**Project 3: Build an Adversarial Game Playing Agent**

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| **Opponent** | **Number of matches** | **Time limit (ms)** | **Execution time (s)** | **Percentage of Winning** |
| RANDOM | 100 | 150 | 50.22 | 97.0% |
| RANDOM | 100 | 150 | 48.39 | 89.0% |
| RANDOM | 100 | 150 | 49.06 | 91.0% |
| GREEDY | 100 | 150 | 62.02 | 61.0% |
| GREEDY | 100 | 150 | 63.54 | 68.0% |
| GREEDY | 100 | 150 | 62.14 | 74.0% |
| MINIMAX | 100 | 150 | 72.68 | 47.0% |
| MINIMAX | 100 | 150 | 68.58 | 51.0% |
| MINIMAX | 100 | 150 | 80.50 | 48.0% |
| SELF | 100 | 150 | 73.29 | 57.0% |
| SELF | 100 | 150 | 75.04 | 54.0% |
| SELF | 100 | 150 | 74.59 | 55.0% |

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

The heuristic incorporates 2 values, the agent liberties, and the opponent liberties. It assumes that the more available spots for my agent, the higher the chances of winning are. On the other hand, it penalties the opponent's liberties, meaning the more spots my opponent has, the lower my chances of winning. Finally, it considers the merged situation, considering both, what my chances of winning.

1. **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?**

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| **Opponent** | **Number of matches** | **Time limit (ms)** | **Depth limit** | **Execution time (s)** | **Percentage of Winning** |
| GREEDY | 100 | 150 | 2 | 34.06 | 33.0% |
| GREEDY | 100 | 150 | 3 | 42.93 | 73.0% |
| GREEDY | 100 | 150 | 4 | 57.57 | 69.0% |

In terms of winning, one can see that there is a drastic improvement between going from depth 2 to 3. However, increasing the depth to 4 did not yield much improvement. One can also notice that the number doubles when increasing the depth to 3.