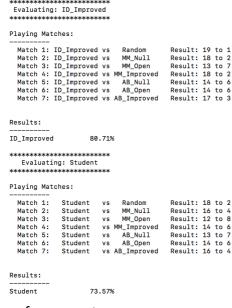Gelei Chen
March 4, 2017

1. Number of my moves
    a. 73.5%. The heuristic function here is number of my moves. This heuristic function can help me win most of the time by selecting relatively reasonable path that maximizes this heuristic function. But it fails to consider opponent's situation.

    ```
    ************************
     Evaluating: ID_Improved
    ************************

    Playing Matches:
    ----------
      Match 1: ID_Improved vs    Random     Result: 19 to 1
      Match 2: ID_Improved vs    MM_Null    Result: 18 to 2
      Match 3: ID_Improved vs    MM_Open    Result: 13 to 7
      Match 4: ID_Improved vs MM_Improved   Result: 18 to 2
      Match 5: ID_Improved vs    AB_Null    Result: 14 to 6
      Match 6: ID_Improved vs    AB_Open    Result: 14 to 6
      Match 7: ID_Improved vs AB_Improved   Result: 17 to 3


    Results:
    ----------
    ID_Improved         80.71%

    ************************
       Evaluating: Student
    ************************

    Playing Matches:
    ----------
      Match 1:    Student   vs    Random     Result: 18 to 2
      Match 2:    Student   vs    MM_Null    Result: 16 to 4
      Match 3:    Student   vs    MM_Open    Result: 12 to 8
      Match 4:    Student   vs MM_Improved   Result: 14 to 6
      Match 5:    Student   vs    AB_Null    Result: 13 to 7
      Match 6:    Student   vs    AB_Open    Result: 14 to 6
      Match 7:    Student   vs AB_Improved   Result: 16 to 4


    Results:
    ----------
    Student             73.57%
    ```
    b.

2. Number of opponent moves
    a. 69.29%. The heuristic function here is number of my opponent moves. This heuristic function achieves worse score than first heuristic function by selecting relatively reasonable path for my opponent that maximizes this heuristic function. I definitely don't want to use this heuristic function.

    ```
    ************************
     Evaluating: ID_Improved
    ************************

    Playing Matches:
    ----------
      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: 15 to 5
      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         88.57%

    ************************
       Evaluating: Student
    ************************

    Playing Matches:
    ----------
      Match 1:    Student   vs    Random     Result: 17 to 3
      Match 2:    Student   vs    MM_Null    Result: 18 to 2
      Match 3:    Student   vs    MM_Open    Result: 11 to 9
      Match 4:    Student   vs MM_Improved   Result: 14 to 6
      Match 5:    Student   vs    AB_Null    Result: 15 to 5
      Match 6:    Student   vs    AB_Open    Result: 10 to 10
      Match 7:    Student   vs AB_Improved   Result: 12 to 8


    Results:
    ----------
    Student             69.29%
    ```
    b.

3. Number of my moves – Number of opponent moves

a. 90%. The heuristic function here is number of my moves minus number of opponent moves. This heuristic function can help me win most of the time by selecting relatively optimal path that maximizes this heuristic function. That's why I select this heuristic function to be my final choice.

```
*************************
 Evaluating: ID_Improved
*************************

Playing Matches:
----------
  Match 1: ID_Improved vs   Random      Result: 19 to 1
  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: 13 to 7
  Match 5: ID_Improved vs   AB_Null     Result: 19 to 1
  Match 6: ID_Improved vs   AB_Open     Result: 19 to 1
  Match 7: ID_Improved vs AB_Improved   Result: 16 to 4


Results:
----------
ID_Improved         87.86%

*************************
    Evaluating: Student
*************************

Playing Matches:
----------
  Match 1:   Student   vs    Random     Result: 18 to 2
  Match 2:   Student   vs    MM_Null    Result: 19 to 1
  Match 3:   Student   vs    MM_Open    Result: 18 to 2
  Match 4:   Student   vs MM_Improved   Result: 19 to 1
  Match 5:   Student   vs    AB_Null    Result: 18 to 2
  Match 6:   Student   vs    AB_Open    Result: 19 to 1
  Match 7:   Student   vs AB_Improved   Result: 15 to 5


Results:
----------
Student             90.00%
```

b.