

Problem H. Hard Work

Time limit: 1 second
Memory limit: 512 megabytes

Alexey works as a mathematician in a well-known company “WordCount”. Since his project has recently been closed, he was given a rather strange kind of assignment as a replacement: he must write down consecutive integers in a certain range every month, and at the end of the month the accounting department makes some calculations that determine Alexey’s salary.

Alexey’s salary is calculated as follows: first, the accounting department finds such x that there exists an integer with x identical consecutive digits among the integers that Alexey has written down, but there is no integer with $x + 1$ identical consecutive digits among them. Then the integers that have x identical consecutive digits are counted and the resulting amount is Alexey’s salary.

Alexey is a smart mathematician so he doesn’t want to work for peanuts. Today he was given a work plan for the next t months. During the i -th month he must write down integers from l_i to r_i inclusive. Help Alexey to calculate, what his salary would be each month, if the accounting department always does its calculations right.

Input

The first line of input contains a single integer t , the number of months for which Alexey’s salary should be calculated ($1 \leq t \leq 10^4$).

The i -th of the following t lines contains two space-separated integers l_i and r_i , the first and the last integer Alexey will write down during the i -th month ($1 \leq l_i \leq r_i \leq 10^{18}$).

Output

For each given month you should print a line with the calculated value of x and Alexey’s salary for that month.

Examples

standard input	standard output
1 312 348	3 1
1 223 329	2 17

Note

Alexey writes down integers from 312 and 348 in the first example. There is an integer 333 that has three identical consecutive digits. There are no other integers between those that have three identical consecutive digits, so the answer is “3 1”.

In the second example, there are no integers with three identical consecutive digits between 223 and 329. The integers with two identical consecutive digits can be divided into three groups:

- $\overline{22x}$ (from 223 to 229)
- $\overline{2xx}$ (from 233 to 299)
- $\overline{3xx}$ (300, 311 and 322)

There are exactly 17 integers so the answer is “2 17”.