**Name :- Harsh Shah**

**CLass:- TE Computer**

**ERP :-67**

**Subject :-LP2(AI) (N Queens)**

**Code:-**

# Function to check if two queens threaten each other or not  
def isSafe(mat, r, c):  
 # return false if two queens share the same column  
 for i in range(r):  
 if mat[i][c] == 'Q':  
 return False  
  
 # return false if two queens share the same `` diagonal  
 (i, j) = (r, c)  
 while i >= 0 and j >= 0:  
 if mat[i][j] == 'Q':  
 return False  
 i = i - 1  
 j = j - 1  
  
 # return false if two queens share the same `/` diagonal4  
 (i, j) = (r, c)  
 while i >= 0 and j < len(mat):  
 if mat[i][j] == 'Q':  
 return False  
 i = i - 1  
 j = j + 1  
  
 return True  
  
  
def printSolution(mat):  
 for r in mat:  
 print(str(r).replace(',', '').replace('\'', ''))  
 print()  
  
  
def nQueen(mat, r):  
 # if `N` queens are placed successfully, print the solution  
 if r == len(mat):  
 printSolution(mat)  
 return  
  
 # place queen at every square in the current row `r`  
 # and recur for each valid movement  
 for i in range(len(mat)):  
  
 # if no two queens threaten each other  
 if isSafe(mat, r, i):  
 # place queen on the current square  
 mat[r][i] = 'Q'  
  
 # recur for the next row  
 nQueen(mat, r + 1)  
  
 # backtrack and remove the queen from the current square  
 mat[r][i] = '–'  
  
  
if \_\_name\_\_ == '\_\_main\_\_':  
 # `N × N` chessboard  
 N = int(input("Enter Number of Queen on N\*N Chess Board :"))  
  
 # `mat[][]` keeps track of the position of queens in  
 # the current configuration  
 mat = [['–' for x in range(N)] for y in range(N)]  
  
 nQueen(mat, 0)

**Output:-**

Enter Number of Queen on N\*N Chess Board :6

[– Q – – – –]

[– – – Q – –]

[– – – – – Q]

[Q – – – – –]

[– – Q – – –]

[– – – – Q –]

[– – Q – – –]

[– – – – – Q]

[– Q – – – –]

[– – – – Q –]

[Q – – – – –]

[– – – Q – –]

[– – – Q – –]

[Q – – – – –]

[– – – – Q –]

[– Q – – – –]

[– – – – – Q]

[– – Q – – –]

[– – – – Q –]

[– – Q – – –]

[Q – – – – –]

[– – – – – Q]

[– – – Q – –]

[– Q – – – –]

