School of Computer Science and Engineering

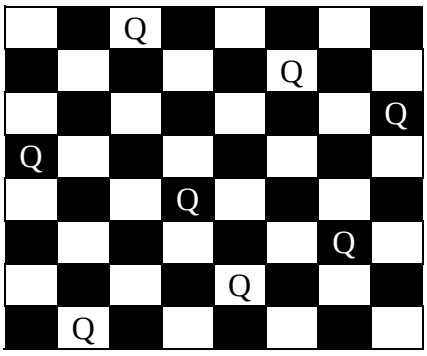
VIT-AP University

Artificial Intelligence: CSE 3002

Laboratory Assignment-7

Topic: Uninformed Search based Problems-NxN Queen Problem

1. The N Queen is the problem of placing N chess queens on an N×N chessboard so that no two queens attack each other. For example, the following is a solution for the 8 Queen problem. Design a program to solve the problem using uninformed search. Also determine the total number of possible solutions.



Code:

```
N = int(input("enter a number: "))
def printSolution(board):
    for i in range(N):
        for j in range(N):
            print(board[i][j], 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
    # Check lower diagonal on left side
    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 in range(N):
        if isSafe(board, i, col):
            board[i][col] = 1
            if solveNQUtil(board, col + 1) == True:
                return True
            board[i][col] = 0
    return False
def solveNQ():
    board = [[0] * N for i in range(N)]

    if solveNQUtil(board, 0) == False:
        print("Solution does not exist")
        return False

    printSolution(board)
    return True
solveNQ()
```

Output:

```
enter a number: 8
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
```

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