

Heuristic Analysis

For an adversarial game playing agents for Isolation

1. Maximising the number of moves available for the player

This heuristic is the simplest implementation which aims to maximise the number of available moves for the player for every given game state. The algorithm is as follows:

```
moves available for the player - moves available for the opponent
```

2. Maximising the number of moves available for the player - weighted

This heuristic is a slight adjustment to the first heuristic. It attempts to define a more aggressive play method by increasing the weight of the opponent move when calculating the number of available moves for the player. The algorithm is as follows:

```
moves available for the player - moves available for the opponent*1.5
```

3. The ratio of player's moves to the opponent's

The last heuristic takes a different approach by calculating the value of each game state by calculating the ratio of moves for every player and opponent.

```
moves available for the player / moves available for the opponent
```

Results

Having run the tests to evaluate each of the above heuristics, the basic utility function that aims to maximise the player's available moves (Heuristic 1) performs much better than the more sophisticated heuristics (Heuristic 1 and 2).

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	10	0	7	3
2	MM_Open	7	3	10	0	7	3	3	7
3	MM_Center	10	0	10	0	9	1	9	1
4	MM_Improved	8	2	8	2	6	4	4	6
5	AB_Open	6	4	4	6	6	4	5	5
6	AB_Center	9	1	9	1	9	1	6	4
7	AB_Improved	6	4	6	4	6	4	2	8

Win Rate:		80.0%		81.4%		75.7%		51.4%	