

## Build an Adversarial Game Playing Agent

### Result List

Opponent	Matches	Time Limit (ms)	Win pct	Exec Time (s)
GREEDY	100	150	86.5	63
GREEDY	100	150	83.0	65
GREEDY	100	150	83	64
MINIMAX	100	150	54	87
MINIMAX	100	150	52.5	80
MINIMAX	100	150	57.5	86
SELF	100	150	50	106
SELF	100	150	50	109
SELF	100	150	50	106

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

More open liberties correspond to a higher chance of winning the game. Hence, I modified the heuristic by adding

- a bias that double the weight of the opponents liberties, i.e.

$$\text{my\_liberties} - 2 * \text{opponent\_liberties}$$

- the difference of the sum of the remaining liberties, again with the same bias for the opponent liberty weight, i.e.

$$\text{my\_remaining\_liberties} - 2 * \text{opponent\_remaining\_liberties}$$

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?

Opponent	Time Limit (ms)	Depth	Win pct	Exec Time (s)
MINIMAX	150	2	49	46
MINIMAX	150	2	54	41
MINIMAX	150	2	53	69
MINIMAX	150	2	64	69

Search time increase dramatically with increased depth. However, win percentage only improves slightly.