

Lab 7

Bushra dajam

2110054



OnlineGDB beta
online compiler and debugger for c/c++
code compile run debug share.

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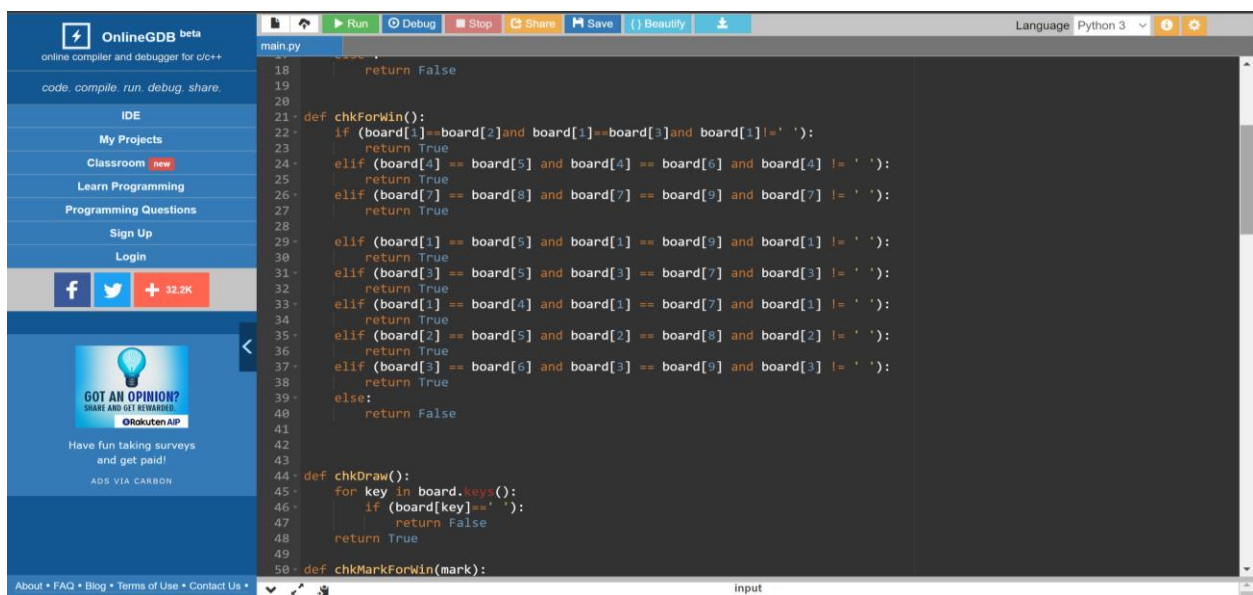
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ADS VIA CARBON

```
main.py
1 board={1:' ',2:' ',3:' ',
2         4:' ',5:' ',6:' ',
3         7:' ',8:' ',9:' '}
4
5 def printBoard(board):
6     print(board[1]+'|'+board[2]+'|'+board[3])
7     print('---')
8     print(board[4]+'|'+board[5]+'|'+board[6])
9     print('---')
10    print(board[7]+'|'+board[8]+'|'+board[9])
11    print('\n')
12
13 def spaceIsFree(position):
14     if board[position]==' ':
15         return True
16     else:
17         return False
18
19
20
21 def chkForWin():
22     if (board[1]==board[2] and board[1]==board[3] and board[1]!=' '):
23         return True
24     elif (board[4]==board[5] and board[4]==board[6] and board[4]!=' '):
25         return True
26     elif (board[7]==board[8] and board[7]==board[9] and board[7]!=' '):
27         return True
28
29     elif (board[1]==board[5] and board[1]==board[9] and board[1]!=' '):
30         return True
31     elif (board[3]==board[5] and board[3]==board[7] and board[3]!=' '):
32         return True
33     elif (board[1]==board[4] and board[1]==board[7] and board[1]!=' '):
```

Language Python 3

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```

34         return True
35     elif (board[2]==board[5] and board[2]==board[8] and board[2]!=' '):
36         return True
37     elif (board[3]==board[6] and board[3]==board[9] and board[3]!=' '):
38         return True
39     else:
40         return False
41
42
43 def chkDraw():
44     for key in board.keys():
45         if (board[key]!=' '):
46             return False
47     return True
48
49
50 def chkMarkForWin(mark):
```

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main.py

```
39- else:
40-     return False
41-
42-
43-
44- def chkDraw():
45-     for key in board.keys():
46-         if (board[key]!=' '):
47-             return False
48-         return True
49-
50- def chkMarkForWin(mark):
51-     if (board[1]==board[2]and board[1]==board[3]and board[1]==mark):
52-         return True
53-     elif (board[4] == board[5] and board[4] == board[6] and board[4] ==mark):
54-         return True
55-     elif (board[7] == board[8] and board[7] == board[9] and board[7] ==mark):
56-         return True
57-
58-     elif (board[1] == board[5] and board[1] == board[9] and board[1] ==mark):
59-         return True
60-     elif (board[3] == board[5] and board[3] == board[7] and board[3] ==mark):
61-         return True
62-     elif (board[1] == board[4] and board[1] == board[7] and board[1] ==mark):
63-         return True
64-     elif (board[2] == board[5] and board[2] == board[8] and board[2] ==mark):
65-         return True
66-     elif (board[3] == board[6] and board[3] == board[9] and board[3] ==mark):
67-         return True
68-     else:
69-         return False
70-
71-
```

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main.py

