

# The Most Epicest Chess Game 3000

User Manual

Version 1.0.0

EECS 22L

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# GLOSSARY

**Pieces** - The figures used to move around the board and play the game.

**Pawn** - The simplest piece in chess, can move forward one space only, unless it is the first time, in which it can move either one or two spaces forward.

**Rook** - Piece in chess that can move either horizontally or vertically as many spaces as it wants.

**Bishop** - A piece that can move in any diagonal direction as far as it wants.

**Knight** - A piece that moves in an 'L' shaped direction.

**Queen** - A piece that can move forward, backward, left, right, or diagonally as many spaces as it wants.

**King** - A piece that can move in any open space around it. If it is checkmated, the game is over.

**En passant** - A special move in chess in which a pawn captures a horizontally adjacent enemy pawn that has just advanced two squares in one move

**Castling** - A special move that can be performed once per player where if neither the King nor the Rook has previously moved and there are no pieces between them, the King is moved two squares towards the Rook while the Rook is moved to the square that the King crossed.

**Capture** - Also known as 'Eating', a piece is moved onto the same space as an opposing piece, resulting in that piece being removed from the game.

**Check** - A player's King is in a position where it will be captured in the next turn and can be moved out of such a position of being captured.

**Checkmate** - A player's King is in a position where it will be captured next turn, and it has no options to escape being captured.

**Promotion** - A pawn reaches the opposite of the board and can change into any piece except a pawn or king.

# 1 | COMPUTER CHESS

## 1.1 Usage scenario

This is an example of how the program worked:

### Main Menu

After installing the chess game, the main menu of the game will show up like the figure below

```
*****
The Most Epicest Chess Game
Made By: Team TBD
*****
1. Play  2. Settings  3. Exit
Your choice: 1
```

### Play Menu

If option 1 was selected from the Main menu, the Play menu will show up like the figure below.

```
Your choice: 1

Please choose one of the following option below:
1. Player vs Player    2. Player vs AI    3. Go Back
```

If option 1 was selected from the Play menu, the game will immediately start with the Player vs Player mode and the chessboard will be generated, and the first player to move will be White by default.

```
Your choice: 1
You chose to play --Player vs Player mode--

  A      B      C      D      E      F      G      H
8  eeeeeee | \   / |  e  | % \ / % | ++  |  e  | / \   | eeeeeee |
  @+++++@ |  \ /  |  @b@ | @ @ @ | @+ +@ |  @b@ | / \   | @+++++@ |
  e rB e   |  = \  |  @b@ | @ @ @ | @ @ @ |  @b@ |  = \  | e rB e   |
  @+++++@ |  [ ]  |  @b@ | @ @ @ | @ @ @ |  @b@ |  [ ]  | @+++++@ |
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1  eeeeeee | \   / |  e  | % \ / % | ++  |  e  | / \   | eeeeeee |
  @+++++@ |  \ /  |  @b@ | @ @ @ | @+ +@ |  @b@ |  \ /  | @+++++@ |
  e rW e   |  = \  |  @b@ | @ @ @ | @ @ @ |  @b@ |  = \  | e rW e   |
  @+++++@ |  [ ]  |  @b@ | @ @ @ | @ @ @ |  @b@ |  [ ]  | @+++++@ |
  @+++++@ |  [ ]  |  @b@ | @ @ @ | @ @ @ |  @b@ |  [ ]  | @+++++@ |
  A      B      C      D      E      F      G      H

White's turn!
Input move
Format (e2e4)
```

