Problem D. Mr. Panda and Geometric Sequence

Input file: standard input
Output file: standard output

Mr. Panda likes playing with numbers. One day he picked up a number 3612 and found it's interesting. 3612 can be divided into 3 numbers 3, 6 and 12 which forms an integer geometric sequence.

An integer geometric sequence is a sequence of at least 3 positive integer numbers $a_0, a_1, \ldots, a_{n-1}$, also there is a positive number D ($D > 1$) that for each $i (0 \leq i < n - 1)$, $a_i \times D = a_{i+1}$.

Mr. Panda named this kind of numbers "Happy Number". He also announced that leading zeros are forbidden, which means there should be no extra zeros before the numbers. Now Mr. Panda would like to know how many Happy Numbers are between L and R inclusive.

Input

The first line of the input gives the number of test cases, T. T test cases follow. Each test case contains one line which consists of two numbers L and R.

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 number of Happy Numbers between L and R inclusive.

Limits

- $1 \leq T \leq 2 \times 10^5$.
- $0 \leq L \leq R \leq 10^{15}$.

Example

standard input	standard output
4 123 124 468 470 248 248 124816 124832	Case #1: 1 Case #2: 1 Case #3: 1 Case #4: 1

Note

In the first test case, the only Happy Number between `123` and `124` is `124`, in which $1 \times 2 = 2$ and $2 \times 2 = 4$.

In the second test case, the only Happy Number is 248.

In the third test case, the only Happy Number is 469, the common radio is $\frac{3}{2}$.

In the fourth test case, the only Happy number between `124816` and `124832` is `124816`, in which $1 \times 2 = 2$, $2 \times 2 = 4$, $4 \times 2 = 8$ and $8 \times 2 = 16$.