4/10/23

Lab Program - 7

Tic Tac-Toe

```
board = { 1:' ', 2:' ', 3:' ',
          4:' ', 5:' ', 6:' ',
          7:' ', 8:' ', 9:' ' }

def printBoard (board):
    print ( board[1] + '|' + board[2] + '|' +
            board[3] )
    print ('-+-+-')
    print ( board[4] + '|' + board[5] + '|' + board[6])
    print ('-+-+-')
    print ( board[7] + '|' + board[8] + '|' + board[9] )
    print ('\n')

def spaceFree (pos):
    if (board[pos] == ' '):
        return True
    else:
        return False

def checkwin ():
    if (board[1] == board[2] and board[1] == board[3] and
        board[1] != ' '):
        return True
    elif (board[4] == board[5] and board[4] == board[6] and
          board[4] != ' '):
        return True
    elif ( board[7] == board[8] and board[7] == board[9]
           and board[7] != ' '):
        return True
```

```
            elif (checkWin()):
                if (letter == 'X'):
                    print ('Bot wins')
                else:
                    print ('You win!')
                return
        else:
            print ("position Taken")
            position = int (input ("Enter new pos"))
            insertLetter (letter, position)
            return

player = 'O'
bot = 'X'

def playerMove():
    position = int (input ('Enter new pos'))
    insertLetter (letter, position)
    return

def compMove():
    bestScore = -1000
    bestMove = 0
    for key in board.keys():
        if (board[key] == ' '):
            board[key] = bot
            score = minimax (board, False)
            board[key] = ' '
            if (score > bestScore):
                bestScore = score
                bestmove = key
    insertLetter (bot, bestmove)
    return
```

```
def minimax( board, ismax ):
    if ( checkMoveForWin (bot) ):
        return 1
    elif ( checkMoveForWin (player) ):
        return -1
    elif ( checkDraw() ):
        return 0

if isMax:
    bestScore = -1000
    for key in board.keys():
        if board[key] == ' ':
            board[key] = bot
            score = minimax (board, 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, true)
            board[key] = ' '
            if ( scr < bestScore ):
                bestScore = score
    return bestScore

while not checkWin():
    compMove()
    playerMove()
```