AI

LAB-4

QUESTION:

Lab-4Problem Implement and Demonstrate N-Queen Problem using backtracking in Java/ Python:

CODE:

```java
public class NQP {

    final int N = 4;

    void printSolution(int board[][])
    {
        System.out.println("**************MAJJIGA
JASWANTH/n20bcd7171***************");
        for (int i = 0; i < N; i++) {
            for (int j = 0; j < N; j++)
                System.out.print(" " + board[i][j]
                                                + " ");
            System.out.println();
        }
    }
    boolean isSafe(int board[][], int row, int col)
    {
        int i, j;
        for (i = 0; i < col; i++)
            if (board[row][i] == 1)
                return false;
        for (i = row, j = col; i >= 0 && j >= 0; i--, j--)
            if (board[i][j] == 1)
                return false;
```

```
        for (i = row, j = col; j >= 0 && i < N; i++, j--)
                if (board[i][j] == 1)
                        return false;

        return true;
    }


    boolean NQueenUtil(int board[][], int col)
    {
        if (col >= N)
                return true;
        for (int i = 0; i < N; i++) {
                if (isSafe(board, i, col)) {
                        board[i][col] = 1;
                        if (NQueenUtil(board, col + 1) == true)
                                return true;
                        board[i][col] = 0;
                }
        }
        return false;
    }
    boolean NQueen()
    {
        int board[][] = { { 0, 0, 0, 0 },
                          { 0, 0, 0, 0 },
                          { 0, 0, 0, 0 },
                          { 0, 0, 0, 0 } };
```

```
        if (NQueenUtil(board, 0) == false) {

                System.out.print("Sorry!! no solution exist :-( ");

                return false;

        }

        printSolution(board);

        return true;

    }


    public static void main(String args[])

    {

            NQP Queen = new NQP();

            Queen.NQueen();

    }

}
```

OUTPUT:

```
Microsoft Windows [Version 10.0.22000.194]
(c) Microsoft Corporation. All rights reserved.

C:\Users\MAJJIGA JASWANTH>cd desktop

C:\Users\MAJJIGA JASWANTH\Desktop>cd java

C:\Users\MAJJIGA JASWANTH\Desktop\java>javac NQP.java

C:\Users\MAJJIGA JASWANTH\Desktop\java>java NQP
**************MAJJIGA JASWANTH/n20bcd7171***************
 0  0  1  0
 1  0  0  0
 0  0  0  1
 0  1  0  0

C:\Users\MAJJIGA JASWANTH\Desktop\java>
```