3172 Period of an Infinite Binary Expansion

Let $x = 0.a_1a_2a_3\ldots$ be the binary representation of the fractional part of a rational number z. Suppose that $\{x\}$ is periodic then, we can write

$$\{x\} = 0.a_1a_2\ldots a_r(a_{r+1}a_{r+2}\ldots a_{r+s})^{\omega}$$

for some integers r and s with $r \geq 0$ and $s > 0$. Also, $(a_{r+1}a_{r+2}\ldots a_{r+s})^{\omega}$ denotes a nonterminating and repeating binary subsequence of $\{x\}$.

The subsequence $x_1 = a_1a_2\ldots a_r$ is called the *preperiod* of $\{x\}$ and $x_2 = a_{r+1}a_{r+2}\ldots a_{r+s}$ is the *period* of $\{x\}$.

Suppose that $|x_1|$ and $|x_2|$ are chosen as small as possible then x_1 is called the least preperiod and x_2 is called the *least period* of $\{x\}$.

For example, $x = \frac{1}{10} = 0.0001100110011(00110011)^{\omega}$ and 0001100110011 is a preperiod and 00110011 is a period of $\frac{1}{10}$.

However, we can write $\frac{1}{10}$ also as $\frac{1}{10} = 0.0(0011)^{\omega}$ and 0 is the least preperiod and 0011 is the least period of $\frac{1}{10}$

The least period of $\frac{1}{10}$ starts at the 2nd bit to the right of the binary point and the the length of the least period is 4.

Write a program that finds the position of the first bit of the least period and the length of the least period where the preperiod is also the minimum of a positive rational number less than 1.

Input

Each line is test case. It represents a rational number 'p/q' where p and q are integers, $p \geq 0$ and $q > 0$.

Output

Each line corresponds to a single test case. It represents a pair where the first number is the position of the first bit of the least period and the the second number is the length of the least period of the rational number.

Sample Input

```
1/10
1/5
101/120
121/1472
```

Sample Output

```
Case #1:  2,4
Case #2:  1,4
Case #3:  4,4
Case #4:  7,11
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