CS 201 Spring 2019 Portfolio Project Proposal

Project Choice: Option 2 – Custom Game – Othello

**Rules and Specifics of the Game**

* The board, traditionally green, is an 8x8 grid.
* There are two players, one with black pieces and one with white pieces.
* The game begins with two pieces of each color diagonal from each other in the center four grid locations, as shown below.

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* The player with black pieces moves first.
* The player with black pieces must place a black piece on the board such that there is a horizontal, vertical, or diagonal line between the new piece and an existing black piece, and there must be one or more contiguous white pieces in between the two black pieces. Legal moves for a black piece are denoted with asterisks below.

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* The moves for a black piece denoted by an asterisk and shown below are not legal because there are no white pieces between the black pieces, or the white pieces are not contiguous.

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* After the black piece is placed, all white pieces in between the two black pieces are “flipped” to white. A before and after example is shown below, with the move and effected piece indicated by asterisks.

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* Now the turn of the player with the black pieces. It is now the turn of the player with the white pieces.
* The player with the white pieces makes move similarly to the black pieces. The player with white pieces must place a white piece on the board such that there is a horizontal, vertical, or diagonal line between the new piece and an existing white piece, and there must be one or more contiguous black pieces in between the two white pieces.
* Players continue making moves back and forth in this way.
* If a player cannot make a move, the player’s turn is skipped.
* If both players cannot make a move, the game is over, regardless of if the board is filled.
* If the board is filled, the game is over.
* Once the game is over, the winner is the player with the most pieces of their color on the board.
* It is possible for there to be equal numbers of black and white pieces at the end of the game. This is considered a tie, and the game is still over.

**Gameplay Strategy**

* Corners are the most desirable location on the board.
  + Once taken, corners cannot be flipped.
  + Pieces of the same color adjacent to corners become stable.
  + Effectiveness of corner can be minimized by taking the squares directly adjacent to corners.
* Having more pieces does not mean a player is winning.
  + In fact, initially the person with the least number of pieces is probably winning.
  + The more pieces you have, the more options your opponent has for moves.
* Edges are the next most important, after corners and the squares around corners.
  + Creeping along edges, however, can be a really bad move if you completely give up the center.
* Be cautious of player in the rows just inside the edge rows, as these could bridge your opponent to the edge or a corner.
* Diagonals are advantageous to control.
* The center is advantageous to control.
* X-squares are diagonally adjacent to a corner.
* C-squares are vertically or horizontally adjacent to a corner.
* Wedging involves playing a piece of one color between two pieces of the opposite color. This piece therefore cannot be flipped.
  + Can be forced anywhere there is an odd number of spaces between two pieces.
* Minimize frontier disks – disks on the edge with adjacent empty squares.
  + This reduces the number of moves your opponent can make.
* White has the advantage of the last move, unless black can force a pass.

**Play-Against-Computer AI**