

Heuristics Analysis

I've used 3 different heuristics for the game of isolation.

1. Center Score: Outputs a score equal to square of distance from the center of the board to the position of the player
2. Improved Score: Outputs a score equal to the difference in the number of moves available to the two players
3. Open Move Score: Outputs a score equal to the number of moves open for your computer player on the board

These evaluation functions are pretty straightforward and simple. Benchmarking it against a computer player, here are the results:

Match #	Opponent	AB_Improved		AB_Custom		AB_Custom2		AB_Custom3	
		won	lost	won	lost	won	lost	won	lost
1	Random	6	4	7	3	8	2	2	8
2	MM_Open	7	3	6	4	5	5	1	9
3	MM_Center	8	2	7	3	8	2	2	8
4	MM_Improved	6	4	4	6	8	2	1	9
5	AB_Open	5	5	4	6	5	5	0	10
6	AB_Center	6	4	5	5	6	4	1	9
7	AB_Improved	5	5	5	5	6	4	1	9
	Win Rate	61.4%		54.3%		65.7%		11.4%	

As you can see the evaluation functions that performed the best are the AB_Improved and the AB_Cusotm2. The poorly performed evaluation function is the 3rd one, which is AB_Custom3. This shows that just the number of moves alone for your opponent is not enough to predict who will win the game.

Base off of the scores, you can clearly see that the only function to beat AB_Improved was AB_Custom2. This made the game agent win by only 5% more times out of all the games played.