Heuristc Analisys – Adversarial Search

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Custom_score:

The best one is simple, this just combine the center_score with the improved_score multiplying both.

There is a modification in the center_score part. It was rewarding the player to stay away the center, I changed it to reward to stay next to the center

Custom_score_2:

This one tries to calculate the dominated area of each player, getting the area behind each, considering the players always facing their opponents.

As the first heuristic, this one also lends the improved_score to complement it.

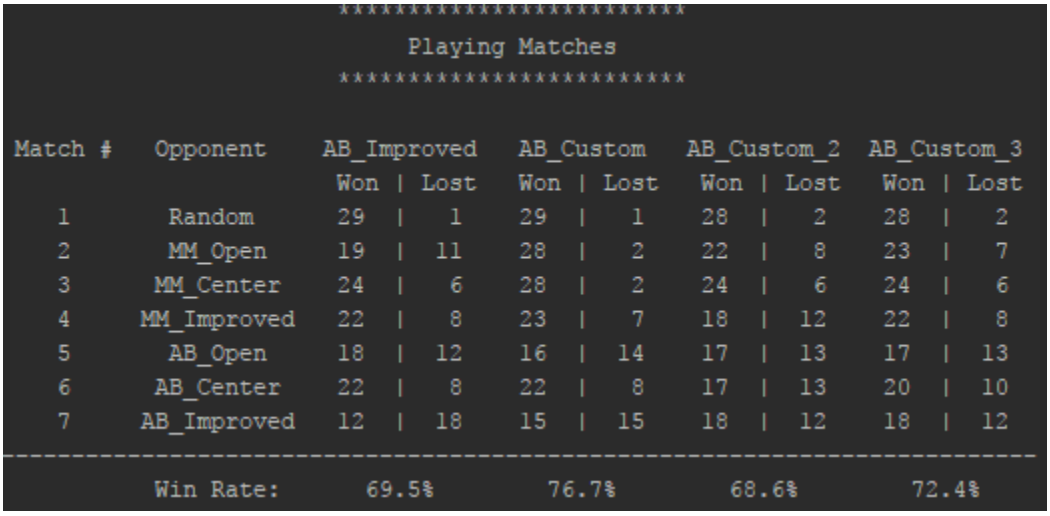
Custom_score_3:

This heuristic consists in find the “center of mass” of the blank spaces and then act as the custom_score, rewarding the agent for being closer to this center as possible.

Additionally, I calculated quantity of possible moves of the player minus the possible moves of the opponent, as the improved_score does.

Finally, I multiplied the both to have my heuristic.

Results Analysis:



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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      29  |   1    29  |   1    28  |   2    28  |   2
   2       MM_Open     19  |  11    28  |   2    22  |   8    23  |   7
   3      MM_Center    24  |   6    28  |   2    24  |   6    24  |   6
   4     MM_Improved   22  |   8    23  |   7    18  |  12    22  |   8
   5       AB_Open     18  |  12    16  |  14    17  |  13    17  |  13
   6      AB_Center    22  |   8    22  |   8    17  |  13    20  |  10
   7     AB_Improved   12  |  18    15  |  15    18  |  12    18  |  12
-------------------------------------------------------------------------
          Win Rate:      69.5%        76.7%        68.6%        72.4%
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All the results were very close, but the AB_Custom is consistent. I've ran the tournament several times, and it won mostly.

It's a shame that the blank center mass didn't the best, at least it is nice. Maybe the loop inside slows it, and it is not able to reach deeper trees.

So, the chosen one is the **Custom_score**, for the reasons below:

1. In the beginning of the study I've played some games of isolation against the min_max, and one of my concerns was not to stay locked up in the corners, and the other was ever stay in better conditions than my opponent. So, this one can translate my strategy in a simple form.
2. It's relative fast, there is no loops, or square roots, or anything that can slow down it. The Custom_score_3 for example, it translates better my strategy, but allow a less deep search, because it is complex.
3. And of course, it has the better win ration of all.