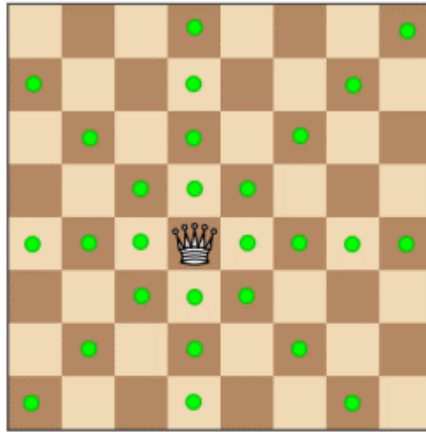


Problem 2. Too Many Queens in the Kitchen

The n -queens problem is a chess puzzle where the player must try to place n queens onto an $n \times n$ chessboard without any two queens “attacking” each other. There are solutions for all values of n .

In chess, a queen is piece that can move any number of squares vertically, horizontally, or diagonally. In the image below, the queen can move to any square with a green dot.



Source: learnchessrules.com

A queen is “attacking” another piece if it can immediately move to the square the other piece is currently occupying. Your task, should you choose to accept it, is to check, given an $n \times n$ board with k queens placed on it, whether or not any of the specified queens attack each other.

Input

The input begins with a line containing a pair of numbers n and k , where n is the size of the board, and k is the number of queens. Here $1 \leq n \leq 1000$ and $1 \leq k \leq n$. The following k lines contain a pair of numbers (i, j) with $1 \leq i \leq n$ and $1 \leq j \leq n$. Each (i, j) represents a queen that is placed on the i th column (from the left) and j th row (from the bottom). No two of the specified queens will occupy the same square. See the samples below.

Output

Print one line one line consisting of the word “Valid” if no queens are attacking each other, and “Invalid” otherwise.

Examples

standard input	standard output
4 4 1 2 2 4 3 1 4 3	Valid
4 2 1 1 4 4	Invalid