```
                    ************************
                         Playing Matches
                    ************************

 Match #    Opponent    AB_Improved   AB_Custom   AB_Custom_2  AB_Custom_3
                        Won | Lost   Won | Lost   Won | Lost   Won | Lost
    1        Random      9  |   1     9  |   1     9  |   1     9  |   1
    2        MM_Open     7  |   3     6  |   4     7  |   3     7  |   3
    3       MM_Center    9  |   1     8  |   2     8  |   2    10  |   0
    4     MM_Improved    6  |   4     4  |   6     6  |   4     9  |   1
    5        AB_Open     4  |   6     5  |   5     6  |   4     5  |   5
    6       AB_Center    8  |   2     5  |   5     5  |   5     6  |   4
    7     AB_Improved    5  |   5     4  |   6     5  |   5     7  |   3
--------------------------------------------------------------------------
           Win Rate:      68.6%        58.6%        65.7%        75.7%

Your ID search forfeited 157.0 games while there were still legal moves available to play.
```

Game No.1

```
                    ************************
                         Playing Matches
                    ************************

 Match #    Opponent    AB_Improved   AB_Custom   AB_Custom_2  AB_Custom_3
                        Won | Lost   Won | Lost   Won | Lost   Won | Lost
    1        Random      9  |   1     8  |   2     6  |   4     8  |   2
    2        MM_Open     6  |   4     7  |   3     6  |   4     7  |   3
    3       MM_Center    8  |   2     8  |   2     8  |   2     7  |   3
    4     MM_Improved    6  |   4     6  |   4     5  |   5     8  |   2
    5        AB_Open     6  |   4     5  |   5     5  |   5     6  |   4
    6       AB_Center    4  |   6     5  |   5     4  |   6     8  |   2
    7     AB_Improved    5  |   5     5  |   5     5  |   5     4  |   6
--------------------------------------------------------------------------
           Win Rate:      62.9%        62.9%        55.7%        68.6%

Your ID search forfeited 167.0 games while there were still legal moves available to play.
```

Game No.2

Three heuristic functions are implemented.

Heuristic function No.3 counts the number of legal moves for the current player in the next turn, and then subtracts that count with the number of legal moves for the opponent in the next turn.

Heuristic function No.2 looks at all the legal moves for the current player, and, instead of simply counting them, assign a evaluation score to the move. The further away the move is from the center of the board, the higher the evaluation score is. After calculating the total evaluation score for the current player, the function does so for the opponent as well. Finally, it subtracts current player's total score with opponent's total score.

Heuristic function No.1 works quite similarly to No.2 with one major exception. Rather than favor moves that are far away from the board center, the function prefers moves that are as close to the center of the board as possible.

Three observations have been made.

Firstly, the tournament result varies. The two attached game evaluations show that not only does win rate change but the ranking also varies between tournaments.

Secondly, heuristic function No.3 seem to consistently beat the provided benchmark player. This pattern is found in most, though not all, tournaments that have been run.

Lastly, an unusually high amount of games (about 160) are forfeited in each tournament, suggesting more potential improvements for the implementation of player.

Heuristic function No.3 is recommended as the preferable evaluation function for the following three reasons.

1. It consistently achieves a higher win rate than the provided benchmark player, as shown in the two games above and other games that are not attached.
2. It is trivial to compute and thus takes little time, allowing a deeper traverse of the game tree.
3. Unlike the benchmark player that only considers the quantity of legal moves, it takes (its own interpretation of) quality into account as well.