

EXP : 1

1. Programs on Problem Solving

a. Write a program to solve 8 Queens problem.

AIM:

To solve 8 queens problem using python program.

CODE:

```
# Taking number of queens as input from user
print ("Enter the number of queens")
N = int(input())
# here we create a chessboard
# NxN matrix with all elements set to 0
board = [[0]*N for _ in range(N)]
def attack(i, j):
    #checking vertically and horizontally
    for k in range(0,N):
        if board[i][k]==1 or board[k][j]==1:
            return True
    #checking diagonally
    for k in range(0,N):
        for l in range(0,N):
            if (k+l==i+j) or (k-l==i-j):
                if board[k][l]==1:
                    return True
    return False
def N_queens(n):
    if n==0:
        return True
    for i in range(0,N):
```

```
        for j in range(0,N):
            if (not(attack(i,j))) and (board[i][j]!=1):
                board[i][j] = 1
                if N_queens(n-1)==True:
                    return True
            board[i][j] = 0
        return False
    N_queens(N)
    for i in board:
        print (i)
```

OUTPUT:

Enter the number of queens

8

[1, 0, 0, 0, 0, 0, 0, 0]

[0, 0, 0, 0, 1, 0, 0, 0]

[0, 0, 0, 0, 0, 0, 0, 1]

[0, 0, 0, 0, 0, 1, 0, 0]

[0, 0, 1, 0, 0, 0, 0, 0]

[0, 0, 0, 0, 0, 0, 1, 0]

[0, 1, 0, 0, 0, 0, 0, 0]

[0, 0, 0, 1, 0, 0, 0, 0]

RESULT:

Thus the program is compiled and run successfully.