Heuristic search

Three heuristic scores were made. The first one in to try to move the reflection point of the opponent. For example, when the opponent is in (4,5), the player tries to move closer to (2, 1) which is the reflection point if we regard (3,3) as the centre of the board. The second heuristic tries to move where the number of available moves of the player is maximum and tries to minimize the number of possible moves for the opponent. This is similar to what was referred to in the lecture. The third one is similar to the second one. It also counts the number of moves of the player and the opponent, and tries to maximize the number of the player's move while trying to minimize the number of opponent's move. It also tries to move closer to the centre of the board because the number of possible moves would be limited around the corners of the board. It also tries to move closer to where the opponent is.

The overall win rate for each heuristic score was 68.6%, 61.4% and 62.9% respectively. I chose the first heuristic as the final heuristic score for three reasons. First, it achieved the highest win rate. We want the agent to win as many as possible, and the win-rate clearly measures the probability of winning the game. Second, the strategy is intuitively simple. While the second and the third heuristics are difficult to imagine what exactly the player is doing, we can visually imagine how the player is expected to move; it tries to move to the reflection point. If the win-rate is low, you can easily guess that the strategy of moving to the reflection point is not a good strategy and you know you need to improve the strategy. Third, we can expect that the player wins if the opponent plays first and it does not start from the centre of the board. This can be also confirmed from the win-rate against the Random Player; it achieved 90% win-rate.

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        Playing Matches
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Match #	Opponent	AB_Improved Won | Lost	AB_Custom Won | Lost	AB_Custom_2 Won | Lost	AB_Custom_3 Won | Lost
1	Random	9 | 1	9 | 1	8 | 2	5 | 5
2	MM_Open	4 | 6	5 | 5	5 | 5	7 | 3
3	MM_Center	8 | 2	9 | 1	9 | 1	9 | 1
4	MM_Improved	8 | 2	9 | 1	7 | 3	8 | 2
5	AB_Open	2 | 8	6 | 4	4 | 6	4 | 6
6	AB_Center	5 | 5	5 | 5	4 | 6	7 | 3
7	AB_Improved	5 | 5	5 | 5	6 | 4	4 | 6
	Win Rate:	58.6%	68.6%	61.4%	62.9%

There were 18.0 timeouts during the tournament -- make sure your agent handles search timeout correctly, and consider increasing the timeout margin for your agent.

Your ID search forfeited 88.0 games while there were still legal moves available to play.