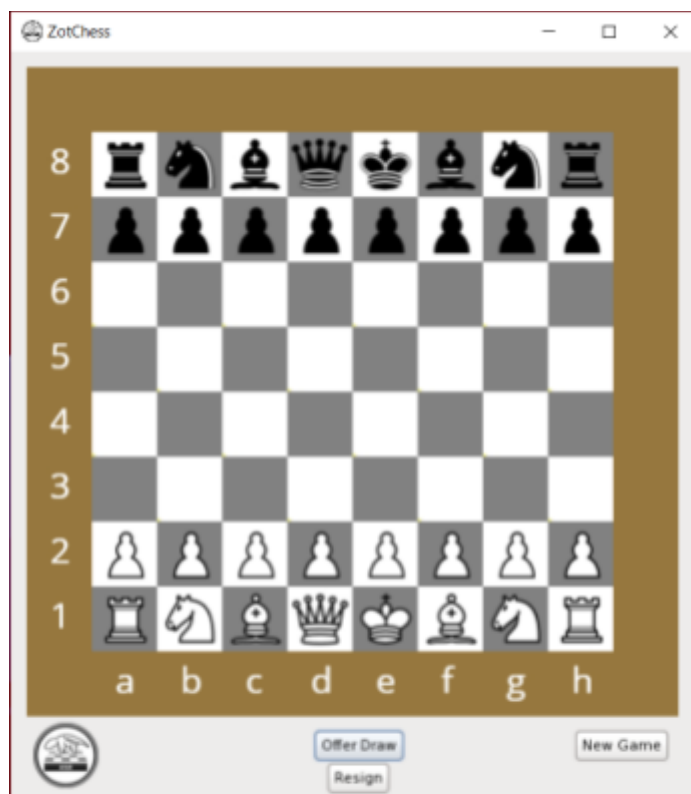


Figure 7

GUI interface that presents the features



Figure 8

This is the post game pop-up, indicating that Black player has won

2.2 Goals

The goal of this software is to create a functional chess game that runs off of linux system. The game should offer a total of 2 game modes: a game mode for two people to play against each other and another game mode for a user to play against bots. For the Player vs Player mode of the game, it should allow users to play against each other and utilize the timer function for designated purposes. For the Player vs Bots game mode, the player should be able to play against bots with adjustable difficulty.

2.3 Features

- A Player vs Player game mode
- A Player vs A.I. game mode
- A graphic user interface for the end user to operate
- A sign to signify whether a player is checked or checkmated
- A button to offer forfeit for both players
- A button to offer draw for both players

3.0 Installation

3.1 System Requirements

Minimum Requirements:

- CPU: Intel Core i3-3210 3.2 GHz / AMD A8-7690 APU 3.1 GHz or equivalent
- RAM: 4GB
- GPU: Nvidia GeForce 700 Series or AMD Radeon Rx 200 Series with OpenGL 4.5
- Storage: 4GB HDD
- OS: GNU/Linux 32-bit

Recommended Requirements:

- CPU: Intel Core i7-8700 3.2 GHz
- RAM: 16GB DDR4-2666
- GPU: Nvidia GeForce RTX 2080
- Storage: 480GB M.2 SSD, 2TB HDD
- OS: GNU/Linux 64-bit

3.2 Setup and Configuration

To launch the application:

- Download the tar.gz file
- Untar the tar.gz file using an untar application (preferably WinZip for Windows)

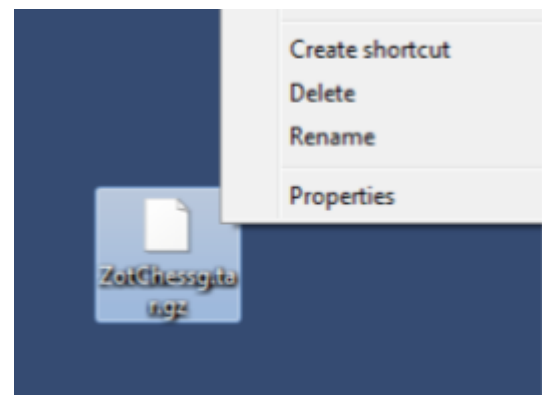


Figure 9

This is the downloaded tar.gz file

- Launch the application

3.3 Uninstalling

To uninstall the application:

- Close the application window
- Delete the tar.gz file
- If necessary, delete the folder where the contents of the tar.gz file were unpacked

4.0 Chess Program Functions and Features



Figure 9

This is how the game will look like once you have selected your game mode

4.1 Basic GUI

ZotChess features a fully functional graphical user interface (GUI) that allows the user to interact with the chessboard by clicking on which piece will be moved and the tile where the piece would be moved.

