AI lab-1
Tik tac toe - program

```
import random as r
ai,player='O','X'
board=[['_','_','_'],['_','_','_'],['_','_','_']]
weights=[[3,2,3],[2,4,2],[3,2,3]]
def init():
    global ai,player,board,weights
    ai,player='O','X'
    board=[['_','_','_'],['_','_','_'],['_','_','_']]
    weights=[[3,2,3],[2,4,2],[3,2,3]]
def move(row,col,ch):
    if board[row][col]=='_':
        board[row][col],weights[row][col]=ch,0
        return True
    else : return False

def display(move_type='board'):
    if move_type=='cpu' : print('*'*5+'CPU
MOVE'+'*'*5)
    elif move_type=='board': print("*"*5+'
Board of Tic Tac Toe '+'*'*5)
    else :print('*'*5+'PLAYER MOVE'+'*'*5)
    for i in range(3):
```

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            print(board[i][j],end='\t')
        print('\n')
    print('\n')

def compare_line(s1,ch):
    return '_' in s1 and s1.count(ch)==2

def get_position():
    max_value=max([max(x) for x in weights])
    positions=[(i,weights[i].index(max_value))
for i in range(3)  if max_value in weights[i]]
    return positions

def has_tied():
    for row in board:
      if '_' in row: return False
    return True

def attacking_positiion(ch):
        default='_'
        for i in range(3):
            col=[board[0][i],board[1][i],board[2][i]]
            if compare_line(board[i],ch): return
(i,board[i].index(default))
            elif compare_line(col,ch): return
```

```
(col.index(default),i)
        diag1,diag2=[board[0][0],board[1]
[1],board[2][2]],[board[0][2],board[1]
[1],board[2][0]]
        if compare_line(diag1,ch):return
(diag1.index(default),diag1.index(default))
        elif compare_line(diag2,ch): return
(diag2.index(default),2-diag2.index(default))
        return False

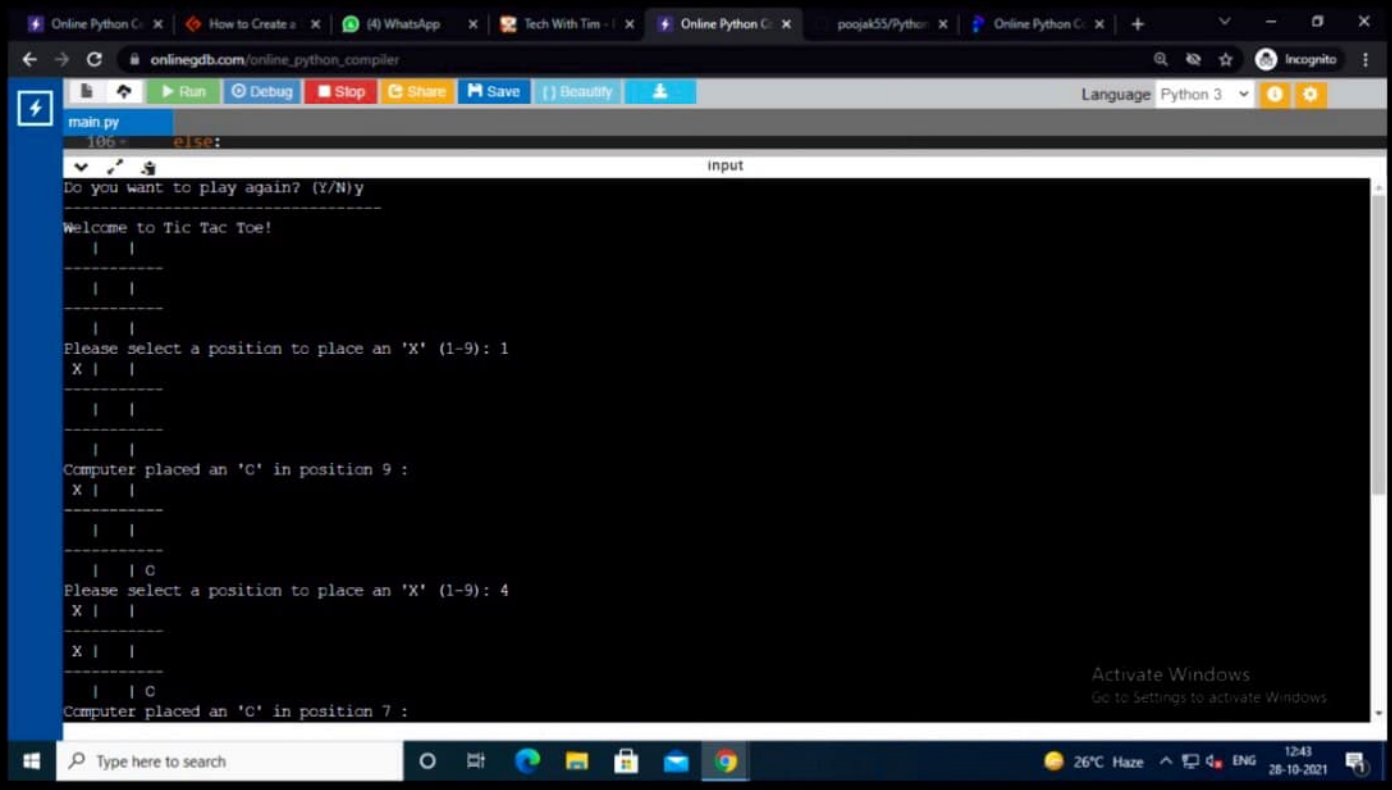
def ai_move():
    global ai,player
    pos,f=attacking_positiion(ch=ai),False
    if pos!=False:(row,col),f=pos,True
    else :
        pos=attacking_positiion(ch=player)
        if pos!=False: row,col=pos
        else: row,col=r.choice(get_position())
    move(row,col,ai)
    return f

