Chess-Bot v.0.1

6 piece FireTurtles
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Image was found at https://en.wikipedia.org/wiki/Chessboard

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Glossary

1. Bishop: A bishop is capable of moving any number of squares as long as its path is not blocked, but only in a diagonal direction.

2. Capture: When one piece "captures" another piece, the piece that is captured is taken from the chessboard and is taken out for the rest of the game. In order to "capture" a piece, most pieces simply need to move to the square that contains the opposing piece. The opposing piece, hence, is then captured. Only one piece can be captured per turn.

3. Castling: Castling is a tactic that can only be done by each player ONCE per game. In order to castle, a player must use their king piece and one of their two rook pieces. Additionally, both pieces must have not been moved yet AND no other pieces must be between the king piece and rook piece that are being used to castle. To castle, a player moves their king piece two squares TOWARD the rook that the player is using to castle. After this, the rook piece that is being used to castle is then moved to the square that is next to the king and closest to the center of the chessboard. Note that a player cannot castle so that their king piece either passes through, moves into, or moves out of a check.

4. Check: Refers to a scenario when the king piece is currently under threat of being captured by another piece.

5. Check-mate: When a king piece is incapable of getting out of a "check" status (please refer the term "check" in glossary). Forcing one player's king piece into a checkmate is the only way to win a game.

6. Chessboard: The chessboard is the eight square by eight square playing field that players play chess on. The "Chess-Bot" program's playing field comes included with a coordinate system to help players know the position of their pieces (Please see section 3.3 User Interface for more information on the "Chess-Bot" program's chessboard).

7. Chess Piece: This term refers to one of the thirty two movable pieces that are used to play the game of chess. All pieces come in only one of two colors; white or black.

8. En Passant: A term derived from the French term that means "in passing". An En Passant in chess refers to a special type of capture. When a pawn piece moves two squares on its first move (please refer to the term "Pawn" in the glossary), the opponent is able to use an "En Passant" capture in order to capture said pawn piece as if it had only moved only square. However, if an "En Passant" capture is not able to used IMMEDIATELY after a pawn moves two squares, that pawn piece is immune to an "En Passant" capture for the rest of the game.

9. King: The King chess piece is capable of moving in any direction by one square at a time. If a player's King piece is forced into a checkmate, that player loses the game and the other player wins. Note that a king piece cannot be intentionally put into a check or checkmate. Additionally, a king piece cannot be captured.

10. Knight: A knight is a chess piece capable of moving in an L-fashion; it moves two squares horizontally or vertically, and then it makes a right angle turn to move one more square. The knight is the only piece capable of moving OVER other pieces as long as its target destination square is not blocked. However, a knight piece can only capture pieces that are on the target destination squares of their legal movements.

11. Pawn: The pawn chess piece is only capable of moving forward toward the opposing side, one square at a time. The pawn can only capture opposing pieces that are diagonal and in front of it (note that the opposing piece must be only one diagonal square away as well). If a pawn has not been moved yet, only on its first turn can it can move two spaces instead of one, but ONLY forward. If a pawn manages to reach the end of the board on the opponent's side, a pawn MUST be promoted to any other piece such as a rook, bishop, knight, etc. However, a pawn can never be promoted to a king.

12. Promotion: When a pawn piece manages to reach the end of the board on the opposing side, that pawn MUST be changed into another piece such as a rook, bishop, knight, etc. However, a pawn can never be changed into a king.

13. Queen: The queen chess piece is capable of moving any number of squares as she wants as long as it is in a straight path as long as her path is not blocked.

14. Rook: A rook chess piece is capable of moving any number of squares as long as its path is not blocked, but only horizontally or vertically.

15. Square: The term "square" is used to describe any of the sixty-four spaces that make up the chessboard. A piece can only occupy one square at a time.

1. Computer Chess

1.1 Usage Scenario

This image illustrates what a typical chess game looks like while running the "Chess-Bot" program.

```
Welcome to Chessbot! Type z9 while playing to quit
Choose a side 1:White  2:Black  :1
       |      |      |      |      |      |      |      |
1   aR   |  aH   |  aB   |   aQ   |  aK   |  aB   |  aH   |  aR
    -------------------------------------------------------------------
       |      |      |      |      |      |      |      |
2   aP   |  aP   |  aP   |   aP   |  aP   |  aP   |  aP   |  aP
    -------------------------------------------------------------------
       |      |      |      |      |      |      |      |
3        |      |      |      |      |      |      |
    -------------------------------------------------------------------
       |      |      |      |      |      |      |      |
4        |      |      |      |      |      |      |
    -------------------------------------------------------------------
       |      |      |      |      |      |      |      |
5        |      |      |      |      |      |      |
    -------------------------------------------------------------------
       |      |      |      |      |      |      |      |
6        |      |      |      |      |      |      |
    -------------------------------------------------------------------
       |      |      |      |      |      |      |      |
7   pP   |  pP   |  pP   |   pP   |  pP   |  pP   |  pP   |  pP
    -------------------------------------------------------------------
       |      |      |      |      |      |      |      |
8   pR   |  pH   |  pB   |   pQ   |  pK   |  pB   |  pH   |  pR
    A    |  B    |  C    |   D    |  E    |  F    |  G    |  H


Player Type in location of the piece you want to move (use lowercase letters)
a7
```

1.2 Goals

The goal of ChessBot is the same as that of regular chess; for you to beat your opponent by forcing him/her into a checkmate scenario.

