Artificial Intelligence Nanodegree

Project 3: Build Adversarial Game Playing Agent

Tables:

- Table 1: Default Score
- Table 2: Additive Score
- Table 3: Additive Score modulus Depth

Questions:

- What features of the game does your heuristic incorporate, and why do you think those features matter in evaluation states during the search?
- Analyze the search depth your agent achieves using your custom heuristic. Does search speed matter more or less than accuracy to the performance of your heuristic?

Tables:

Table 1: Default Score

```
return len(own_liberties) - len(opp_liberties)
```

Opponent	Moves	Time	Win Percentage
Random	10	default	85
Greedy	10	default	80
Minimax	10	default	70
Self	10	default	55

Table 2: Additive Score

```
return (len(own_liberties) + len(opp_liberties))
```

Opponent	Moves	Time	Win Percentage
Random	10	default	95
Greedy	10	default	90
Minimax	10	default	45
Self	10	default	50

Table 3: Additive Score modulus Depth

```
if depth == 0:
            depth = 1
return (len(own_liberties) + len(opp_liberties)) / depth
```

Opponent	Moves	Time	Win Percentage
Random	10	default	100
Greedy	10	default	75
Minimax	10	default	50
Self	10	default	60

Questions:

What features of the game does your heuristic incorporate, and why do you think those features matter in evaluation states during the search?

I utilized the depth feature for my heuristic. Through that, I was able to find the alpha and beta scores for multiple moves. The more depth that Alpha Beta Search has the better it can find the Minimum and Maximum scores for the player and the opponent.

Analyze the search depth your agent achieves using your custom heuristic. Does search speed matter more or less than accuracy to the performance of your heuristic?

Based on the depth, it seems that the accuracy of the heuristic helps with the performance of the heuristic more than speed. With accuracy we were able to minimize depth and the algorithm performed better.

This ultimately better accuracy with pruning also helped with the speed of the algorithm in the end.