

Problem 4**Sudoku Junior****60 Points**

Program Name: sudoku1.java

Input File: sudoku1.in

1	4	2	3
2	3	1	4
3	2	4	1
4	1	3	2

1	4	2	3
2	3	1	4
3	2	4	1
4	1	3	2

1	4	2	3
2	3	1	4
3	2	4	1
4	1	3	2

1	4	2	3
2	3	1	4
3	2	4	1
4	1	3	2

Write a program to determine if a given sudoku solution is valid.

This sudoku game is played on a 4x4 grid. When finished, each cell on the board will contain a single integer: 1, 2, 3, or 4. The numbers are placed so that each row, column, and quadrant of the board contains each of the four numbers exactly once. If the board meets this criteria, it is a valid solution.

Input

The first line of input will contain a single integer n indicating the number of data sets to process. The remainder of the input consists of n solved, though possibly invalid, sudoku boards. Note that the input is always a 4x4 grid consisting solely of the integers 1-4.

Output

For each sudoku board in the input, print one of the following statements declaring whether or not the solution is valid:

Board #X is valid

Board #X is invalid

where X is 1 for the first board, 2 for the second, etc.

Example Input File

```
3
1423
2314
3241
4132
2134
3421
1214
4321
1234
2341
3412
4123
```

Example Output To Screen

```
Board #1 is valid
Board #2 is invalid
Board #3 is invalid
```