

Experiment No: 10

Name: Aniket Balendra Tiwari

Roll No: 21143285

Program:

Implement 8-queens problem using backtracking

```
#include <bits/stdc++.h>

#define N 8

using namespace std;

void printSolution(int board[N][N])
{
    for (int i = 0; i < N; i++) {
        for (int j = 0; j < N; j++)
            cout << " " << board[i][j] << " ";
        printf("\n");
    }
}

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

```
        return true;
    }

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

```
bool solveNQ()
{
    int board[N][N] = { 0 };
    if (solveNQUtil(board, 0) == false) {
        cout << "Solution does not exist";
        return false;
    }
    printSolution(board);
    return true;
}
```

```
int main()
```

```
{  
    cout << "Name : Aniket Tiwari\n";  
    cout << "Roll No : 21143285\n\n";  
    solveNQ();  
    return 0;  
}
```

Output:

```
PROBLEMS  OUTPUT  TERMINAL  JUPYTER  DEBUG CONSOLE  
  
Microsoft Windows [Version 10.0.22621.521]  
(c) Microsoft Corporation. All rights reserved.  
  
D:\Programming\College Experiments\TY 5 Sem\DAA Lab>cd "d:\Programming\College Experiments\TY 5 Sem\DAA Lab\8Queens"  
Name : Aniket Tiwari  
Roll No : 21143285  
  
1 0 0 0 0 0 0 0  
0 0 0 0 0 0 1 0  
0 0 0 0 1 0 0 0  
0 0 0 0 0 0 0 1  
0 1 0 0 0 0 0 0  
0 0 0 1 0 0 0 0  
0 0 0 0 0 1 0 0  
0 0 1 0 0 0 0 0  
  
d:\Programming\College Experiments\TY 5 Sem\DAA Lab>
```