Weekly Puzzle #2

Lambert the sheep has devised a strategy to help him fall asleep faster. First, he picks a number **N**. Then he starts naming **N**, 2 × **N**, 3 × **N**, and so on. Whenever he names a new number, he keeps track of which digits (0, 1, 2, 3, 4, 5, 6, 7, 8, and 9) he has seen at least once so far as part of any number he has named. Once he has seen each of the ten digits at least once, he will instantly fall asleep.

Lambert must start with **N** and must always name (*i* + 1) × **N** directly after *i* × **N**. For example, suppose that Lambert picks **N** = 1692. He would count as follows:

- **N** = 1692. Now he has seen the digits 1, 2, 6, and 9.
- 2**N** = 3384. Now he has seen the digits 1, 2, 3, 4, 6, 8, and 9.
- 3**N** = 5076. Now he has seen all ten digits, and falls asleep.

So what is the last number he names before falling asleep?
If he ends up counting forever, print `INSOMNIA` instead.

Input

The first line of the input gives the number of test cases, **T**. **T** test cases follow. Each consists of one line with a single integer **N**, the number Lambert has chosen.

Output

For each test case, output one line containing `Case x: y`, where `x` is the test case number (starting from 1) and `y` is the last number that Lambert will name before falling asleep, or `INSOMNIA` if he cannot fall asleep.

Limits

1 ≤ **T** ≤ 100.
0 ≤ **N** ≤ 10^5.

Sample

Input	Output
5 0 1 2 11 1692	Case 1: INSOMNIA Case 2: 10 Case 3: 90 Case 4: 110 Case 5: 5076

In Case #1, since 2 × 0 = 0, 3 × 0 = 0, and so on, Lambert will never see any digit other than 0, and so he will count forever and never fall asleep.

In Case #2, Lambert will name 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. The 0 will be the last digit needed, and so he will fall asleep after naming 10.

In Case #3, Lambert will name 2, 4, 6... and so on. He will not see the digit 9 in any number until 90, at which point he will fall asleep. By that point, he will have already seen the digits 0, 1, 2, 3, 4, 5, 6, 7, and 8, which will have appeared for the first time in the numbers 10, 10, 2, 30, 4, 50, 6, 70, and 8, respectively.

In Case #4, Lambert will name 11, 22, 33, 44, 55, 66, 77, 88, 99, 110 and then fall asleep.

Case #5 is the one described in the problem statement.

Test Set	Input	Output
Test set 1	5 0 1 2 11 1692	Case 1: INSOMNIA Case 2: 10 Case 3: 90 Case 4: 110 Case 5: 5076