Heuristic Analytics

Introduction

This project provides an agent which can play the game Isolation by the help of the minimax algorithm for determining the moves. The quality of the agent's chosen moves depends on the heuristic that is used by the algorithm.

Heuristic Functions

I will give a short summary on the heuristic funtions used for evaluation purposes

Heuristic Function 0

Outputs a score equal to the difference in the number of moves available to the two players, while penalizing the moves for the maximizing player that are in the corner and rewarding the moves for the minimizing player that are in the corner. These penalties/rewards are elevated near end game through a game state factor. Submitted

Heuristic Function 1

open_move_walls:
Outputs a score equal to the difference in the number of moves available to the two players, while penalizing the moves for the maximizing player that are against the wall and rewarding the moves for the minimizing player that are against the wall. Not submitted.

Heuristic Function 2

run_towards:
Minimize the distance between the player and the opponent, i.e., run towards from the opponent. Returns the negative of the absolute difference between the sum of the location vectors, therefore rewarding smaller absolute differences with higher scores. Not submitted.

Evaluation

This is the output of the tournament script, showing the results when playing against some other AI-players:

Obviously function 2 (**run_towards**) is the best heuristic function. This one has won nearly 53% of the games that were played whereas function has only won 50% and function 3 has won 47%.

It seems to be wise to minimize the distance between the player and the opponent.