Heuristic for L shaped isolation

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I defined three heuristics for the project and chose final one while submitting the project based on test results. For experiments, I ran each tournament 5 times and present my result with each of three heuristics across those 5 tournaments later in the document. In effect I ran 100 *5 = 500 games per heuristic for student player vs improved player. In summary I did not see a better score than improved player. Below I first present each of the heuristic with its result on the tournament.

Heuristic_priority:

As we see that its beneficial for a player to move towards center of the board as opposed to rims and corners. This became the basis of my first heuristic. I assumed that even if center pieces or good positions have less score that would still be better than corners or rims. Result of this heuristic is not that bad in comparison; given that we don't take opponent moves into account at all.

Please see code for more details in function heuristic_priority. I came up with random weight(score) if move is in eights etc. and -ve score if move is in bad position like rims or corner.

Tournament #	Improved	Student - heuristic priority
1	57.14%	52.86%
2	60.00%	55.00%
3	57.00%	51.14%
4	57.86%	57.14%
5	62.00%	53.00%

Heuristic_penalty:

This heuristic was slight improvement over our first heuristic in theory. For e.g. for a given proposed move if it has any further legal moves(its 2 level deep from get move function) which are in opponent legal moves then we penalize those moves. Amount of penalty based on the move is higher for a better move because that move is what we expect the opponent to take as it is a good move.

Tournament #	Improved	Student - heuristic penalty(priority + penalty)
1	60.00%	52.86%
2	65.00%	55.71%
3	61.43%	47.00%
4	60.71%	48%
5	57.00%	54%

Unfortunately above heuristic didn't work out better than improved score.

Heuristic_final

This is the heuristic which combines above two heuristics with slight modification to second one; in that it uses improved score with penalty. While choosing one of the heuristics it uses first for initial part of game when there were sufficient blank moves and second for the later part.

Tournament #	Improved	Student - heuristic improved + penalty/ priority
1	60.00%	58.00%
2	61.00%	63.00%
3	59.00%	61.00%
4	56.00%	53%
5	59.00%	63%