Sorting by the number of divisors   P64854_en
Examen extraordinari d'Informàtica, FME (2015-07-06)

Given n natural numbers, sort them. First, by its number of divisors (the larger the better); in case of a tie, by its number of digits (the larger the better); and in case of another tie, by its value (the smaller the better).

Input

Input consists of several cases, each one with n followed by n numbers between 1 and 10^7. You can assume $1 \leq n \leq 10^4$.

Output

For every case, print n lines with every number and its number of divisors, sorted as it is explained above. Print a line with 10 dashes at the end of every case.

Hint

Rememeber that, if the factorization of a number is $p_1^{q_1} \cdots p_m^{q_m}$, then its number of divisors is $(q_1 + 1) \cdots (q_m + 1)$. For instance, for $12 = 2^2 \cdot 3^1$ there are $(2 + 1) \cdot (1 + 1) = 6$ divisors.

Sample input

```
9   12 1 5 1000 10 8 9 34549 10007
4   10000000 9999999 9999998 9999997
3   23 23 23
```

Sample output

```
1000 16
12 6
10 4
8 4
9 3
10007 2
34549 2
5 2
1 1
----------
10000000 64
9999999 12
9999997 4
9999998 4
----------
23 2
23 2
23 2
----------
```

Problem information

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