

E. Math

time limit per test: 1 second
 memory limit per test: 256 megabytes
 input: standard input
 output: standard output

JATC's math teacher always gives the class some interesting math problems so that they don't get bored. Today the problem is as follows. Given an integer n , you can perform the following operations zero or more times:

- `mul x`: multiplies n by x (where x is an arbitrary positive integer).
- `sqrt`: replaces n with \sqrt{n} (to apply this operation, \sqrt{n} must be an integer).

You can perform these operations as many times as you like. What is the minimum value of n , that can be achieved and what is the minimum number of operations, to achieve that minimum value?

Apparently, no one in the class knows the answer to this problem, maybe you can help them?

Input

The only line of the input contains a single integer n ($1 \leq n \leq 10^6$) — the initial number.

Output

Print two integers: the minimum integer n that can be achieved using the described operations and the minimum number of operations required.

Examples

input	Copy
20	
output	Copy
10 2	

input	Copy
5184	
output	Copy
6 4	

Note

In the first example, you can apply the operation `mul 5` to get 100 and then `sqrt` to get 10.

In the second example, you can first apply `sqrt` to get 72, then `mul 18` to get 1296 and finally two more `sqrt` and you get 6.

Note, that even if the initial value of n is less or equal 10^6 , it can still become greater than 10^6 after applying one or more operations.

Topic Stream Mashup: Number Theory

Finished

Practice



→ Virtual participation

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Language: GNU G++17 7.3.0

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