

Round 1A 2009

A. Multi-base happiness

[B. Crossing the Road](#)

[C. Collecting Cards](#)

[Contest Analysis](#)

Questions asked 1

Submissions

Multi-base happiness

9pt Not attempted
1955/2202 users
correct (89%)

18pt Not attempted
481/1714 users
correct (28%)

Crossing the Road

13pt Not attempted
213/429 users
correct (50%)

20pt Not attempted
172/239 users
correct (72%)

Collecting Cards

10pt Not attempted
390/868 users
correct (45%)

30pt Not attempted
311/377 users
correct (82%)

Top Scores

LayCurse	100
TripleM	100
Eryx	100
austrin	100
ivan.popelyshev	100
krijgertje	100
neal.wu	100
AS1	100
Ahyangyi	100
crazyb0y	100

Problem A. Multi-base happiness

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the [Quick-Start Guide](#) to get started.

Small input
9 points

Solve A-small

Large input
18 points

Solve A-large

Problem

Given an integer N, replace it by the sum of the squares of its digits. A happy number is a number where, if you apply this process repeatedly, it eventually results in the number 1. For example, if you start with 82:

$$\begin{array}{rclcl} 8*8 + 2*2 & = & 64 + 4 & = & 68, \text{ repeat:} \\ 6*6 + 8*8 & = & 36 + 64 & = & 100, \text{ repeat:} \\ 1*1 + 0*0 + 0*0 & = & 1 + 0 + 0 & = & 1 \text{ (happy! :)} \end{array}$$

Since this process resulted in 1, 82 is a happy number.

Notice that a number might be happy in some bases, but not happy in others. For instance, the base 10 number 82 is not a happy number when written in base 3 (as 10001).

You are one of the world's top number detectives. Some of the bases got together (yes, they are organized!) and hired you for an important task: find out what's the smallest integer number that's greater than 1 and is happy in all the given bases.

Input

The first line of input gives the number of cases T. T test cases follow. Each case consists of a single line. Each line contains a space separated list of distinct integers, representing the bases. The list of bases is always in increasing order.

Output

For each test case, output:

Case #X: K

where X is the test case number, starting from 1, and K is the decimal representation of the smallest integer (greater than 1) which is happy in all of the given bases.

Limits

2 ≤ all possible input bases ≤ 10

Small dataset

1 ≤ T ≤ 42

2 ≤ number of bases on each test case ≤ 3

Large dataset

1 ≤ T ≤ 500

2 ≤ number of bases on each test case ≤ 9

Sample

Input	Output
3	Case #1: 3
2 3	Case #2: 143
2 3 7	Case #3: 91
9 10	

Important Note

Please remember that you must submit all code used to solve the problem.

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