Chess V. 1.0
User Manual

Developed by Team 7: The Domerangs

AI/Strategy: Mark Anthony Leyva
AI/Data Structures: Daniel Marcos Mendoza
Ruleset API: Daniel Jimenez
Main Program & Game Logging: Brandon Ngo
User Interface: Aaron Catarroja

Table of Contents

1 ..... Glossary
2 ..... Usage Scenario
3 ..... Goals
4 ..... Features
5 ..... System Requirements
6 ..... Setup and Configuration
7 ..... Uninstalling
8 ...Chess Program Functions and Features
9 ..... Copyright
10 ..... Error Messages
11 ..... Index

Glossary

Check

- A check is when the king is threatened to be taken by another opposing piece. Any enemy piece can place the king in check except the opposing king. A check will force the player's king who is in check to either move their king or capture the piece that places the king in check. If neither options are available, then that is called checkmate and the player who places the an opponent in checkmate wins the game.

Stalemate

- Stalemate is when the game ends with the turn player not being able to make a legal move. This results in draw. Common ways of ending a game in a stalemate is when both players have only a king and a knight or bishop remaining. This is because neither side can possibly place the other player into checkmate.

Castle

- When the horizontal spaces between a rook and king are empty, and neither the king nor the castling rook have moved, the king will move one space in the direction of the rook and the rook will then take that position of the king and the king moves over one more space in the same direction that it had moved.

En passant

- When the pawn moves two spaces on its initial move only, and an enemy piece is horizontally next to it, the pawn will move diagonally so that it is behind the piece and will capture that piece in the process.

Chess pieces and their assorted movements:

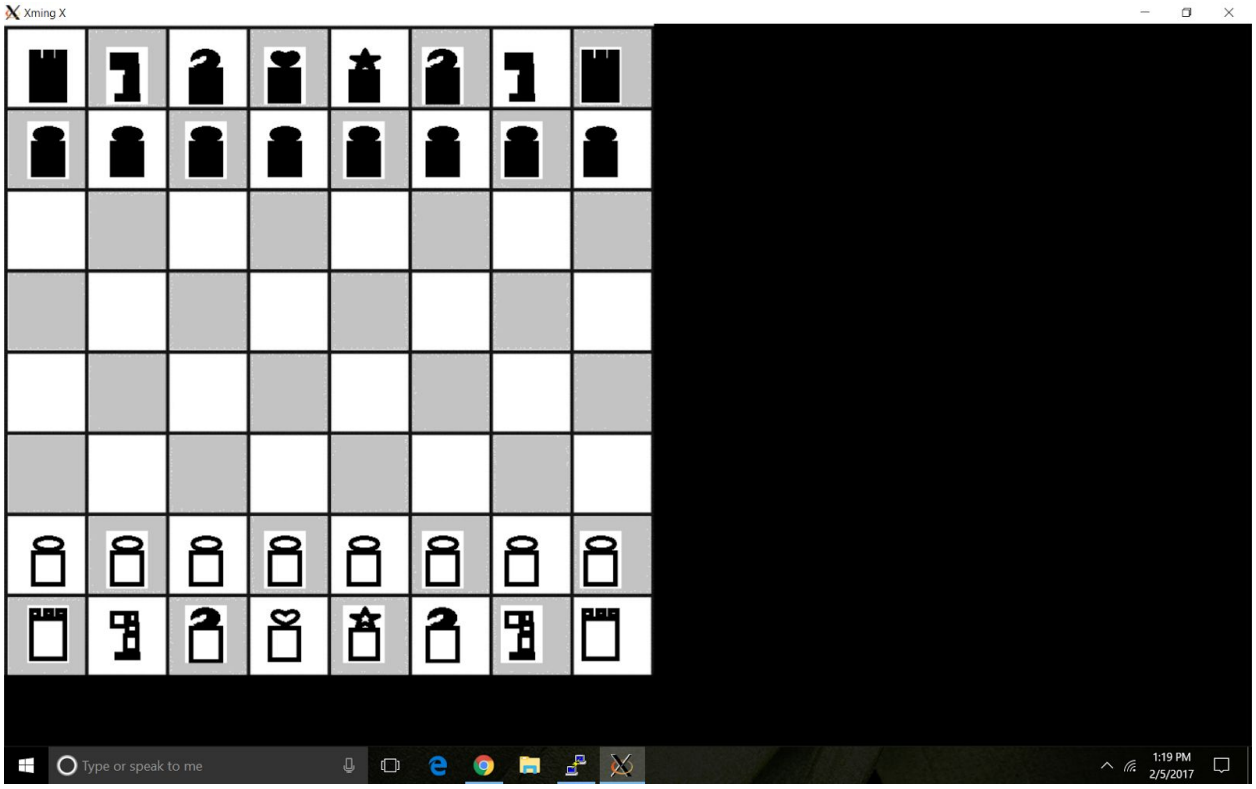
- Queen: Can move horizontally, vertically, and diagonally across the board
- Rook: Can move horizontally and vertically across the board
- Bishop: Can move diagonally across the board
- Knight: Moves two step forward, one step from sideways; can be thought to move in an 'L' shaped format
- King: Can move in any direction but only one space at a time; can never move into a check (See Errors for more details)
- A Pawn: Can only move forward one space at a time but captures pieces sideways. If starting off the game, a pawn may move forward two spaces, otherwise this piece may move only one space at a time.

