Exp. No:

Date :

N - Queen Problem

AIM:

To solve the N-Queens problem by identifying all valid configurations or finding at least one solution, depending on requirements.

ALGORITHM:

Step - 1 : Start

Step - 2 : Create an N×N board with all positions set to 0.

Step - 3 : For each column, try placing a queen in each row.

Step - 4 : Check if the position is safe using the issafe() function (no queen in the same row, column, or diagonal)

Step - 5 : If placing the queen is safe, mark the position with a 1.

Step - 6 : If no valid placement is found, backtrack by removing the queen and try a new position.

Step - 7 : If queens are placed in all columns, print the board.

Step - 8 : If no placement is possible, print "Solution does not exist".

Step - 9 : Stop.

CODE:

```
def printSolution(board):
    for i in range(N):
        for j in range(N):
            if board[i][j] == 1:
```

```
            Print ("Q", end = " ")
        else:
            Print ("-", end = " ")
    Print()
def isSafe (board, row, col):
    for i in range (col):
        if board [row][i] == 1:
            return False
for i, j in zip(range(row, -1, -1), range (col, -1, -1)):
    if board[i][j] == 1:
        return False
for i, j in zip (range(row, N, 1), range (col, -1, -1)):
    if board[i][j] == 1:
        return False
return True
def SolveNQUtil (board, col):
    if col >= N:
        return True
    for i range(N):
        if isSafe (board, i, col):
            board[i][col] = 1
            if solveNQUtil (board, col+1):
                return True
            board[i][col] = 0
    return False
def SolveNQ():
    global N
    N = Input ("Enter the number:")
    board = [[0 for i in range (N)] for j in range (N)]
    if SolveNQUtil (board, 0) == False:
        print ("Solution does not exist")
        return False
```

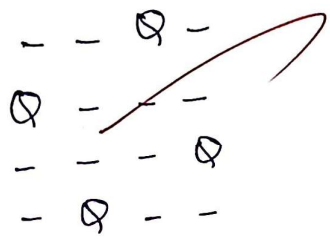
```
        PrintSolution (board)
            return True
    Solve NQ()
```


Output:

Enter the number : 3

Solution does not exist

Enter the number : 4



RESULT:

The program has been successfully executed and the output is verified.