```
 1
 2 def printBoard(board):
 3     print(board[1]+ '|' + board[2] + '|' + board[3])
 4     print('-+-+-')
 5     print(board[4] + '|' + board[5] + '|' + board[6])
 6     print('-+-+-')
 7     print(board[7] + '|' + board[8] + '|' + board[9])
 8     print('-+-+-')
 9     print("\n")
10 board = {1: ' ', 2: ' ', 3: ' ',
11          4: ' ', 5: ' ', 6: ' ',
12          7: ' ', 8: ' ', 9: ' ', }
13 printBoard(board)
14 print("Computer goes first! Good luck.")
15 print("Positions are as follow:")
16 print("1, 2, 3 ")
17 print("4, 5, 6 ")
18 print("7, 8, 9 ")
19 print("\n")
20 player = 'O'
21 bot = 'X'
22
23
24 def spaceIsFree(position):
25
26     if(board[position]== ' '):
27         return True
28     else:
29         return False
30 def insterLetter(letter,position):
31
32     if spaceIsFree(position):
33         board[position]= letter
34         printBoard(board)
35         if(checkDraw()):
36             print("Draw!")
37             exit()
38
39         if checkForWin():
40             if letter == 'X':
41                 print("Bot wins!")
```

```
42                  exit()
43              else:
44                  print("Player wins!")
45                  exit()
46          return
47
48      else:
49          print("Can't insert there!")
50          position = int(input("Enter new position: "))
51          insterLetter(letter,position)
52          return
53  #print(spaceIsFree(5))
54
55
56
57  def checkForWin():
58      if (board[1] == board[2] and board[1] == board[3
    ] and board[1] != ' '):
59          return True
60      elif (board[4] == board[5] and board[4] == board[
    6] and board[4] != ' '):
61          return True
62      elif (board[7] == board[8] and board[7] == board[
    9] and board[7] != ' '):
63          return True
64      elif (board[1] == board[4] and board[1] == board[
    7] and board[1] != ' '):
65          return True
66      elif (board[2] == board[5] and board[2] == board[
    8] and board[2] != ' '):
67          return True
68      elif (board[3] == board[6] and board[3] == board[
    9] and board[3] != ' '):
69          return True
70      elif (board[1] == board[5] and board[1] == board[
    9] and board[1] != ' '):
71          return True
72      elif (board[7] == board[5] and board[7] == board[
    3] and board[7] != ' '):
73          return True
74      else:
```

```
 75         return False
 76
 77 def checkWhichMarkWon (mark):
 78         if (board[1] == board[2] and board[1] ==
    board[3] and board[1] == mark):
 79             return True
 80         elif (board[4] == board[5] and board[4] ==
    board[6] and board[4] == mark):
 81             return True
 82         elif (board[7] == board[8] and board[7] ==
    board[9] and board[7] == mark):
 83             return True
 84         elif (board[1] == board[4] and board[1] ==
    board[7] and board[1] == mark):
 85             return True
 86         elif (board[2] == board[5] and board[2] ==
    board[8] and board[2] == mark):
 87             return True
 88         elif (board[3] == board[6] and board[3] ==
    board[9] and board[3] == mark):
 89             return True
 90         elif (board[1] == board[5] and board[1] ==
    board[9] and board[1] == mark):
 91             return True
 92         elif (board[7] == board[5] and board[7] ==
    board[3] and board[7] == mark):
 93             return True
 94         else:return False
 95
 96 def checkDraw():
 97     for key in board.keys():
 98         if board[key] == ' ':
 99             return False
100     else:
101       return True
102
103
104 def playerMove():
105     position = int(input("Enter the position for '0
    ': "))
106     insterLetter(player, position)
```

```
107     return
108 
109 def compMove():
110     bestScore = -800
111     bestMove=0
112 
113     for key in board.keys():
114         if(board[key]== ' '):
115             board[key] = bot
116             score = minimax(board,0,False)
117             board[key] = ' '
118             if(score>bestScore):
119                 bestScore = score
120                 bestMove = key
121 
122 
123     insterLetter(bot,bestMove)
124     return
125 
126 
127 
128 def minimax(board, depth , isMaximizing):
129 
130     if (checkWhichMarkWon(bot)):
131         return 1
132     elif (checkWhichMarkWon(player)):
133         return -1
134     elif checkDraw():
135         return 0
136     if (isMaximizing):
137         bestScore = -800
138 
139 
140         for key in board.keys():
141             if (board[key] == ' '):
142                 board[key] = bot
143                 score = minimax(board,depth +1 ,
    False)
144                 board[key] = ' '
145                 if (score > bestScore):
146                     bestScore = score
```

```
147
148         return bestScore
149
150     else:
151         bestScore = 800
152
153         for key in board.keys():
154             if (board[key] == ' '):
155                 board[key] = bot
156                 score = minimax(board, depth +1,
    True)
157                 board[key] = ' '
158                 if (score < bestScore):
159                     bestScore = score
160
161         return bestScore
162
163
164 while not checkForWin():
165     compMove()
166     playerMove()
167
```