

# Heuristic Analysis

## My experiment settings:

Custom\_score :  $2 * \#my\_move - \#opp\_move$

Custom\_score\_2:  $-\#opp\_move$

Custom\_score\_3:  $score(\#my\_move) - score(\#opp\_move)$

Score function of Custom\_score\_3 is {0:-inf, 1:0, 2:0.5, 3: 1, 4:2, 5:2, 6:2, 7:2, 8:2}

Because of the randomness in game initiation, I set the number of matches to 50 in order to observe a more significant result.

## Experiment Results:

Win Percentage	AB_Improved	AB_Custom	AB_Custom_2	AB_Custom_3
Random	78	85	78	79
MM_open	64	71	66	72
MM_Center	80	77	71	75
MM_Improved	61	62	56	53
AB_Open	49	55	49	57
AB_Center	54	52	54	64
AB_Improved	48	53	42	53

The results show AB strategy have clear advantage over MM, however, the different heuristics don't differ too much compare to each other.

## Discussion:

Compare to standard isolation that one can move like a queen, in this game one can only move L-shape. Therefore, the situation of separation will never happen. In addition, the next move is at most 8, so one player can be easier to forfeit at early stage. In addition, it's also difficult say which position, for example middle, corner, or edge, is better. Therefore, a weighted strategy is also difficult to develop.

I'll pick up the AB\_Custom as final evaluation function. First, it has slightly better winning rate compare to others. Second, its win percentage is more stable compare to others, which means it might be more robust to random initiation. Third, compared last Custom\_score\_3, it's slightly faster.