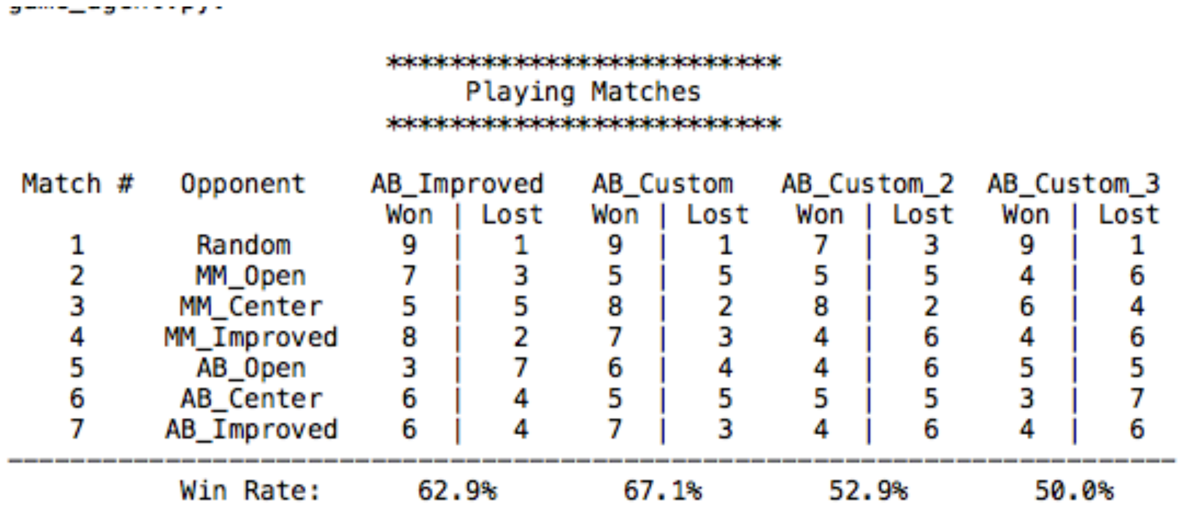
Heuristic Evaluations



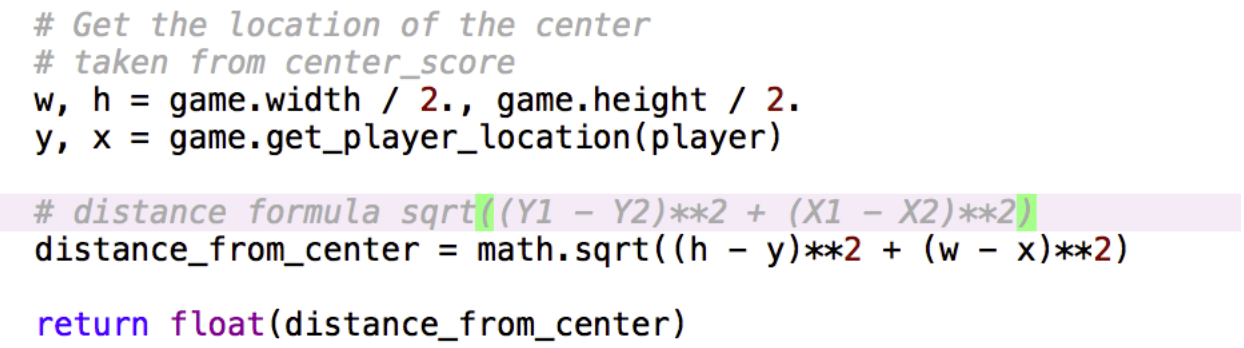
```
game_agent.py:

                         *************************
                              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     7  |   3     9  |   1
    2         MM_Open       7  |   3     5  |   5     5  |   5     4  |   6
    3        MM_Center      5  |   5     8  |   2     8  |   2     6  |   4
    4       MM_Improved     8  |   2     7  |   3     4  |   6     4  |   6
    5         AB_Open       3  |   7     6  |   4     4  |   6     5  |   5
    6        AB_Center      6  |   4     5  |   5     5  |   5     3  |   7
    7       AB_Improved     6  |   4     7  |   3     4  |   6     4  |   6
--------------------------------------------------------------------------
           Win Rate:      62.9%        67.1%        52.9%        50.0%
```

Distance_from_center – custom_score_1

Description: Evaluates the distance between the players current location and the center of the board with the distance formula

$$\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$

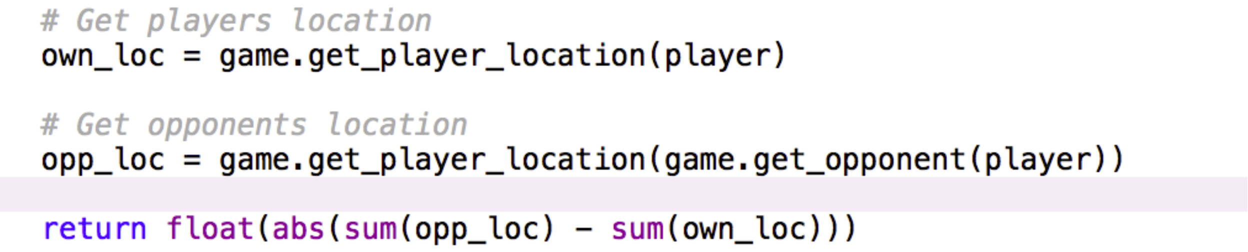
Reason: Based on the center_score heuristic where the lesson mention that the center board was always a good move regardless if you were starting or going second.
Result: Actually beat AB_improved by 4.2%
Code:



```
# Get the location of the center
# taken from center_score
w, h = game.width / 2., game.height / 2.
y, x = game.get_player_location(player)

# distance formula sqrt((Y1 - Y2)**2 + (X1 - X2)**2)
distance_from_center = math.sqrt((h - y)**2 + (w - x)**2)

return float(distance_from_center)
```

run_away – custom_score_2

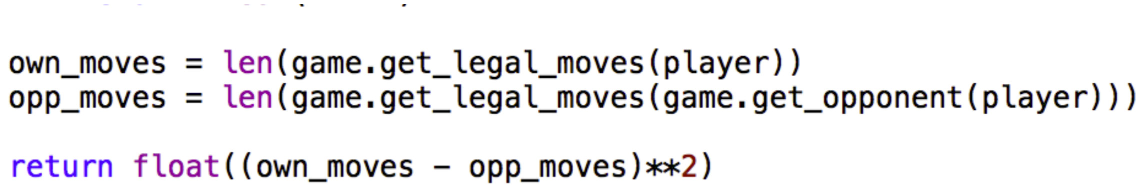
Description: Calculates the distance between you and your opponent.
Reason: Simple strategy that utilizes keeping your opponent as far as possible thus leaving you with more moves around you.
Result: Ended up doing horrible against AB_Improved but with similar results in most area
Code:



```
# Get players location
own_loc = game.get_player_location(player)

# Get opponents location
opp_loc = game.get_player_location(game.get_opponent(player))

return float(abs(sum(opp_loc) - sum(own_loc)))
```

square_legal_moves – custom_score_3

Description: Returns the squared result of your available moves – opponents available moves
Reason: Wanted to test to see if doing so would improve the results of improve_score
Result: This heuristic test ended up worst then the original would not recommend.
Code:



```
own_moves = len(game.get_legal_moves(player))
opp_moves = len(game.get_legal_moves(game.get_opponent(player)))

return float((own_moves - opp_moves)**2)
```