4.2 Load Game

ZotChess also presents a load game option, where the user can load a current state of the game to resume playing.



Figure 10

The Load Game Button prompts the user to type in a .txt file and loads the board to its respective file contents



Figure 11

When a King is in Check, "check" appears in the top right corner of the board. In this case, White King is being checked by Black Queen

4.3 Check Notification

Another neat addition to the feasibility of ZotChess is the Check Notification. If one of the kings is being checked, the exclamation symbol turns red. Once the king is at a safe position on the board, the notification would then be turned off which is indicated by the gray symbol.

4.4 New Game

ZotChess' new game button creates a new game of chess. The pieces and board will be put to the starting format. After pressing the new game button, a menu will prompt the user if they would want to play against another player or A.I. This way, the user will have no trouble with quickly exiting out of the current game and create a new one.



Figure 12

By pressing on the new game, a menu prompts the user to select the game mode again

4.5 PVP

By selecting the Player versus Player game mode, 2 players will be able to play a game of chess. Each player will be able to move a piece every turn, and alternating turns every time. A line of text will appear at the top of the window to indicate a certain player's turn.

4.6 Player VS AI

By selecting the Player versus AI game mode, a player will then pick a side, through a pop-up display menu that indicates White or Black. After selecting such color, the board will load, and the user can select a piece and select a spot to move, if it is their turn.

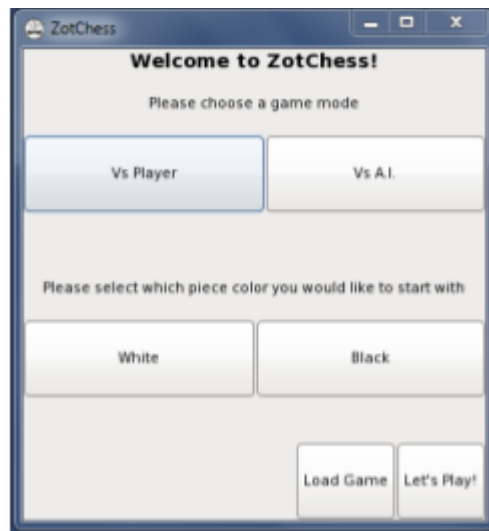


Figure 13

2 Game modes: PVP or Player VS AI



Figure 14

The resign and offer draw button allows the user to forfeit the match or offer a draw to the other human player

4.7 Forfeit

Once the Resign button is pressed, the user forfeits the game. Similar to the Resign button, the Offer Draw button submits a request for the opposing human player to a draw. The other player can either reject or accept the offer. These buttons will only be present in the case of PVP, rather than versus an AI.

4.8 End User

After the intense game of chess, an end screen appears, asking whether or not the user would like to play another game. If yes, a menu appears to ask the user if they would like to play a PVP or a Player VS AI, and follows the procedures afterwards. If the user selects no, then the program quits.



Figure 15

End User Screen reveals the winner

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University of California, Irvine
 The Henry Samueli School of Engineering
 EECS 22L - SOFTWARE ENGINEERING PROJECT IN C LANGUAGE

E4130 Engineering Gateway, Irvine, CA 92697
 +1 (949) 824-5333

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6.0 Error Messages

In case of any error messages, please reference the table below for common error messages.

If your error message is not listed below, please contact the developer. The developer's information regarding phone number, address, and email is at the bottom of the page.

Error Message	How To Fix
Invalid Move	You made an illegal move, please try again.
Any error message shows while installing the game. The following tips can fix most of the errors.	<ol style="list-style-type: none"> 1. Restart your computer. 2. Reinstall the game. 3. Clean the download cache. 4. Put the game's file folder into white list. 5. Contact with developers for further help.
Core dumped	Please contact the developer.
Other Error Messages	Please contact the developer.

University of California, Irvine
 The Henry Samueli School of Engineering
 EECS 22L - SOFTWARE ENGINEERING PROJECT IN C LANGUAGE

E4130 Engineering Gateway, Irvine, CA 92697
 +1 (949) 824-5333

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