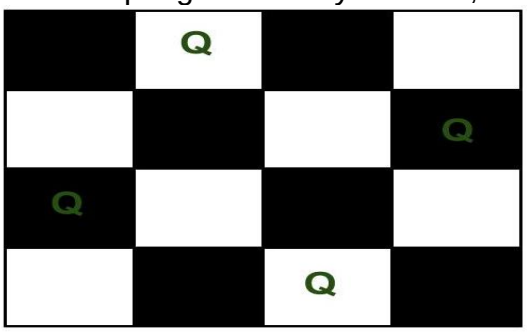
National University of Computer and Emerging Sciences, Lahore Campus

Course:	Programming Fundamentals	Course Code:	CS 118
Program:	BS(Computer Science)	Semester:	Fall 2020
Due Date	03-Jan-2020	Total Marks:	20
Section:	CS-1G	Page(s):	1
Type:	Assignment 5	Weightage	

Important Instructions:

1. Submit your solution in a single cpp file named as your roll number, i.e., 20_1111.cpp. Do not zip your file.
2. You are not allowed to copy solutions from other students. We will check your code for plagiarism using plagiarism checkers. If any sort of cheating is found, negative marks will be given to all students involved.
3. Late submission of your solution is not allowed

N-Queen problem is a problem in which an n by n board is given, and n queens are to be placed in such a way that no two queens are in the same column, row or diagonal. For example given a 4-by-4 board, a valid n-queen solution would be:



There can be more than 1 solution for a given n x n board.

- Write a program which reads a board configuration (a candidate solution to n-queen problem) from the file and determines whether the given solution to n-queen problem is a valid solution or not.
  If the file has:

```
4
0,  1,  0,  0
0,  0,  0,  1
1,  0,  0,  0
0,  0,  1,  0
```

  The first value in the file tells us about board size. For example, 4 means that the board is 4x4. Similarly a value of 6 would mean that the board is 6x6. The size of board can be from 4x4 to 50x50. The remaining values are cells of the board. 1 at a cell means that a queen is placed in that cell. 0 at a cell means that no queen is placed in that cell. The program will print the message “The given solution is valid” if:
  1. There are exactly n queens (not less than n and not greater than n).
  2. No two queens are placed in the same column, row or diagonal.

  Otherwise the program will print “The given solution is not valid”.

(Hint: A 2d boolean array can be helpful)