Isolation Game Evaluation Function Analysis

As part of Isolation Game project for Udacity AI Nanodegree. I have developed 3 heuristic functions to determine best moves using by the MInimax algorithm.

For all 3 heuristic functions, they all check to see if the move will result a winning state for the player. If the move will lead to an winning state, positive infinite will be returned, otherwise return negative infinite.

Results of heuristic function[1]:

Division Score :

Evaluating: ID_Improved	Evaluating: Student
86.915%	89.105%

See The Future:

Evaluating: ID_Improved	Evaluating: Student
89.142%	88.57%

See The Future:

Evaluating: ID_Improved	Evaluating: Student
88.015%	90.895%

Conclusion:
The *division score* is similar to the *open move* method. However, I realize that the ratio of number of player moves and number of opponent moves is a better representation of the better move comparing to subtraction of those two.

The *see the future* method uses *division score* as its base and subtract the number of moves that current move can lead to. The player move that restrict opponent moves greatly will be given a higher score.

The *see the future improved* method is the one I eventually choose. In the earlier part of the game (blank space > 20), the move allows more future moves for the place will have a higher score. When the game comes close to finish (blank space < 20), the move allows less future

moves for opponents will have a higher score. It seems this strategy have the highest score among all 3 methods. So I end up using it.

1. Result shown is the average score of 5 repeated execution.