custom_score

Custom score works by a simple ratio between the currently available moves from the player verses the opponent. A weight is added to emphasis moves which limit the available moves the opponent can make over the available moves the player can make.

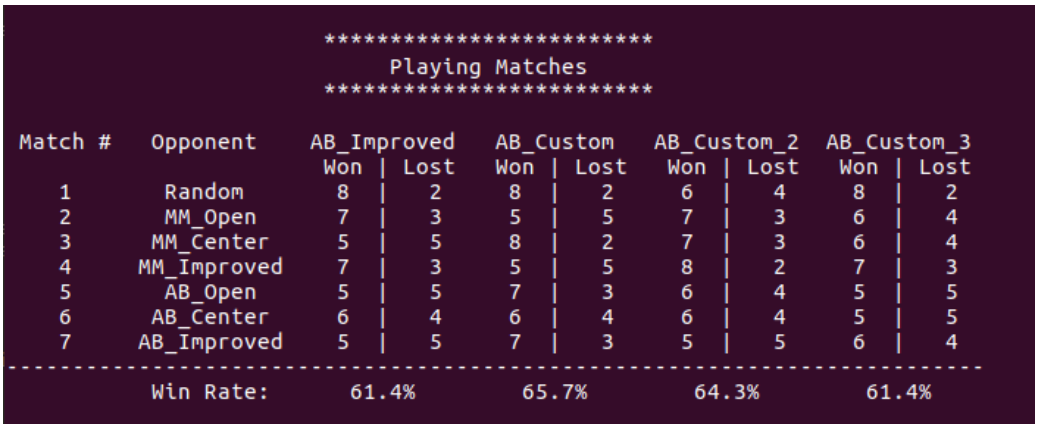
custom_score2

This heuristic was created with the idea that by making moves the gave the player more options and limiting the opponents options. This was done by calculating the available moves for every available combination one time step ahead.

custom_score3

Final scoring method was a variation of custom_score which also emphasized center distance. By reward the player for center map control and pushing for opponent center control. The idea being that center control would increase win likelihood due to more move option in the end game.

Heuristics Performance



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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       8  |   2     8  |   2     6  |   4     8  |   2
   2       MM_Open      7  |   3     5  |   5     7  |   3     6  |   4
   3      MM_Center     5  |   5     8  |   2     7  |   3     6  |   4
   4     MM_Improved    7  |   3     5  |   5     8  |   2     7  |   3
   5       AB_Open      5  |   5     7  |   3     6  |   4     5  |   5
   6      AB_Center     6  |   4     6  |   4     6  |   4     5  |   5
   7     AB_Improved    5  |   5     7  |   3     5  |   5     6  |   4
--------------------------------------------------------------------------
          Win Rate:      61.4%        65.7%        64.3%        61.4%
```

Custom_score provided the best performance when compared the AB_Improved test case. While quite a bit of variability, it consistently out performed the test case by 2% – 4%, leading to an average around 63%. Custom_score2 also performed well against the test case. The third test case under performed consistently despite various weights and alterations. Coincidentally, it was noticed the the highest performer is the simplest of the calculations, where as the one with the most consideration the poorest performer.

Recommendation

Custom_score is recommended on the following bases:

- Overall win rate: In testing, it constantly outperformed all other methods.
- Simplicity: While there remains one scaler to tweak best on scenario, making it simple to find the optimal value.
- Computational efficiency: the scalability is very high as it is linear with the number of tiles.