OMAR AHMAD MOHAMED
WID-170704//17121293/1

HEURISTIC ANALYSIS

My custom heuristic algorithm:

My custom heuristic was inspired by the aggressive heuristic and the maximizing_win_chances_heuristic. Where the function goes as follows:

 if game.is_loser(player):
     return float("-inf")

 if game.is_winner(player):
     return float("inf")

1)First we get the player moves.
   own_moves = len(game.get_legal_moves(player))
2)Second we get the opponent's moves.
   opp_moves = len(game.get_legal_moves(game.get_opponent(player)))
3)Then we subtract own_moves - x*opp_moves where x is a given weight that is decided by trial.
4)Then we divide the value from (3) by (own_moves+opp_moves)
5)Then we multiply the value from (4) by 100 to get the percentage weight.
     return 100.0 * (own_moves - 1.8 * opp_moves) / (own_moves + opp_moves)
6)The value of the given weight x was chosen to be 1.8 after trials.

Results:
As shown below the custom heuristic performance is far better than the ID_improved.

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 Evaluating: ID_Improved

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Playing Matches:

  Match 1: ID_Improved vs   Random   Result: 170 to 30
  Match 2: ID_Improved vs   MM_Null   Result: 147 to 53
  Match 3: ID_Improved vs   MM_Open   Result: 97 to 103
  Match 4: ID_Improved vs MM_Improved   Result: 83 to 117
  Match 5: ID_Improved vs   AB_Null   Result: 130 to 70
  Match 6: ID_Improved vs   AB_Open   Result: 116 to 84
  Match 7: ID_Improved vs AB_Improved   Result: 119 to 81

Results:

ID_Improved   61.57%

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Evaluating: Omar_Ahmad_GROUP_5

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Playing Matches:

  Match 1: Omar_Ahmad_GROUP_5 vs   Random   Result: 182 to 18
  Match 2: Omar_Ahmad_GROUP_5 vs   MM_Null   Result: 169 to 31
  Match 3: Omar_Ahmad_GROUP_5 vs   MM_Open   Result: 109 to 91
  Match 4: Omar_Ahmad_GROUP_5 vs MM_Improved   Result: 109 to 91
  Match 5: Omar_Ahmad_GROUP_5 vs   AB_Null   Result: 157 to 43
  Match 6: Omar_Ahmad_GROUP_5 vs   AB_Open   Result: 129 to 71
  Match 7: Omar_Ahmad_GROUP_5 vs AB_Improved   Result: 133 to 67

Results:

Omar_Ahmad_GROUP_5   70.57%