Challenge 9 - 0-1 Immiscible numbers

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Numbers are too complicated. You are tired of the fact that their digits can be in any order and they are confusing to read. Some numbers though, like x-y immiscible numbers, you like for their simplicity. We say that a number is x-y immiscible if its digits are only **x** and **y**, and they are in non-ascending order. For instance, 55533 is a 3-5 immiscible number. Among these your absolute favourites are 0-1 immiscible numbers. What is there to dislike about them? They're the easiest numbers to read ever!

Given a number N, we want to find the smallest multiple of N which is a 0-1 immiscible number.

Input

The first line will contain an integer **C**, the number of cases for our problem.
This is followed by **C** lines, each with an integer.

Output

For each case, a line starting with "Case #x: " followed by two integers separated by a space: the number of ones and the number zeroes of the smallest 0-1 immiscible multiple of N. Every line is followed by a new line character.

Examples

Case 1:	Case 2:	Case 3:	Case 4:	Case 5:	Case 6:
1	10	3	12	32	10560

In Case 1, the answer is 1
In Case 2, the answer is 10
In Case 3, the answer is 111 = 3 * 37

In Case 4, the answer is 11100 = 12 * 5^2 * 37
In Case 5, the answer is 100000 = 32 * 5^5
In Case 6, the answer is 111111000000 = 10560 * 5^5 * 7 * 13 * 37

Limits

- 1 ≤ **N** ≤ 2^{31}

Sample Input

```
6
1
10
3
12
32
10560
```

Sample Output

```
Case #1: 1 0
Case #2: 1 1
Case #3: 3 0
Case #4: 3 2
Case #5: 1 5
Case #6: 6 6
```

Test your code

You can test your program against both the input provided in the test phase and the input provided in the submit phase. A nice output will tell you if your program got the right solution or not. You can try as many times as you want to. Be careful with extra whitespaces, the output should be exactly as described.

Test your program against the input provided in the test phase

Download test input

Program output:

Seleccionar archivo Ningún archivo seleccionado

Submit test output

Test your program against the input provided in the submit phase

Download input

Program output:

Seleccionar archivo Ningún archivo seleccionado

Submit output

During the submit phase, in some problems, we might give your program harder inputs. As with the test token, a nice output will tell you if your program got the right solution or not. You can try as many times as you need.

In the actual contest you first need to solve the test phase before submitting the code, you must provide the source code used to solve the challenge and you can only submit once (once your solution is submitted you won't be able to amend it to fix issues or make it faster).

If you have any doubts, please check the info section.

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