B. 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.

Codeforces Round #520 (Div. 2)
Finished

→ Practice?

Want to solve the contest problems after the official contest ends? Just register for practice and you will be able to submit solutions.

Register for practice

→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ACM-ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Problem tags

greedy math number theory *1600

No tag edit access

→ Contest materials

- Announcement
- Tutorial

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