

```

1  from time import time
2
3  class Game:
4      def __init__(self):
5          #initialized the empty tic tac toe board
6          self.current_state = [
7              ['.', '.', '.'],
8              ['.', '.', '.'],
9              ['.', '.', '.']
10         ]
11         self.result = None
12         self.player_turn = 'X'
13
14         #this functions prints the current state of the board/game
15         def print_board(self):
16             for i in range(3):
17                 for j in range(3):
18                     print(self.current_state[i][j], end="\t")
19                 print(end="\n\n")
20
21         def winner_is(self):
22             #for loop returns player if any player won either horizontally or
23             • vertically
24             for i in range(3):
25                 if self.current_state[i] == ['X', 'X', 'X']:
26                     return 'X'
27                 elif self.current_state[i] == ['O', 'O', 'O']:
28                     return 'O'
29                 •
30                 •
31                 elif self.current_state[0][i] != '.' and
32                     self.current_state[0][i] == self.current_state[1][i] ==
33                     self.current_state[2][i]:
34                     return self.current_state[0][i]
35
36             #this if condition returns the player if that player won
37             • diagonally
38             if self.current_state[1][1] != '.':
39                 if self.current_state[0][0] == self.current_state[1][1] ==
40                     self.current_state[2][2] or self.current_state[0][2] ==
41                     self.current_state[1][1] == self.current_state[2][0]:
42                     return self.current_state[1][1]
43
44             #this for loop returns None if game is not over yet (i.e if there
45             • are still empty places on board)
46             for i in range(3):
47                 for j in range(3):
48                     if self.current_state[i][j] == '.':
49                         return None
50
51             #if no one wins and board is also full, then we return T for Tie
52             return 'T'
53
54         def max(self):
55             max_value = -10
56             move_x = None

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48         move_y = None
49
50     winner = self.winner_is()
51     if winner == 'X':
52         return -10, 0, 0
53     elif winner == 'O':
54         return 10, 0, 0
55     elif winner == 'T':
56         return 0, 0, 0
57     elif winner == None:
58         for i in range(3):
59             for j in range(3):
60                 if self.current_state[i][j] == '.':
61                     self.current_state[i][j] = 'O'
62                     m, min_i, min_j = self.min()
63                     if m > max_value:
64                         max_value, move_x, move_y = m, i, j
65                     self.current_state[i][j] = '.'
66             return max_value, move_x, move_y
67
68     def min(self):
69         min_value = 10
70         move_x = None
71         move_y = None
72
73         winner = self.winner_is()
74         if winner == 'X':
75             return -10, 0, 0
76         elif winner == 'O':
77             return 10, 0, 0
78         elif winner == 'T':
79             return 0, 0, 0
80         elif winner == None:
81             for i in range(3):
82                 for j in range(3):
83                     if self.current_state[i][j] == '.':
84                         self.current_state[i][j] = 'X'
85                         m, max_i, max_j = self.max()
86                         if m < min_value:
87                             min_value, move_x, move_y = m, i, j
88                         self.current_state[i][j] = '.'
89             return min_value, move_x, move_y
90
91     def play(self):
92         while True:
93             self.print_board()
94             self.result = self.winner_is()
95             if self.result != None:
96                 if self.result == 'T':
97                     print('\n*** Game Tied ***\n')
98                 elif self.result == 'X':
99                     print('\n*** You Won... :( ***\n')
100                 elif self.result == 'O':
101                     print('*** I won... Now you have to take me to park

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101         : )
102         return
103
104     if self.player_turn == 'X':
105         start_time = time()
106         m, move_x, move_y = self.min()
107         print(f'Your Turn Hooman.. Don\'t boop\nRecommended move
    • : X = {move_x}, Y = {move_y}\t(Calculated in
    • {round(time()-start_time, 10)} seconds)')
108         while True:
109             user_move_x = int(input('Enter X : '))
110             user_move_y = int(input('Enter y : '))
111             if self.current_state[user_move_x][user_move_y] ==
    • '':
112                 self.current_state[user_move_x][user_move_y] = 'X'
113                 self.player_turn = 'O'
114                 break
115             else:
116                 print('Invalid Move... Use your eyes hooman')
117         else:
118             print('My turn now... let\'s think beep beep boop boop')
119             m, move_x, move_y = self.max()
120             self.current_state[move_x][move_y] = 'O'
121             print(f'I put my 0 on ({move_x}, {move_y})')
122             self.player_turn = 'X'
123
124     def main():
125         print('\nhey... hey hooman... let\'s play tic tac toe...')
126         print('You are X\n')
127         game = Game()
128         game.play()
129
130     main()
131
132     '''
133     Output: -
134
135     hey... hey hooman... let's play tic tac toe...
136     You are X
137
138     .      .      .
139
140     .      .      .
141
142     .      .      .
143
144     Your Turn Hooman.. Don't boop
145     Recommended move : X = 0, Y = 0 (Calculated in 1.5843901634 seconds)
146     Enter X : 0
147     Enter y : 0
148     X      .      .
149
150     .      .      .
151
152

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152 . . .
153
154 My turn now... let's think beep beep boop boop
155 I put my 0 on (1, 1)
156 X . .
157
158 . 0 .
159
160 . . .
161
162 Your Turn Hooman.. Don't boop
163 Recommended move : X = 0, Y = 1 (Calculated in 0.0234453678 seconds)
164 Enter X : 0
165 Enter y : 1
166 X X .
167
168 . 0 .
169
170 . . .
171
172 My turn now... let's think beep beep boop boop
173 I put my 0 on (0, 2)
174 X X 0
175
176 . 0 .
177
178 . . .
179
180 Your Turn Hooman.. Don't boop
181 Recommended move : X = 2, Y = 0 (Calculated in 0.0016555786 seconds)
182 Enter X : 1
183 Enter y : 0
184 X X 0
185
186 X 0 .
187
188 . . .
189
190 My turn now... let's think beep beep boop boop
191 I put my 0 on (2, 0)
192 X X 0
193
194 X 0 .
195
196 0 . .
197
198 *** I won... Now you have to take me to park :) ***
199 ' ' '
200

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