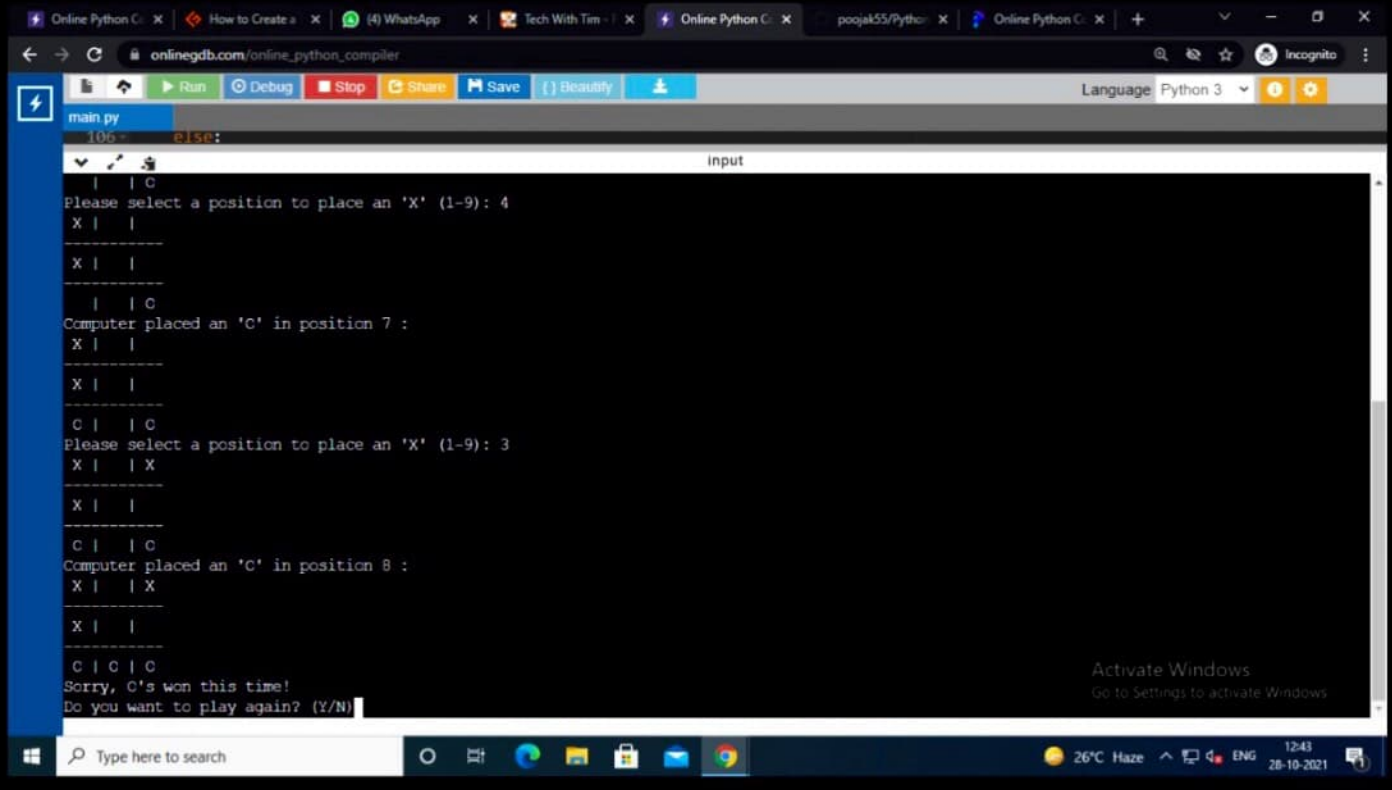
def run():
    global ai,player
    end,tied,move_type=False,False,None
    print('*'*10+ 'Tic Tac Toe'+'*'*10+'\n')
```

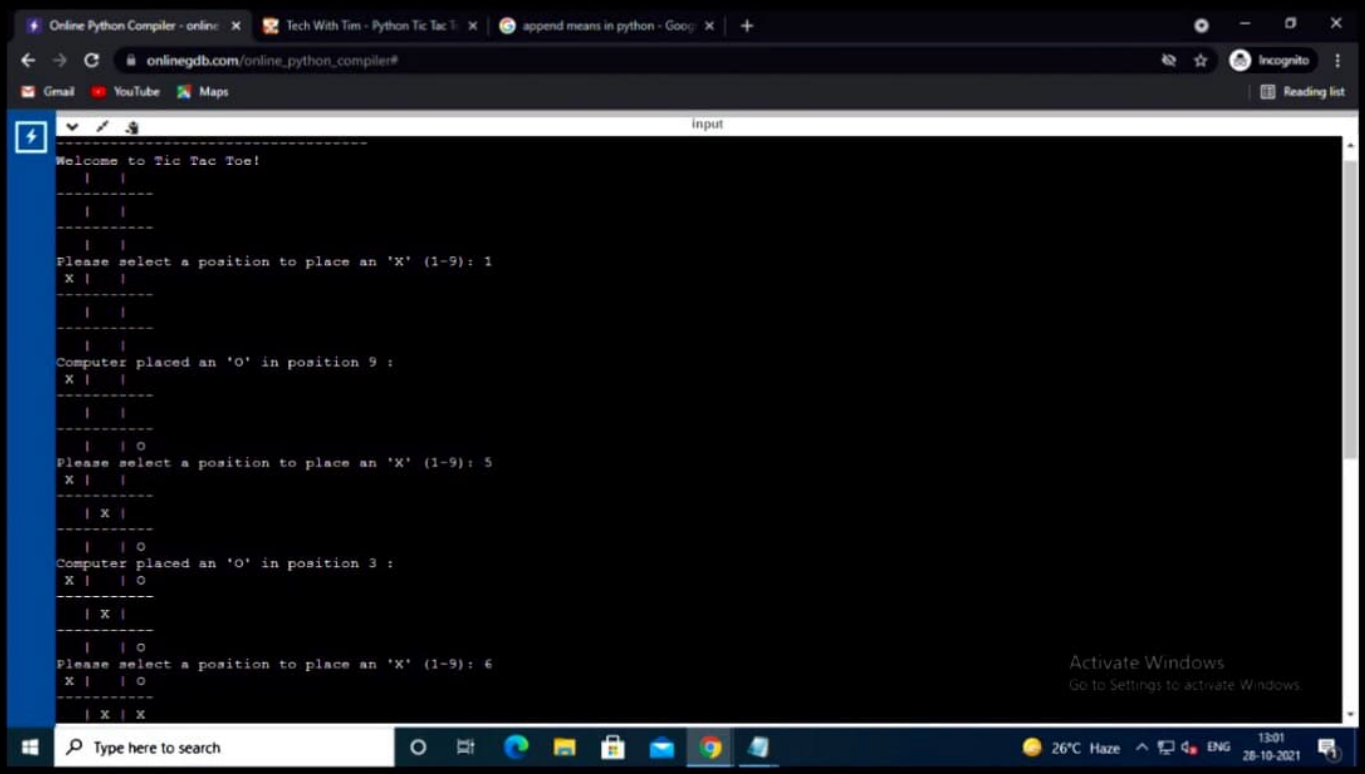
```
    display()
    ch=input('Choose a Character X or O : ')
    if ch=='O': ai,player=player,ai
    while(True):
        if tied:
            print('*'*10+'The match is tied'+'*'*10)
            return
        elif end:
            print('*'*10+move_type+' has own
'+'*'*10)
            return
        move_type='player'
        r=int(input("\nEnter next move's row (1 to
3): "))
        c=int(input("Enter next move's column (1
to 3): "))
        if not move(r-1,c-1,player):
            print('\nEnter proper positions!!')
        else:
          display(move_type=move_type)
          tied=has_tied()
          if tied: continue
          move_type='cpu'
          end=ai_move()
          display(move_type=move_type)
```

