Sudoku Checker

Source: https://code.google.com/codejam/contest/2929486/dashboard

Problem

Sudoku is a popular single player game. The objective is to fill a 9x9 matrix with digits so that each column, each row, and all 9 non-overlapping 3x3 sub-matrices contain all of the digits from 1 through 9. Each 9x9 matrix is partially completed at the start of game play and typically has a unique solution.

5	3			7				
6			1	9	5			
	9	8					6	
8				6				З
4			8		3			1
7				2				6
	6					2	8	
			4	1	9			5
				8			7	9

5	3	4	6	7	8	9	1	2
6	7	2	1	9	5	3	4	8
1	9	8	3	4	2	5	6	7
8	5	9	7	6	1	4	2	3
4	2	6	8	5	3	7	9	1
7	1	3	9	2	4	8	5	6
9	6	1	5	3	7	2	8	4
2	8	7	4	1	9	6	3	5
3	4	5	2	8	6	1	7	9

Given a completed $N^2 x N^2$ Sudoku matrix, your task is to determine whether it is a *valid* solution. A *valid* solution must satisfy the following criteria:

- Each row contains each number from 1 to \mathbf{N}^2 , once each.
- Each column contains each number from 1 to N^2 , once each.
- Divide the N²xN² matrix into N² non-overlapping NxN sub-matrices. Each sub-matrix contains each number from 1 to N², once each.

You don't need to worry about the uniqueness of the problem. Just check if the given matrix is a valid solution.

Input

The first line of the input gives the number of test cases, **T**. **T** test cases follow. Each test case starts with an integer **N**. The next N^2 lines describe a completed Sudoku solution, with each line contains exactly N^2 integers. All input integers are positive and less than 1000.

Output

For each test case, output one line containing "Case #x: y", where x is the case number (starting from 1) and y is "Yes" (quotes for clarity only) if it is a valid solution, or "No" (quotes for clarity only) if it is invalid. Note that the judge is case-sensitive, so answers of "yes" and "no" will not be accepted.

Limits

 $1 \le \mathbf{T} \le 100.$

Small dataset

N = 3.

Large dataset

 $N \leq 10.$

Sample

Input								Output				
335618479233	379521684	4 2 8 9 6 3 1 7 5	6 1 3 7 8 9 5 4 2	7 9 4 6 5 2 3 1 8	8 5 2 1 3 4 7 9 6	935478261	1 4 6 2 9 5 8 3 7	2 8 7 3 1 6 4 5 9				
3 1 1 1 1 1 1 1 1 1 1 2	2 2 2 2 2 2 2 2 2 2 2 2	3 3 3 3 3 3 3 3 3 3 3 3 3	4 4 4 4 4 4 4 4 4 4	5 5 5 5 5 5 5 5 5	6 6 6 6 6 6 6 6	7 7 7 7 7 7 7 7 7	8 8 8 8 8 8 8 8 8 8 8	9 9 9 9 9 9 9 9 9 9 9		Case Case Case	#1: #2: #3:	Yes No No
3561847923	3 7 9 5 2 1 6 8 4	428963175	6 1 3 7 8 9 5 4 2	7 9 4 6 9 2 3 1 8	8 5 2 1 9 4 7 9 6	935438261	146275837	2 8 7 3 9 6 4 5 9	1			