Heuristic analysis

Udacity - Artificial Intelligence Nanodegree

- custom_score1

In this function, just return the number of times that the current player can move minus the number of times that the opponent player can move.

own_moves - opp_moves

And, when a player lost the game, the agent will get negative reward (-∞). Contrary, when a player win the game, the agent will get positive reward(∞).

- custom_score2

This function is very similar with 'custom_score1'. I gave a weight to current player's movement. In this case, I set the weight to 2.

2*own_moves - opp_moves

Except this, all of things are same as custom_score1.

- custom_score 3

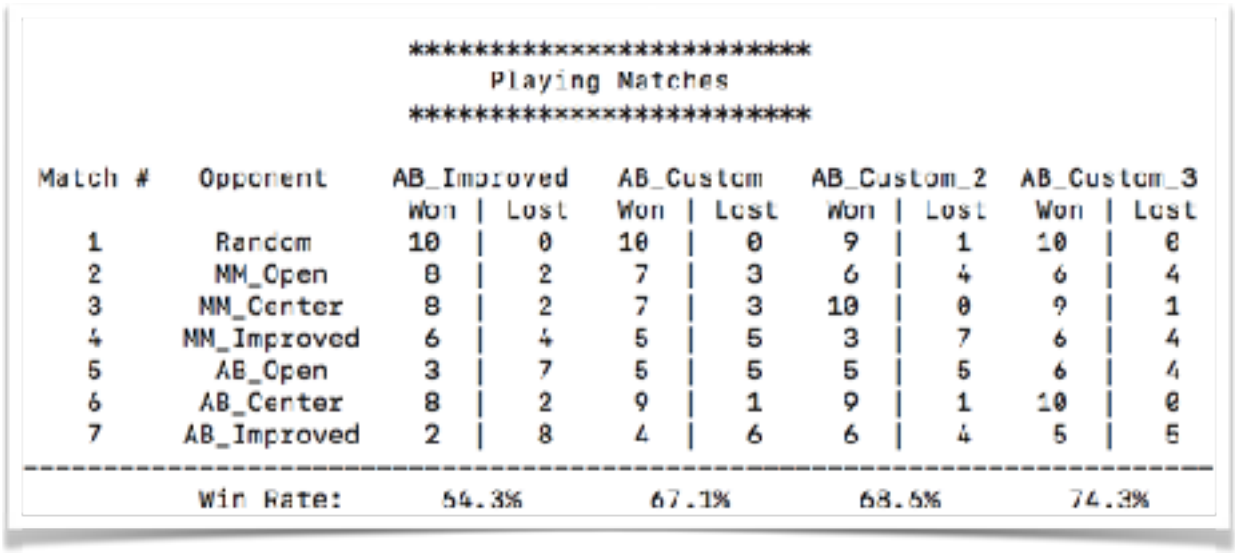
In this case, it is very similar with 'custom_score2'. I just switched the target of the weight.

own_moves - 2*opp_moves

Except this, all of things are same as custom_score2.

- Conclusion

Here is the result.



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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       9   |  1      10  |  0
    2       MM_Open      8  |  2        7  |  3       6   |  4       6  |  4
    3      MM_Center     8  |  2        7  |  3      10   |  0       9  |  1
    4    MM_Improved     6  |  4        5  |  5       3   |  7       6  |  4
    5       AB_Open      3  |  7        5  |  5       5   |  5       6  |  4
    6      AB_Center     8  |  2        9  |  1       9   |  1      10  |  0
    7    AB_Improved     2  |  8        4  |  6       6   |  4       5  |  5
--------------------------------------------------------------------------
          Win Rate:      54.3%        67.1%        68.6%        74.3%
```

So, I choose third heuristic(**custom_score3**; own_moves - 2*opp_moves). Because it took a quite good score(74.3%). And it is better than others. Although it is very easy to implement, it is powerful. I learned target of weight is important.