```
        c=int(input("Enter next move's column (1
to 3): "))
        if not move(r-1,c-1,player):
            print('\nEnter proper positions!!')
        else:
          display(move_type=move_type)
          tied=has_tied()
          if tied: continue
          move_type='cpu'
          end=ai_move()
          display(move_type=move_type)
          tied=has_tied()
def main():
    run()
    f='Y'
    while(f=='Y'or f=='y'):
        f=input('Do you want to play again Y or N:
')
        init()
        if f=='Y' or f=='y':run()
    print('\n\n'+'*'*10+' Thank You '+'*'*10)
main()
```

Output:


onlinegdb.com/online_python_compiler
Run
Debug
Stop
Share
Save
{ } Beautify
Language Python 3
main.py
106 else:
input
Do you want to play again? (Y/N)y
Welcome to Tic Tac Toe!
Please select a position to place an 'X' (1-9): 1
Computer placed an 'C' in position 9 :
Please select a position to place an 'X' (1-9): 4
Computer placed an 'C' in position 7 :
Activate Windows
Type here to search
26°C Haze
ENG
12:43
28-10-2021


onlinegdb.com/online_python_compiler
Run
Debug
Stop
Share
Save
{ } Beautify
Language Python 3
main.py
106 else:
input
Please select a position to place an 'X' (1-9): 4
Computer placed an 'C' in position 7 :
Please select a position to place an 'X' (1-9): 3
Computer placed an 'C' in position 8 :
