**TASK 1:**

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

**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 !!!")

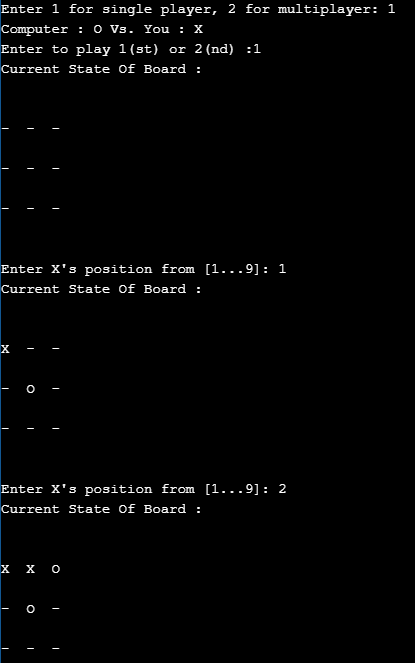
    if(x==1):

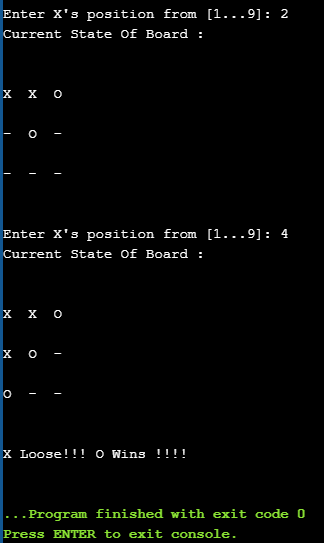
         ConstBoard(board);

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

main()

**OUTPUT:**

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