If option 2 was selected from the Play menu, the game will immediately start with the Player vs AI mode and the chessboard will be generated, and the first player to move will be White by default.

```

Your choice: 2
You chose to play --Player vs AI mode--

  A      B      C      D      E      F      G      H
8  +-----+ +-----+ +-----+ +-----+ +-----+ +-----+ +-----+ +-----+
   | e e e e e | | \ / \ / | | % \ / \ / | | @+ +@ | | \ / \ / | | e e e e e | | | | | | | |
   | e+++++e | | | kB | | | @B@ | | @ @ @ | | @B@ | | | kB | | | e+++++e |
   | e rB e | | | = \ | | | = e e | | @ KB @ | | | = \ | | | e rB e |
   | e+++++e | | | | | | | % e e e | | % e e e | | | | | | | | e+++++e |
   +-----+ +-----+ +-----+ +-----+ +-----+ +-----+ +-----+ +-----+
7  | e e | | e e | | e e | | e e | | e e | | e e | | e e | | e e |
   | @pB@ | | @pB@ | | @pB@ | | @pB@ | | @pB@ | | @pB@ | | @pB@ | | |
   | e e e e e | | e e e e e | | e e e e e | | e e e e e | | e e e e e |
   | e a | | e a | | e a | | e a | | e a | | e a | | e a | | e a |
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5  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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4  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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3  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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2  | e e | | e e | | e e | | e e | | e e | | e e | | e e | | e e |
   | @pW@ | | @pW@ | | @pW@ | | @pW@ | | @pW@ | | @pW@ | | @pW@ | | |
   | e a | | e a | | e a | | e a | | e a | | e a | | e a | | e a |
   | e e e e e | | e e e e e | | e e e e e | | e e e e e | | e e e e e |
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1  | e e e e e | | \ / \ / | | % \ / \ / | | @+ +@ | | \ / \ / | | e e e e e |
   | e+++++e | | | kW | | | @w@ | | @ @ @ | | @w@ | | | kW | | | e+++++e | |
   | e rW e | | | = \ | | | = e e | | @ KW @ | | | = \ | | | e rW e |
   | e+++++e | | | | | | | % e e e | | % e e e | | | | | | | | e+++++e |
   +-----+ +-----+ +-----+ +-----+ +-----+ +-----+ +-----+ +-----+
  A      B      C      D      E      F      G      H

White's turn!
Input move
Format (e2e4)

```

If option 3 was selected from the Play menu, the player will go back to the Main menu

```

Your choice: 3

*****
The Most Epicest Chess Game
Made By: Team TBD
*****
1. Play  2. Settings  3. Exit
Your choice: █

```

## Settings Menu

If option 2 was selected from the main menu, the Settings menu will show up like the figure below

```

Your choice: 2

Please choose one of the following settings to alter:
1. Color  2. Difficulty  3. Go Back

```

If option 1 was selected from the Settings menu, the Color menu will show up like the figure below. The player can pick the color of the piece to play the game.

```
Your choice: 1

Please select a color to play as:
White      Black

Your choice: white

You chose to play as white.
```

## 1.2 Goals

- Implement more advance movements i.e *en passant* and *castling*, *promotion*
- Implement a smart AI
- Option for User vs User, User vs Computer
- Play full game of chess

## 1.3 Features

- Various difficulties
- Choose starting color
- Reset board
- Check move legality

# 2 | INSTALLATION

## 2.1 System requirements

x86-64 bit Linux System

## 2.2 Setup and configuration

Installation for a binary package

```
% tar -xvzf Chess_V1.0.tar.gz
% evince chess/doc/Chess_UserManual.pdf
% chess/bin/chess
```

Installation for a source code package

```
% tar -xvzf Chess_V1.0_src.tar.gz
% evince chess/doc/Chess_SoftwareSpec.pdf
```

```
% cd chess
% make
% make test
% make clean
```

## 2.3 Uninstalling

```
from
cd ..
rm -rf Chess_V1.0
rm -rf Chess_V1.0.tar.gz
```

# 3 | CHESS PROGRAM FUNCTIONS AND FEATURES

## 3.1 Basic Functions

1. The game follows the official rules of chess.
2. The program shows a game interface where the player can see the game board and make moves.
3. The program supports an interactive player (human user) and an automated player (computer).
4. The human user chooses the side to play (white or black).
  - User input a color they want to play
  - Program will print out the color the user want to play
5. The program keeps a human readable log of all the moves (in a text file).
  - User chooses the piece to move and move to the place they want
  - Program will print out the movement like rank, file and the name of the piece
6. The computer player makes its moves in reasonable time (less than 1 minute per move).

