On running the program:

In order to run the program just go into the directory and call ‘python main.py’. Just be sure that you have enum installed. If you don’t, run ‘pip install enum’. Then run ‘python main.py’.

Then follow the instructions on the screen. There is no GUI, so everything is text based. The screen will ask you for which level you would like to play at, and then if you would like to go first or second.

On your turn, the terminal will give you an option of the pieces that you can move, and a number that represents that piece. Enter a number of which piece you would like to move.

Once you entered that piece, the terminal will show you all the possible moves that you can make along with numbers, where each number represents one move. Enter a number of which move you would like to make.

On the program itself:

The game works by using a two dimensional array of the board. Before each turn, all of the pieces on the board are found. Then all of the possible moves from those pieces are found, and either shown to the user or fed to the AI.

On the user’s turn, they pick a piece, and then they are given all the possible moves and they pick a move. That move is then completed, and the board is updated.

On the computer’s turn, the computer loops through all pieces that can be moved and then loops through all the possible moves for each of those pieces. For each of those moves, Alpha-Beta-Search is then called.

The evaluation function works by giving a value to each row and each column on the board. Then, each piece of a given color is passed into the function, and a value is calculated off of each piece. Rows closer to that color’s goal are worth the most, and columns closer to the middle are worth more. Since this calculation is computed for each piece, the more pieces a color has, the higher the output for the evaluation could be.

The layers of difficulty work by telling the AI to search the tree deeper and deeper. On level one, the AI only searches two levels down. Level two is four levels down, and level three is six levels down.