Please note that only the universally standard rules of chess apply to this game; only rules that are used in EVERY standard chess game, competition, or etc. are applied to this game.

1.3 Features
1. The ability to choose the color of the pieces you want to use (black or white).
2. An artificial intelligence chess opponent.
3. A User Interface(UI) for players to input their moves as well as to see past ones.
4. A log of all moves made throughout a game.
5. A chess game that follows all the standard rules of chess

2. Installation

2.1 System Requirements:

- Linux environment kernel number 2.6.32-696.18.7.el6.x86_64 Release 6.9

- 2 GiB RAM

- 2 GHz dual core processor

- 4.5 GB of hard-drive space

- Either a DVD drive or a USB port for the installer media

- Internet

2.2 System Setup and Configuration

In order to setup the Chess Game, go through the following steps:
 (An example is shown below)

Step 1: Download the application into the target destination using the command tar -xvzf (targetdirectory)/Chess_Alpha.tar.gz.

Step 2: Go to the bin directory with "cd bin".

Step 3: Now just type ". /Chess" (Exclude quotation marks) and the application will start running

Step 4: Begin Playing. In order to understand how to begin playing a game on the "Chess-Bot" program as well as access its other features, please refer to all of section 3. Chess Programs Functions and Features.

```
[sbkam@bondi ~/test4]$ tar -zxvf ../project/chess/chkout/Chess_V1.0.tar.gz
./doc/README
./doc/COPYRIGHT
./bin/Chess
./doc/Chess_UserManual.pdf
./doc/INSTALL
./Makefile
[sbkam@bondi ~/test4]$ make
make: *** No rule to make target `src/Main.c', needed by `Main.o'.  Stop.
[sbkam@bondi ~/test4]$ ls
bin  doc  Makefile
[sbkam@bondi ~/test4]$ vi Makefile
[sbkam@bondi ~/test4]$ make Chess
make: *** No rule to make target `src/Main.c', needed by `Main.o'.  Stop.
[sbkam@bondi ~/test4]$ vi Makefile
[sbkam@bondi ~/test4]$ ls
bin  doc  Makefile
[sbkam@bondi ~/test4]$ cd bin
[sbkam@bondi bin]$ ls
Chess
[sbkam@bondi bin]$ ./Chess
Welcome to Chessbot! Type z9 while playing to quit
Choose a side 1:White  2:Black  :
```

2.3 Uninstalling

Step 1: First make sure you are in the same file as the Chess Game

Step 2: Then type "make clean"

Step 3: Then exit the folder you are in and then delete the folder

```
[sbkam@bondi ~/test3]$ make clean
rm ./bin/Chess
rm ./bin/*.o
[sbkam@bondi ~/test3]$ ls
bin  doc  Makefile  src
[sbkam@bondi ~/test3]$ cd bin
[sbkam@bondi bin]$ ls
CVS
[sbkam@bondi bin]$ 
```

3. Chess Program Functions and Features

3.1 Pick Color

- User decides if they want to start with the Black or White pieces. The player that has the White pieces goes first.

3.2 Artificial Intelligence (AI)

- Makes a move in less than a minute: "Chess-Bot" knows not to keep people waiting; the "Chess-Bot" AI it is guaranteed to determine and make a move within less than a minute after its turn has started. Additionally, the "Chess-Bot" AI is capable of following the standard rules of chess.

3.3 User Interface (UI)

- Chessboard: While playing a game, the "Chess-Bot" program features a full standard eight-by-eight chess board for users to play on. This comes included with coordinates on both axes of the board.
- Pieces: No chess game would be complete without the chess pieces, and the "Chess-Bot" program is no exception. The "Chess-Bot" program comes included

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with all thirty-two chess pieces seen in a standard chess set. Each player starts a game with 8 pawns, 2 rooks, 2 knights, 2 bishops, 1 queen, and 1 king.

- ● Precise Coordinate System Controls: While playing a game on the "Chess-Bot" program, users will see two prompts appear while playing; first a prompt to select the piece the user would like to move by entering in the coordinates of that piece, and then a prompt asking the user what coordinates the user would like to move that piece to. Please note that all coordinates must be entered in the form of a number. For instance, coordinate 5-5 should be entered as "55". An example of this can be seen in the image on the User Scenario section in 1.1. To help with this, the chessboard on the UI comes included with a coordinate system, with letters for the horizontal axis, and numbers for the vertical axis.

3.4 Log of Moves

　　　While playing a game on the "Chess-Bot" program, all moves will always be printed after each turn to help users keep track of past moves made by both the "Chess-Bot" AI and the user.

4. Copyright

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5. Error Messages

"Illegal move" is displayed when player makes illegal moves, i.e. moving a pawn backwards.

"Out of memory" is displayed when Linux machine is out of memory for program to operate.

"Out of bounds" is displayed when a move is made that doesn't exist on the board ie. Rook A9, etc

"Time Out" is displayed when player does not make move for over 10 minutes or run out of playtime.

"Not valid color" is displayed when player input a color that is not supported.

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