1:Summary

Aim of the project is to evaluate a two player game of Isolation where each player can attempt L shaped
moves.Each block traversed in previous moves are blocked for remainder of the game. Player with no legal moves loses
the game.

2:Heuristic Analysis

**********Heuristic1**********

In my opinion is the Heuristic 2 is better option as it has the best score in comparison to heuristic 1.

heuristic_1= (heuristic_value = float(player_moves - 2 * opponent_moves))
heuristic_1 allocates a constant 2 to the opposite player's available moves and
then subtracts the value from current player available moves.

****
Evaluating: ID_Improved
****

Playing Matches:

Match 1: ID_Improved vs Random Result: 20 to 0
Match 2: ID_Improved vs MM_Null Result: 20 to 0
Match 3: ID_Improved vs MM_Open Result: 16 to 4
Match 4: ID_Improved vs MM_Improved Result: 18 to 2
Match 5: ID_Improved vs AB_Null Result: 20 to 0
Match 6: ID_Improved vs AB_Open Result: 18 to 2
Match 7: ID_Improved vs AB_Improved Result: 16 to 4

Results:

ID_Improved 91.43%

****
Evaluating: Student
****

Playing Matches:

Match 1: Student vs Random Result: 19 to 1
Match 2: Student vs MM_Null Result: 20 to 0
Match 3: Student vs MM_Open Result: 18 to 2
Match 4: Student vs MM_Improved Result: 16 to 4
Match 5: Student vs AB_Null Result: 20 to 0
Match 7: Student vs AB_Improved Result: 13 to 7

Results:

Student 89.29%

**********heuristic_2**********

heuristic_2= (heuristic_value = float(player_moves - 4 * opponent_moves))

heuristic_2 allocates a constant 4 to the opposite player's available moves and
then subtracts the value from current player available moves.

****
Evaluating: ID_Improved
****

5,3
Match 1: ID_Improved vs Random Result: 19 to 1
Match 2: ID_Improved vs MM_Null Result: 19 to 1
Match 3: ID_Improved vs MM_Open Result: 17 to 3
Match 4: ID_Improved vs MM_Improved Result: 17 to 3
Match 5: ID_Improved vs AB_Null Result: 19 to 1
Match 6: ID_Improved vs AB_Open Result: 18 to 2
Match 7: ID_Improved vs AB_Improved Result: 15 to 5

Results:

ID_Improved 88.57%

****
Evaluating: Student

Playing Matches:

Match 1: Student vs Random Result: 19 to 1
Match 2: Student vs MM_Null Result: 20 to 0
Match 3: Student vs MM_Open Result: 18 to 2
Match 4: Student vs MM_Improved Result: 18 to 2
Match 5: Student vs AB_Null Result: 18 to 2
Match 6: Student vs AB_Open Result: 18 to 2
Match 7: Student vs AB_Improved Result: 18 to 2

Results:

Student 92.14%

**********Heuristic 3**********

heuristic_3= heuristic_value = float(currPlayer - oppPlayer)
heuristic_3 subtracts opposite player's available moves and
with current player available moves.

****
Evaluating: ID_Improved
****

Playing Matches:

Match 1: ID_Improved vs Random Result: 18 to 2
Match 2: ID_Improved vs MM_Null Result: 20 to 0
Match 3: ID_Improved vs MM_Open Result: 17 to 3
Match 4: ID_Improved vs MM_Improved Result: 17 to 3
Match 5: ID_Improved vs AB_Null Result: 19 to 1
Match 6: ID_Improved vs AB_Open Result: 17 to 3
Match 7: ID_Improved vs AB_Improved Result: 18 to 2

Results:

ID_Improved 90.00%

****
Evaluating: Student

****

Playing Matches:

Match 1: Student vs Random Result: 19 to 1
Match 2: Student vs MM_Null Result: 18 to 2
Match 3: Student vs MM_Open Result: 10 to 10
Match 4: Student vs MM_Improved Result: 17 to 3
Match 5: Student vs AB_Null Result: 19 to 1
Match 6: Student vs AB_Open Result: 18 to 2
Match 7: Student vs AB_Improved Result: 17 to 3

Results:

Student 84.29%

	Random	MM_Null	MM_Open	MM_improved	AB_null	AB_Open	AB_Improved	
Student Heuristic 1	19/1	20/0	18/2	16/4	20/0	19/1	13/7	
Student Heuristic2	19/1	20/0	18/2	18/2	18/2	18/2	18/2	
Student Heuristic 3	19/1	18/2	10/010	17/3	19/1	18/2	17/3	
	Random	MM_Null	MM_Open	MM_improved	AB_null	AB_Open	AB_Improved	Mean
Student Heuristic 1	85	100	90	80	100	95	65	88
Student Heuristic2	85	100	90	90	90	90	90	91
Student Heuristic 3	85	90	50	85	95	90	85	83

Conclusion:

Heuristic 2 is the best evaluation function as the mean result indicate that it is better than Heuristic 1 and Heuristic 3.
The denominator of Heuristic 2 is better than other evaluation function