

Problem A

Perfect Power

Time limit: 1 second

If a positive integer n can be expressed as the power of another integer greater than 1, then it is called a *perfect power*. For example, both 8 and 9 are perfect powers because $8 = 2^3$ and $9 = 3^2$. Formally, n is a perfect power if there are integers $m > 1$ and $k > 1$ such that

$$n = m^k.$$

Write a program, on input a positive integer n , determine whether n is a perfect power or not. If n is a perfect power, compute m and k so that $n = m^k$, and print them out.

There may be many pairs m and k satisfying the equation $n = m^k$. For example, $625 = 25^2 = 5^4$. If the solution is not unique, print out the solution with largest k .

Input Format

The input file may contain many positive integers, one integer per line. The value of every integer is less than $2^{63} - 1$.

The last line of the input file contains a "0". It indicates the end of the test data.

Output Format

For each integer n in the input file, except the last one (which is a 0), determine whether $n = m^k$ for some positive integers $m > 1$ and $k > 1$. If n is a perfect power, print the values of m and k on one line with a space between them. If n is not a perfect power, then let $m = n$ and $k = 1$, and print them in the same way that n is a perfect power.

Sample Input

```
8
9
12
625
0
```

Output for the Sample Input

2 3
3 2
12 1
5 4