**Exp :13 Write the python program to implement Minimax algorithm for gaming.**

**Input:**

import math

def print\_board(b):

    for row in b: print(" | ".join(row)); print("-"\*5)

def winner(b):

    lines = b + [list(c) for c in zip(\*b)] + [[b[i][i] for i in range(3)], [b[i][2-i] for i in range(3)]]

    for line in lines:

        if line[0] != " " and all(c == line[0] for c in line): return line[0]

    return None

def full(b): return all(c != " " for r in b for c in r)

def minimax(b, is\_max):

    win = winner(b)

    if win == "O": return 1

    if win == "X": return -1

    if full(b): return 0

    best = -math.inf if is\_max else math.inf

    for i in range(3):

        for j in range(3):

            if b[i][j] == " ":

                b[i][j] = "O" if is\_max else "X"

                val = minimax(b, not is\_max)

                b[i][j] = " "

                best = max(best, val) if is\_max else min(best, val)

    return best

def best\_move(b):

    move, best = None, -math.inf

    for i in range(3):

        for j in range(3):

            if b[i][j] == " ":

                b[i][j] = "O"

                score = minimax(b, False)

                b[i][j] = " "

                if score > best: best, move = score, (i, j)

    return move

def get\_player\_move(b):

    while True:

        try:

            r = int(input("Row (0-2): "))

            c = int(input("Col (0-2): "))

            if 0 <= r < 3 and 0 <= c < 3 and b[r][c] == " ":

                return r, c

            else:

                print("Invalid move! Try again.")

        except ValueError:

            print("Please enter valid integers.")

def game():

    b = [[" "]\*3 for \_ in range(3)]

    print("You: X | AI: O")

    while True:

        print\_board(b)

        if winner(b) or full(b): break

        r, c = get\_player\_move(b)

        b[r][c] = "X"

        if winner(b) or full(b): break

        m = best\_move(b)

        if m: b[m[0]][m[1]] = "O"

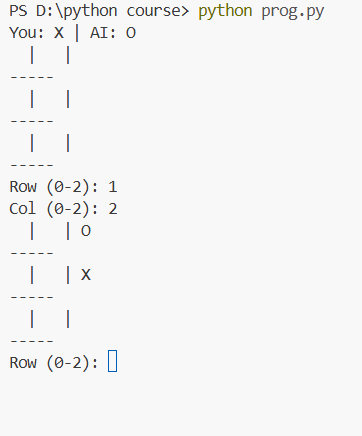
    print\_board(b)

    w = winner(b)

    print("Draw!" if not w else f"{w} wins!")

game()

**Output:**

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