AI Homework 4

Members:
- Songxi Chen
- Jim Yang

Four-in-a-row AI with minimax algorithm

Heuristic Implementation

- **Check for win**

We have our board setup as a two-dimensional array. Nested for-loops are used to check whether a player has won. For example, the horizontal test only checks for columns from index 0 to 2 because you can't start at column index 3 to get 4-in-row. For the vertical test it is similar where we check rows from index 0 to 1 because starting at row index 2 will not get 4-in-row when checking downwards.

- **Heuristic evaluation functions**

In the same heuristic function we have our heuristic evaluations. In each for loop a heuristic variable is incremented or decremented by a certain value(200,80,150…) based on the number of sides open. Every situation that one-side-open or two-side-open could appear on the board is checked.

Minimax implementation

A depth is specified for the number of moves we want to see in the future. The minimax will switch between max and min values when *max_min_player* is true or false. If it is currently at a terminal state then there is nothing for the minimax to do. Because we have reached a win condition or the board is currently full.