1. **Task(TIC-TAC-TOE AI)**

import math

# Constants

HUMAN = 'O'

AI = 'X'

EMPTY = ' '

# Initial empty board

board = [EMPTY for \_ in range(9)]

# Print the board

def print\_board():

for i in range(3):

print('|'.join(board[i\*3:(i+1)\*3]))

if i < 2:

print('-'\*5)

# Check win condition

def check\_winner(brd, player):

win\_cond = [

[0,1,2], [3,4,5], [6,7,8], # rows

[0,3,6], [1,4,7], [2,5,8], # columns

[0,4,8], [2,4,6] # diagonals

]

return any(all(brd[i] == player for i in combo) for combo in win\_cond)

# Check for draw

def is\_draw(brd):

return EMPTY not in brd and not check\_winner(brd, HUMAN) and not check\_winner(brd, AI)

# Minimax algorithm

def minimax(brd, is\_maximizing):

if check\_winner(brd, AI):

return 1

elif check\_winner(brd, HUMAN):

return -1

elif is\_draw(brd):

return 0

if is\_maximizing:

best\_score = -math.inf

for i in range(9):

if brd[i] == EMPTY:

brd[i] = AI

score = minimax(brd, False)

brd[i] = EMPTY

best\_score = max(score, best\_score)

return best\_score

else:

best\_score = math.inf

for i in range(9):

if brd[i] == EMPTY:

brd[i] = HUMAN

score = minimax(brd, True)

brd[i] = EMPTY

best\_score = min(score, best\_score)

return best\_score

# AI picks the best move

def best\_move():

best\_score = -math.inf

move = -1

for i in range(9):

if board[i] == EMPTY:

board[i] = AI

score = minimax(board, False)

board[i] = EMPTY

if score > best\_score:

best\_score = score

move = i

return move

# Game play loop

def play():

print("\nWelcome to Tic-Tac-Toe!")

print("You are 'O' and AI is 'X'")

print("Position guide:")

print("0 | 1 | 2")

print("---------")

print("3 | 4 | 5")

print("---------")

print("6 | 7 | 8\n")

print\_board()

while True:

try:

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

if board[move] != EMPTY:

print("Invalid move. Spot already taken.")

continue

except:

print("Please enter a number between 0 and 8.")

continue

board[move] = HUMAN

print\_board()

if check\_winner(board, HUMAN):

print("🎉 You win!")

break

if is\_draw(board):

print("It's a draw!")

break

print("AI is making a move...")

ai = best\_move()

board[ai] = AI

print\_board()

if check\_winner(board, AI):

print("💻 AI wins!")

break

if is\_draw(board):

print("It's a draw!")

break

if \_name\_ == "\_main\_":

play()