--Performance of evaluation functions

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                             Playing Matches
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 Match #    Opponent     AB_Improved    AB_Custom    AB_Custom_2   AB_Custom_3
                          Won  | Lost    Won  | Lost    Won  | Lost    Won  | Lost
    1        Random       18   |   2     19   |   1     19   |   1     18   |   2
    2        MM_Open      16   |   4     15   |   5     12   |   8     14   |   6
    3       MM_Center     19   |   1     15   |   5     15   |   5     14   |   6
    4     MM_Improved     14   |   6     14   |   6     14   |   6     17   |   3
    5        AB_Open       9   |  11     10   |  10     10   |  10     11   |   9
    6       AB_Center     11   |   9     11   |   9      7   |  13      9   |  11
    7     AB_Improved      8   |  12     10   |  10      7   |  13      6   |  14
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           Win Rate:      67.9%        67.1%        60.0%        63.6%
```

Above results are based on 20 games per opponent with the user agents.

Custom Function gives better results than Custom 2 and Custom 3 functions.

The 3 custom functions were tested using tournament.py file.
Custom Function – This function uses distance from center along with difference of active player legal moves and 1.5 times legal moves of inactive player to arrive at a final value. This function initially will give higher weightage to positions which are far away from center position and later (when empty spaces on board are less than 30% of total positions) will give more value to positions which are closer to center. The reason for doing this is, in most of cases, corner positions or last row/column positions have less number of legal moves as compared to center of the board positions. Since initially most of the board is empty, we can still utilize corner positions. Later on when board gets filled, It calculates the current position closeness to center position along with the number of empty spaces remaining. Active Player's current position difference is calculated with the center position. The x and y coordinate difference is squared (to get positive values) and summed.
When most of the board (more than 30%) is empty the above calculated value is used.
For later positions, i.e., when most of the board is filed, Final output is inverse of that, as a point which is close to center will have low difference. So the inverse will return the higher value, i.e., the closer a position is with center, the higher value is returned.
Finally, this value is multiplied with difference of active player legal moves and 1.5 times legal moves of inactive player to arrive at a final value. This is done to give more value to a position which has more legal moves than the other player in case the distance from center position is same.

Custom Function 2 – It calculates the current position closeness to center position.
Active Player's current position difference is calculated with the center position. The x and y coordinate difference is squared (to get positive values) and summed. Final output is inverse of that, as a point which is close to center will have low difference. So the inverse will return the higher value, i.e., the closer a position is with center, the higher value is returned.

Custom Function 3 – This function just calculates the difference between the legal moves of the active player with 2 times the legal moves of an inactive player. So a position where

Since Custom Function utilizes corner positions initially, closeness to center position later and also takes into account the difference of active player legal moves and 1.5 times the legal moves of inactive player, it seems to cater to various scenarios and gives the best possible results as compared to other custom functions.