Heuristic Analysis

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Objective

The project attempts to devise an AI agent for the game of Isolation. The agent relies on Minimax algorithm with iterative deepening and alpha beta pruning to return best moves for a player within a given time constraint. The agent tests the below 3 heuristics against a few other AI agents and will eventually select a heuristic function which provides the best win rate

Heuristic 1

Custom Score 1: my\_moves – 2\* opponents’s moves

This function emphasizes aggressive play against the opponent by evaluating the margin of moves between 2 players. This is bases on the thumb rule that the player with more available moves generally wins.

Heuristic 2

Custom Score 2: my moves – 2\* minimum of opponent’s moves for the next ply

An improvement over the first function, this function maximizes the move margin between the two players by choosing the game tree node which provides least moves to the opponent on his next turn. This is possible by utilizing the forecast move function of the board class.

Heuristic 3

Custom Score 3 : (my moves – 2\* opponent moves) + blank spaces/2

This is another take on the first function where we try to give a leg up to our agent in the early game. In the early game there are more blank spots to occupy, hence combined with the logic of function 1, our AI agent will maximize the move margin more aggressively during the beginning

Comparative Performance

Conclusion