Problem A. Multi-base happiness

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:

```
8*8 + 2*2       = 64 + 4    = 68,  repeat:
6*6 + 8*8       = 36 + 64   = 100, repeat:
1*1 + 0*0 + 0*0 = 1 + 0 + 0 = 1 (happy! :)
```

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

Important Note

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