```
69-     return False
70-
71-
72- def insertLetter(letter,position):
73-     if (spaceIsFree(position)):
74-         board[position]=letter
75-         printBoard(board)
76-
77-         if (chkDraw()):
78-             print('Draw !')
79-         elif(chkForWin()):
80-             if (letter=='X'):
81-                 print('you wins!')
82-             else:
83-                 print('bot win!')
84-             return
85-
86-     else:
87-         print('position taken,please pick a different position. ')
88-         position=int(input('Enter new Position: '))
89-         insertLetter(letter,position)
90-         return
91-
92- player='X'
93- bot='O'
94-
95- def playerMove():
96-     position = int(input('Enter new Position for X: '))
97-     insertLetter(player, position)
98-     return
99-
100- def compMove():
101-     bestScore=-1000
102-     bestMove=0
103-
104-     for i in range(0,9):
105-         if (board[i]!=' '):
106-             continue
107-         board[i]=player
108-         score=-1000
109-         if (chkForWin()):
110-             score=1000
111-         else:
112-             score=compMove()
113-         board[i]=bot
114-         if (score>bestScore):
115-             bestScore=score
116-             bestMove=i
117-     board[bestMove]=player
118-     return bestMove
119-
120- def main():
121-     print('Welcome to Tic Tac Toe')
122-     printBoard(board)
123-     while (True):
124-         playerMove()
125-         compMove()
126-         printBoard(board)
127-         if (chkForWin()):
128-             print('Game Over')
129-             break
130-         if (chkDraw()):
131-             print('Game Over')
132-             break
133-
134- if __name__ == '__main__':
135-     main()
136-
```

input

...Program finished with exit code 0
Press ENTER to exit console.

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main.py
99
100 def compMove():
101 bestScore=-1000
102 bestMove=0
103
104 for key in board.keys():
105 if(board[key]!=' '):
106 board[key]=bot
107 score=minimax(board,0,False)
108 board[key]=' '
109 if (score>bestScore):
110 bestScore=score
111 bestMove=key
112
113 insertLetter(bot,bestMove)
114 return
115
116 def minimax(board,depth,isMaximizing):
117 if (chkMarkForWin(bot)):
118 return 1
119 elif(chkMarkForWin(player)):
120 return -1
121 elif(chkDraw()):
122 return 0
123
124 if isMaximizing:
125 bestScore=-1000
126 for key in board.keys():
127 if board[key]!=' ':
128 board[key]=bot
129 score=minimax(board,0,False)
130 board[key]=' '
131 if (score>bestScore):

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main.py
114 return
115
116 def minimax(board,depth,isMaximizing):
117 if (chkMarkForWin(bot)):
118 return 1
119 elif(chkMarkForWin(player)):
120 return -1
121 elif(chkDraw()):
122 return 0
123
124 if isMaximizing:
125 bestScore=-1000
126 for key in board.keys():
127 if board[key]!=' ':
128 board[key]=bot
129 score=minimax(board,0,False)
130 board[key]=' '
131 if (score>bestScore):
132 bestScore=score
133 return bestScore
134 else:
135 bestScore = 1000
136 for key in board.keys():
137 if board[key] == ' ':
138 board[key] = player
139 score = minimax(board, 0, True)
140 board[key] = ' '
141 if (score < bestScore):
142 bestScore = score
143 return bestScore
144
145
146 while not chkForWin():
Program finished with exit code 0

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main.py

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```
def chkMarkForWin(player):  
    return 1  
elif(chkMarkForWin(player)):  
    return -1  
elif(chkDraw()):  
    return 0  
  
if isMaximizing:  
    bestScore=-1000  
    for key in board.keys():  
        if board[key]==' ':  
            board[key]=bot  
            score=minimax(board,0,False)  
            board[key]=' '  
            if (score>bestScore):  
                bestScore=score  
    return bestScore  
else:  
    bestScore = 1000  
    for key in board.keys():  
        if board[key] == ' ':  
            board[key] = player  
            score = minimax(board, 0, True)  
            board[key] = ' '  
            if (score < bestScore):  
                bestScore = score  
    return bestScore  
  
while not chkForWin():  
    compMove()  
    if(not chkForWin()):  
        playerMove()
```

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input

Output:

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input

0 | |
+--+
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+--+
| |


Enter new Position for X: 3
0 | |X
+--+
| |
+--+
| |

0 | |X
+--+
| |
+--+
| |

Enter new Position for X: 7
0 | |X
+--+
| |
+--+
X | |

0 | |X
+--+
| |
+--+
0 | 0 |
+--+
X | |

Enter new Position for X: 6

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Debug



Stop

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main.py

Enter new Position for X: 7
O| IX
-+-
O| I
-+-
X| I

Enter new Position for X: 6
O| IX
-+-
O|O|X
-+-
X| I

O| IX
-+-
O|O|X
-+-
X| IO

bot win!

...Program finished with exit code 0
Press ENTER to exit console.