1045 - Digits of Factorial

Factorial of an integer is defined by the following function

$$f(0) = 1$$

 $f(n) = f(n-1) * n, if(n > 0)$

So, factorial of 5 is 120. But in different bases, the factorial may be different. For example, factorial of 5 in base 8 is 170.

In this problem, you have to find the number of digit(s) of the factorial of an integer in a certain base.

Input

Input starts with an integer T (\leq 50000), denoting the number of test cases.

Each case begins with two integers $n \ (0 \le n \le 10^6)$ and base $(2 \le base \le 1000)$. Both of these integers will be given in decimal.

Output

For each case of input you have to print the case number and the digit(s) of factorial n in the given base.

Sample Input	Output for Sample Input
5	Case 1: 3
5 10	Case 2: 5
8 10	Case 3: 45
22 3	Case 4: 18488885
1000000 2	Case 5: 1
0 100	