Sorry, C's won this time!
Do you want to play again? (Y/N)
Activate Windows
Type here to search
26°C Haze
ENG
12:43
28-10-2021


Online Python Compiler - online
Tech With Tim - Python Tic Tac T
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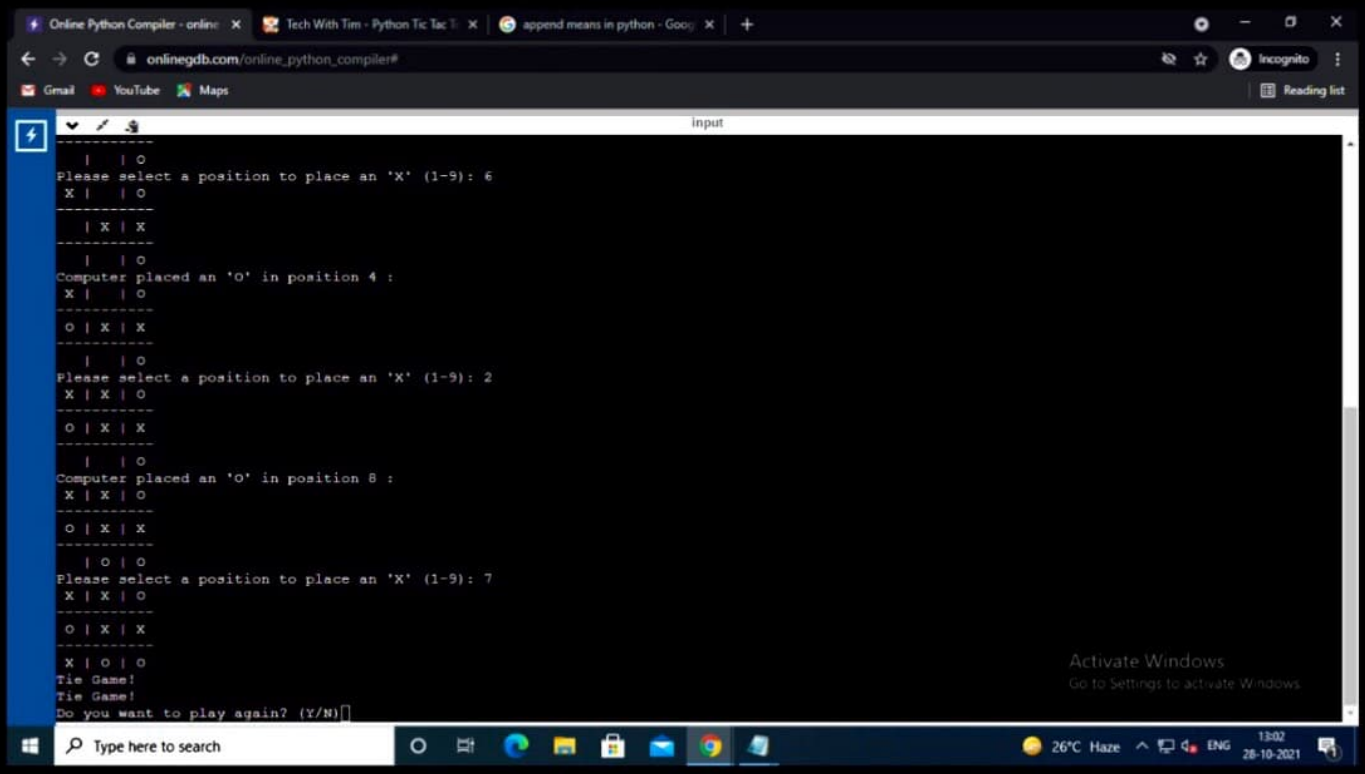
onlinegdb.com/online_python_compiler#
Incognito
Gmail
YouTube
Maps
Reading list
input
Welcome to Tic Tac Toe!
Please select a position to place an 'X' (1-9): 1
Computer placed an 'O' in position 9 :
Please select a position to place an 'X' (1-9): 5
Computer placed an 'O' in position 3 :
Please select a position to place an 'X' (1-9): 6
Activate Windows
Go to Settings to activate Windows.
Type here to search
26°C Haze
ENG
13:01
28-10-2021


Online Python Compiler - online
Tech With Tim - Python Tic Tac T
append means in python - Goog
onlinegdb.com/online_python_compiler#
Incognito
Gmail
YouTube
Maps
Reading list
input
Please select a position to place an 'X' (1-9): 6
Computer placed an 'O' in position 4 :
Please select a position to place an 'X' (1-9): 2
Computer placed an 'O' in position 8 :
Please select a position to place an 'X' (1-9): 7
Tie Game!
Tie Game!
Do you want to play again? (Y/N)
Activate Windows
Go to Settings to activate Windows.
Type here to search
26°C Haze
ENG
13:02
28-10-2021