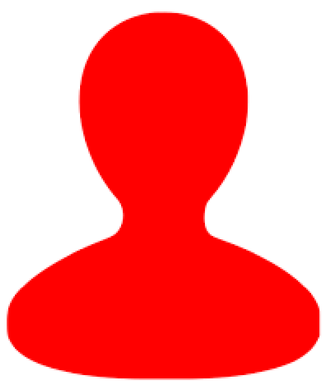
Charlie Checkers

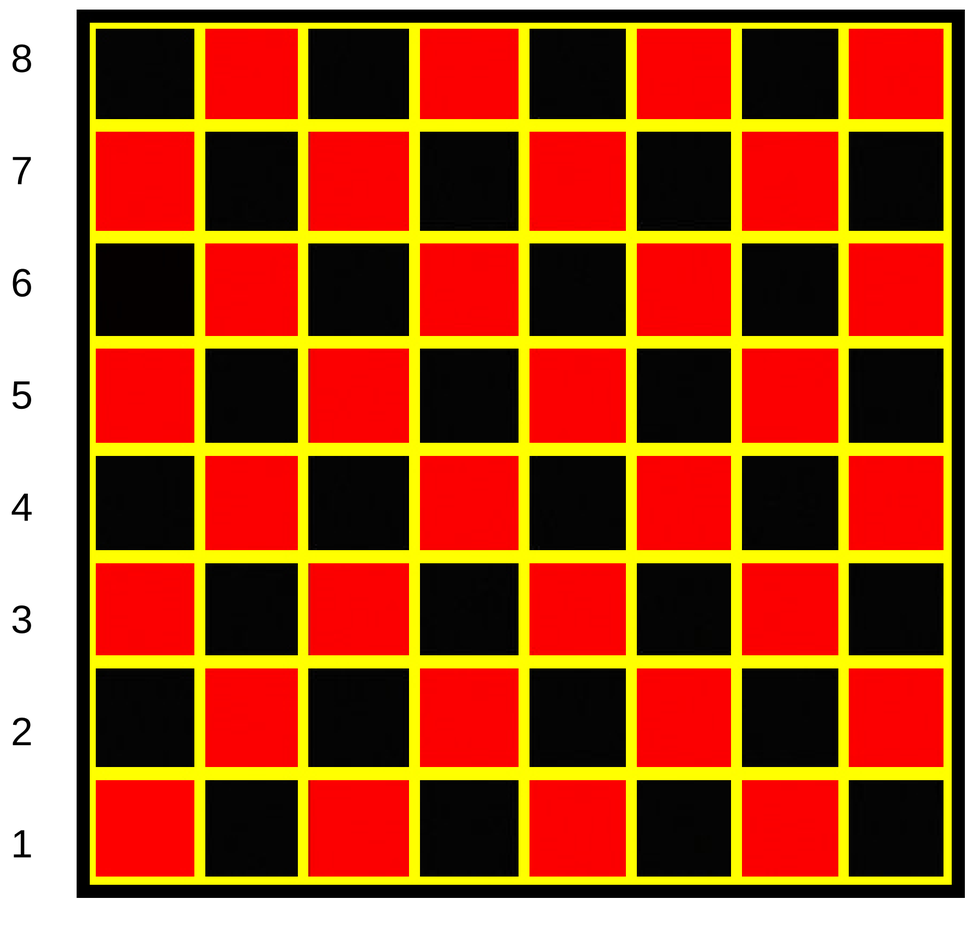
Digital Checkers Champion

Created by Ryder Roedel and Joey Tseng

Design

- Charlie is always playing from top moving down
- Performance Metric
  - Net safe pieces weighted by closeness to being a king.
- Environment
  - Game Board (8 X 8)
  - Pieces
  - Players (Charlie and Humans)
- Actions
  - Not king (+ or – 1, – 1)
  - King (+ or – 1, + or – 1)
- Sensors
  - Functions to interpret current positions of pieces





AI Technique

We will use a solve by search method to determine the best next move for Charlie Checkers. To search we will use min-max algorithm to choose the next move. The algorithm will rate moves based on our heuristic, net safe pieces weighted by closeness to being a king. Closeness to being a king is determined by the row the piece is in where pieces closest to my opponents back row are worth the most. Kings are valued as if they are in my opponents back row regardless of their position. So since Charlie is always playing from the top of the board, a piece on row 8 is worth the least and a piece on row one is worth the most. Our algorithm will initially only consider two levels of moves and a game where double jumps are illegal, and these features will be removed based on time constraints.

Data Structure

Charlie Checkers will hold a two dimensional array of integers to represent the present state of the board. In checkers there are two classes of pieces, standard and kings. Since kings have different move sets, Charlie must both keep track of the location as well as class of pieces on the board. The indexes of the arrays will represent the co-ordinates of each square with values shown in the diagram above. Charlie’s pieces shall be represented as 1 for standard pieces and 2 for kings. The human participant’s pieces shall be represented as 3 for standard pieces and 4 for kings.

User Interface

The game shall redraw the board after every move. The player shall move their chosen piece by entering first the co-ordinates of the piece they wish to move and then the co-ordinates of the position of the result of the move. Moves shall be checked for legality of the move. Charlie shall announce his move in the same format of the humans input along side the redrawn board to reflect the change of state.