## 3.2 Selection of color

- User input
  - User inputs the color that they want to play as.
- Program output
  - Program will print out that the color has changed successfully and reflect that in the gameplay
- Screen shot

```

Please choose one of the following settings to alter:
1. Color      2. Difficulty    3. Go Back

Your choice: 1

Please select a color to play as:
White      Black

Your choice: black

You chose to play as black.

```

### 3.3 Piece Movement

- User input
  - Select the initial position of the piece that you want to move and the final position to where you want to move the piece to. I.e. move white pawn from E2 to E4 type "e2e4"
- Program output
  - Program will print out updated board with piece new, valid location.
- Screen shot:

```

You chose to play --Player vs Player mode--

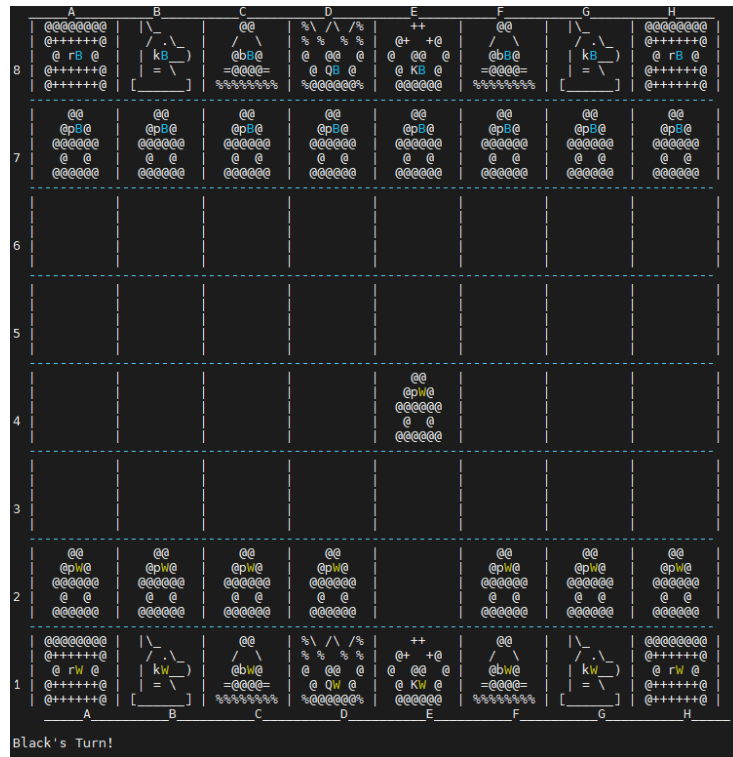
  A      B      C      D      E      F      G      H
8  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~
   @rB@  |  kB  |  @bB@  |  @  @  @  |  @+ +@  |  @bB@  |  @rB@
   ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~
7  @pB@  |  @pB@  |  @pB@  |  @pB@  |  @pB@  |  @pB@  |  @pB@
   ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~
6  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~
5  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~
4  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~
3  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~
2  @pW@  |  @pW@  |  @pW@  |  @pW@  |  @pW@  |  @pW@  |  @pW@
   ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~
1  @rW@  |  kW  |  @bW@  |  @  @  @  |  @+ +@  |  @bW@  |  @rW@
   ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~  ~~~~~
  A      B      C      D      E      F      G      H

White's turn!
Input move
Format (e2e4)

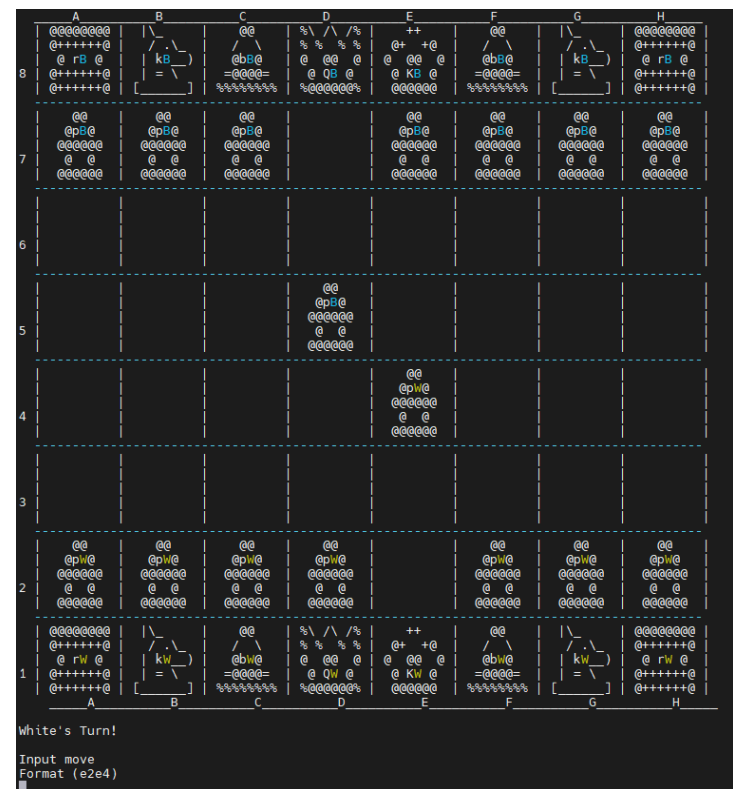
```



