War and Pieces

A Chess program brought to you by the Knights of the Square Table

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Foreword
The Knights of the Square Table are pleased to present a simple, easy-to-use chess program, complete with AI for player versus computer gameplay. The program is designed for anyone who has a basic understanding of the rules of chess. We hope to provide many hours of practice and play for your enjoyment and improvement as a chess player. Have fun!

-Erik Yoder and Stefan Mellem

The Game Window
The main interface for the program is the “Game Window,” which encompasses everything excluding the title bar and menus for the program. Its contents are described below.

The Board:

This is what you should see in the game window when you first run the program, or start a new game. By default, the board is set to the standard beginning position with the player using the white pieces against the hard AI. Each rank (row) and file (column) is labeled by a number or letter, respectively, which can be used to refer to any square on the board.

Playing the Game:
To start playing the game, all you have to do is click on one of your pieces to select it, then click on another square to move it to. Notice that when you select a piece by clicking on it, the program will highlight the selected piece in yellow and the legal spaces for it to move into in light blue:
To execute a move to a legal square, simply click on the square while a piece is selected (see above left). After moving a piece, the computer will make a move. Clicking on an illegal square or clicking off the playing surface simply deselects the currently selected piece.

There are two other types of color accents that can be displayed on the board. The first occurs when a piece you select has the opportunity to make a capture. While legal moves to open squares are highlighted with light blue, legal captures are highlighted with light red, as shown at right.

Captured pieces are removed from the board and displayed on the left (for the bottom player) or right (for the top player) side of the playing area. In this picture, only a white pawn has been captured.

The last accent is displayed when a player is checked or checkmated, where the checked king is highlighted with a dark red. In the picture below and to the left, the computer has just moved its bishop to check the white king, and the player has not yet made a move. Below and to the right, the computer has checkmated the player, where the king is again highlighted with dark red. At this point the game is over and pieces can no longer be moved. To start a new game, use the New Game Menu Button (see New Game) or the Ctrl+N keyboard shortcut (see Keyboard Shortcuts).
The Menu Buttons
The Menu Buttons, across the top left corner of the window, provide various helpful tools. They consist of options for New Game, History, Flip Board, and Undo. The following sections explain their uses.

New Game:
The New Game button is how you can begin a new game and choose the settings for that game, including player color and AI difficulty level. By clicking the button, a new window will open, at the top of which displays the question “Which color would you like to play as?” with checkbox options of “White” or “Black.” Below that is the question “Which AI difficulty would you like to play against?” with the options of “Easy” “Medium” or “Hard.” After selecting desirable options, clicking the Start Game button at the bottom of the New Game window will launch the new game with the conditions the user chose.
**History:**
The second Menu Button is the History button. Clicking this will print to the terminal a list of the moves that have been played so far in the current game. The list will use standard algebraic notation for chess, an example of which is shown at right.

In algebraic notation, each piece is represented by a different letter. We use K for the king, Q for the queen, R for the rook, B for the bishop, N for the knight, and P for the pawn. Each move is notated by the name of the piece being moved, followed by the name of the square to which it is being moved. For example, moving a knight to d3 (the fourth column, third row from white’s perspective) would be notated as Nd3. A capture is notated with an ‘x’ between the piece name and the square at which the capture occurs. If an opposing piece occupied d3 in the above example, the notation would be Nxd3. If two different knights could capture the same square, we would specify which by the file it occupies (Nxexd3). If this, too, fails to disambiguate two moves, then we specify the rank, or even the entire position of the capturing piece (N5xd3 or Ne5xd3).

For pawn moves, the leading ‘P’ is usually left off, except in cases where this would cause ambiguity. As such, an opening move of pawn to d4 would be notated ‘d4’ instead of ‘Pd4.’

A checking move is notated with a ‘+’ appended to the end of the move notation, and a checkmating move uses a ‘#’ (e.g. Qf8+ or Qf8#). At the completion of the game, the terminal will print out the winning color.

**Flip Board:**
The flip board button rotates the orientation of the board by 180°. This can be used at any time during any game type, however it may seem especially useful if the user chooses to play as black, or wishes to temporarily view the board from the AI’s perspective.
**Undo:**
The undo button undoes the last turn of the game, resetting the game board to the game’s state immediately before the last move made by the user. There is no limit to the amount of moves that can consecutively be undone.

**Keyboard Shortcuts:**
Each Menu Button also has a keyboard shortcut, which is displayed on the right hand side of the button. The keyboard shortcuts are as following: New Game is “Ctrl+N”, History is “Ctrl+H”, Flip Board is “Ctrl+F”, and Undo is “Ctrl+Z.”

**A Note on the Rules:**
If you are unfamiliar with the rules of chess, the Wikipedia page on “Rules of Chess” has an excellent explanation.