EXPERRIMENT – 12 Tic-Tac-Toe (console, human vs AI with minimax)

AIM:

Play Tic-Tac-Toe; AI uses minimax.

CODE:

# ttt\_minimax.py

import math

def printb(b):

for i in range(0,9,3): print(b[i:i+3])

def winner(b):

wins=[(0,1,2),(3,4,5),(6,7,8),(0,3,6),(1,4,7),(2,5,8),(0,4,8),(2,4,6)]

for a,b2,c in wins:

if b[a]==b[b2]==b[c] and b[a]!=" ": return b[a]

if " " not in b: return 'Tie'

return None

def minimax(b,player):

w=winner(b)

if w=='X': return (1,None)

if w=='O': return (-1,None)

if w=='Tie': return (0,None)

moves=[]

for i in range(9):

if b[i]==" ":

nb=b.copy(); nb[i]=player

score,\_=minimax(nb,'O' if player=='X' else 'X')

moves.append((score,i))

if player=='X':

return max(moves)

else:

return min(moves)

def play():

board=[" "]\*9

human='O'; ai='X'

while True:

printb(board);

if winner(board): break

# human move

pos=int(input("Your move (0-8): "))

if board[pos]!=" ": continue

board[pos]=human

if winner(board): break

# ai move

\_,i=minimax(board,ai)

board[i]=ai

print("Result:",winner(board)); printb(board)

if \_\_name\_\_=='\_\_main\_\_':

play()

OUTPUT:

