Heuristic Analysis

1. My first custom score heuristic was a simple one: “Maximize the opponent’s number of illegal moves.” This performed pretty well at 65-70% winrate without too much variation.
2. My second heuristic was sort of serving as a control, it was a purely random based heuristic. Assign a randomly generated float to each possible outcome as the value. This performed almost exactly 50% every time which I alright if not a little high.
3. The final heuristic was checking for how many legal moves your player has in the next round if this game board is selected, and subtracting the opponent’s value from yours. This performed the best at 70%.

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                         Playing Matches
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Match #   Opponent    AB_Improved   AB_Custom   AB_Custom_2  AB_Custom_3
                       Won | Lost   Won | Lost   Won | Lost   Won | Lost
    1       Random      10  |   0    10  |   0     7  |   3    10  |   0
    2       MM_Open      7  |   3     8  |   2     5  |   5     5  |   5
    3      MM_Center    10  |   0    10  |   0     7  |   3    10  |   0
    4     MM_Improved    5  |   5     6  |   4     5  |   5     5  |   5
    5       AB_Open      4  |   6     4  |   6     6  |   4     4  |   6
    6      AB_Center     6  |   4     7  |   3     5  |   5     6  |   4
    7     AB_Improved    5  |   5     4  |   6     1  |   9     5  |   5
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          Win Rate:      67.1%        70.0%        51.4%        64.3%
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Essentially the problem with any heuristics created for this game is that since our agents can move in an “L” shape, traditional blocking isn’t nearly as viable a strategy. In fact to properly implement intelligent blocking would be prohibitively complicated, at least in the way I was thinking about it. Simple legal move related heuristics were effective as is so I stuck to the tried and true.