Isolation Heuristic Analysis

1.) Player move opposition using subtraction with pursuit amplifier

The heuristic is similarly to the sample improved player heuristic whereby the players moves are subtracted from the opponents moves. However, I wanted the evaluation function to decrease the weight of the opponents moves over time so I used the current move count of the board.

Results:

ID_Improved = ~63% and Student = ~75%

2.) Player move opposition using division

Same idea as improved heuristic but instead of subtraction I wanted to try division. Since we're using division the algorithm checks to see if either own_moves or opponents_moves are 0 and assigns +/-infinity or, in case of a draw, -10.

Results:

ID_Improved = ~68% and Student = ~71%

3.) Free Spaces Surrounding Player

I was trying to find a way to use blank spaces more effectively but I thought the overall count of blank spaces was less important than the surrounding spaces around a player. Therefore, I calculated the surrounding spaces for both players and subtracted them.

Results:

ID_Improved = ~ 70% and Student = ~65%

Overall

All three heuristics use an adversarial approach to evaluate the board. Simply maximizes your own legal moves or surrounding space isn't enough to create a significant partition to outlast the opponent. However, the last heuristic performs much more poorly than the other two. The last heuristic uses the available free spaces which doesn't necessarily correspond to available(i.e. legal) moves. Therefore, among the remaining two adversarial heuristics, I would choose the first heuristic because it performs the best consistently, it's dynamic, and it's adversarial.

Results