**TASK 1:**

**Apply minimax algorithm to make decision in tic tac toe game.**

**CODE:**

*# Owned*

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*#===============================================================*

*# {code}*

*def* *ConstBoard*(board):

    print("Current State Of Board : \n\n")***;***

*for* i *in* range (0,9):

*if*((i*>*0) *and* (i*%*3)*==*0):

            print("\n")***;***

*if*(board[i]*==*0):

            print("- ",end*=*" ")***;***

*if* (board[i]*==*1):

            print("O ",end*=*" ")***;***

*if*(board[i]*==-*1):

            print("X ",end*=*" ")***;***

    print("\n\n")***;***

*def* *User1Turn*(board):

    pos*=*input("Enter X's position from [1...9]: ")***;***

    pos*=*int(pos)***;***

*if*(board[pos*-*1]*!=*0):

        print("Wrong Move!!!")***;***

        exit(0) ***;***

    board[pos*-*1]*=-*1***;***

*def* *User2Turn*(board):

    pos*=*input("Enter O's position from [1...9]: ")***;***

    pos*=*int(pos)***;***

*if*(board[pos*-*1]*!=*0):

        print("Wrong Move!!!")***;***

        exit(0)***;***

    board[pos*-*1]*=*1***;***

*def* *minimax*(board,player):

    x*=*analyzeboard(board)***;***

*if*(x*!=*0):

*return* (x*\**player)***;***

    pos*=-*1***;***

    value*=-*2***;***

*for* i *in* range(0,9):

*if*(board[i]*==*0):

            board[i]*=*player***;***

            score*=-*minimax(board,(player*\*-*1))***;***

*if*(score*>*value):

                value*=*score***;***

                pos*=*i***;***

            board[i]*=*0***;***

*if*(pos*==-*1):

*return* 0***;***

*return* value***;***

*def* *CompTurn*(board):

    pos*=-*1***;***

    value*=-*2***;***

*for* i *in* range(0,9):

*if*(board[i]*==*0):

            board[i]*=*1***;***

            score*=-*minimax(board, *-*1)***;***

            board[i]*=*0***;***

*if*(score*>*value):

                value*=*score***;***

                pos*=*i***;***

    board[pos]*=*1***;***

*def* *analyzeboard*(board):

    cb*=*[[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* i *in* range(0,8):

*if*(board[cb[i][0]] *!=* 0 *and*

           board[cb[i][0]] *==* board[cb[i][1]] *and*

           board[cb[i][0]] *==* board[cb[i][2]]):

*return* board[cb[i][2]]***;***

*return* 0***;***

*def* *main*():

    choice*=*input("Enter 1 for single player, 2 for multiplayer: ")***;***

    choice*=*int(choice)***;***

    board*=*[0,0,0,0,0,0,0,0,0]***;***

*if*(choice*==*1):

        print("Computer : O Vs. You : X")***;***

        player*=* input("Enter to play 1(st) or 2(nd) :")***;***

        player *=* int(player)***;***

*for* i *in* range (0,9):

*if*(analyzeboard(board)*!=*0):

*break****;***

*if*((i*+*player)*%*2*==*0):

                CompTurn(board)***;***

*else*:

                ConstBoard(board)***;***

                User1Turn(board)***;***

*else*:

*for* i *in* range (0,9):

*if*(analyzeboard(board)*!=*0):

*break****;***

*if*((i)*%*2*==*0):

                ConstBoard(board)***;***

                User1Turn(board)***;***

*else*:

                ConstBoard(board)***;***

                User2Turn(board)***;***

    x*=*analyzeboard(board)***;***

*if*(x*==*0):

         ConstBoard(board)***;***

         print("Draw!!!")

*if*(x*==-*1):

         ConstBoard(board)***;***

         print("X Wins!!! Y Loose !!!")

*if*(x*==*1):

         ConstBoard(board)***;***

         print("X Loose!!! O Wins !!!!")

main()

**OUTPUT:**