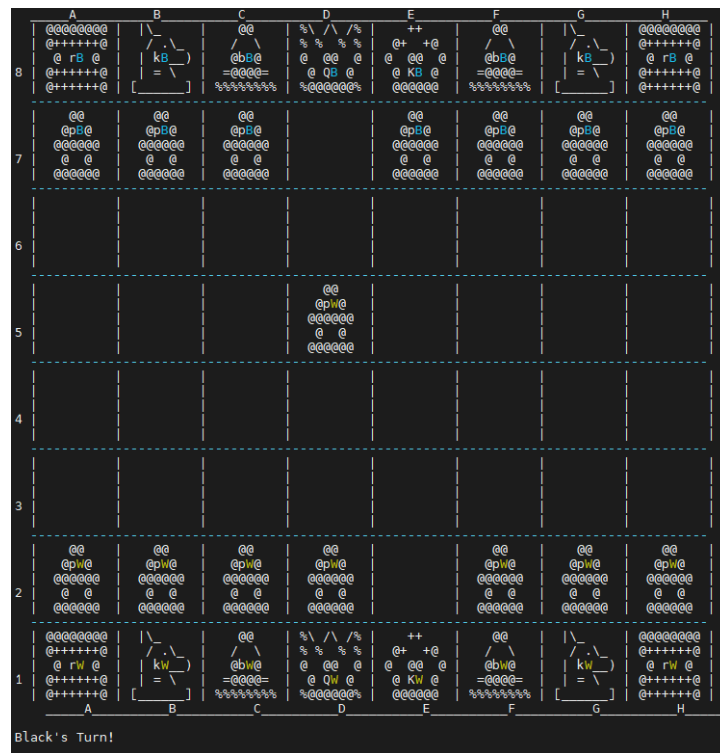
White Pawn moves forward



Black Pawn moves forward



## Pawn capture



## AI move forward



### White Queen promotion

move executed  
 Pawn is able to promote!  
 Please choose a piece to promote to:  
 ROOK KNIGHT BISHOP QUEENQUEEN

Black's Turn!

Input move  
 Format (e2e4)

# Back matter

## Copyright

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## Error messages

- Invalid Input
- Cannot attack own piece
- Segmentation Fault

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