C. Primes and Multiplication

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

Let's introduce some definitions that will be needed later.

Let $prime(x)$ be the set of prime divisors of x. For example, $prime(140) = \{2, 5, 7\}$, $prime(169) = \{13\}$.

Let $g(x, p)$ be the maximum possible integer p^k where k is an integer such that x is divisible by p^k. For example:

- $g(45, 3) = 9$ (45 is divisible by $3^2 = 9$ but not divisible by $3^3 = 27$),
- $g(63, 7) = 7$ (63 is divisible by $7^1 = 7$ but not divisible by $7^2 = 49$).

Let $f(x, y)$ be the product of $g(y, p)$ for all p in $prime(x)$. For example:

- $f(30, 70) = g(70, 2) \cdot g(70, 3) \cdot g(70, 5) = 2^1 \cdot 3^0 \cdot 5^1 = 10$,
- $f(525, 63) = g(63, 3) \cdot g(63, 5) \cdot g(63, 7) = 3^2 \cdot 5^0 \cdot 7^1 = 63$.

You have integers x and n. Calculate $f(x, 1) \cdot f(x, 2) \cdot \ldots \cdot f(x, n) \bmod (10^9 + 7)$.

Input

The only line contains integers x and n ($2 \le x \le 10^9$, $1 \le n \le 10^{18}$) — the numbers used in formula.

Output

Print the answer.

Examples

input	Copy
10 2	

output	Copy
2	

input	Copy
20190929 1605	

output	Copy
363165664	

input	Copy
947 987654321987654321	

output	Copy
593574252	

Note

In the first example, $f(10, 1) = g(1, 2) \cdot g(1, 5) = 1$, $f(10, 2) = g(2, 2) \cdot g(2, 5) = 2$.

In the second example, actual value of formula is approximately $1.597 \cdot 10^{171}$. Make sure you print the answer modulo $(10^9 + 7)$.

In the third example, be careful about overflow issue.