Usage Scenarios

A typical usage scenario would have the user running the chess program with or without startup options (see Chess Programs Functions and Features). From there the user would be greeted with a terminal output and will choose which color they would like to be and what difficulty should the AI be set at. The user will be able to choose their opponent type as well. The user will then be asked to load a previous game or if to start a new game. If a previous game is selected, `chess` will load the board as it was in its previous run. Else, the user is asked if they would like to setup the board beforehand.

1: Player v Player
2: Player v AI
3: AI v AI
4: Quit
5: Rules

Once the game is set up and running, the user will be asked to input moves by entering the coordinates of the piece to its destination. (refer to Glossary for more information) and be presented with a board with all the current pieces and their locations. The text will indicate whether the move was illegal.



Goals

The goal of this project is to create a chess program capable of having the user start games with different opponents: CPU v CPU, CPU v user, user v user. Differing levels of difficulty: easy, medium, and hard. The goal of the chess game is to capture the opposing king.

Features

- 8x8 board with row (numbered) and columns (numbered)
- Click based input for moves in chess notation
- Choose a side
- Choose opponent type
- Choose opponent difficulty(computer only)
- Each player takes their one move and the turn passes on to the other player

System Requirements

A 64 bit Linux installation along with libc and libm for basic usage.

Installation and Configuration Setup

To install the program, merely download the `tar.gz` file and extract it to anywhere you'd like using the commands `gtar xvzf chessbinary.tar.gz` . To read the manual, merely run the following command: `evince chess/doc/chessmanual.pdf` . Otherwise to start playing right away run the following command: `chess/bin/chess` .

Uninstalling

Uninstalling the application is as easy as deleting the root `chess` folder.

Chess Program Functions and Features

Startup options: These are options you pass to the chess program when running it.

`--setup=`*`path/to/log.txt`*:
This option allows you to load a given board setup from a text file which can then let you Play from that setup.

`--log-output=`*`path/to/log.txt`*:
This option allows you to dictate where to store the game's log file for a given run. If this Is not given at startup, the default location `chess/logs/` will be used.

Assorted functions and Features:

Undo

- The user will click the undo button to perform an undo action. Undo will retract a move at the user's input. It will go exactly one move previous to the current game. It will have a limit of 5 moves.

Legal

- An illegal move will show an error message and should prevent the move from being executed, otherwise the player is disqualified and the game will end for making an illegal move.

Log

- The program will keep track of all moves. The purpose of logging every move is for game analysis and it makes it simpler to undo a move for the program by moving back one frame of the game. After each move, the coordinates of the moved piece will be recorded.

Graphic user interface(GUI)

- The GUI used for the program is SDL. The program will have a test based user input. The interface will be straightforward. The user will enter the numbers to change the modes of play, and then press enter to start the game. Every time the program starts a new game, the GUI will reset to the default functions. The chess board screen will consist of a fully set chess board. Upon clicking the surrender button, it will prompt the user with a confirmation and they must click yes to terminate that game. The chess computer will provided hints. The hints will depend on the AI of the computer. The undo button will be stated in the command prompt

Copyright

©2017 Team Doomerangs™. All rights reserved.

Error Messages

`LOG ERROR: Cannot find specified directory.`

This occurs because the program cannot find the specified directory. If you run the program with `--log-output`, make sure the directory input is correct otherwise the program will not store the log at your given location and store it in the default location.

`LOG ERROR: Cannot write to file.`

`LOG ERROR: Cannot load log file.`

This usually occurs because the logfile does not exist. Please make sure the logfile loaded exists in the appropriate directory.

`LOG ERROR: Cannot setup board to specified logfile.`

This occurs when the the logfile is not properly formatted. If you have edited the logfile after the program has saved it, please make sure to return it to its original formatting. The program needs it in a certain style for it to setup the board.

`CANNOT UNDO MORE THAN 5 MOVES`

There is a limit to how many moves the `undo` command can undo. The maximum limit is 5.

`ILLEGAL MOVE: King will be in check.`

This occurs if you try to make a move with your King and the space he it is moving to is in check by another piece. An example of this is when you try *Castling*. If the space where your king will be moved is in check by an opponent's piece (for example a Rook), then the move cannot be completed.

`ILLEGAL MOVE: King is in check.`

This occurs if you try to move one of your pieces but your King is in check. Move your King out of check first before moving your other pieces.

Index

C
Castle 3
Check 3
Chess Program Functions and Features 6
Copyright 7

D
Domerangs 1

E
En passant 3
Error Messages 8

F
Features 5

G
Glossary 3
Goals 5
Graphic user interface(GUI) 7

I
ILLEGAL MOVE 8
Installation and Configuration Setup 6

L
Legal 6
Log 7
LOG ERROR 8

R
Runtime options 6

S

Stalemate 3
Startup options 6
System Requirements 6

T
Timer 7

U
Undo 6
Uninstalling 6
Usage Scenarios 3