Strange Numbers

DiPS CodeJam 22

Prompt

Pranav and Prithvi are playing a game of *Strange Numbers*. Pranav gives Prithvi 2 numbers, x and k. Prithvi now needs to determine wether there is an integer a, such that it has x positive divisors and exactly k of them are prime numbers. Can you help him?

Input Format

The first and only line of the input will contain 2 space-separated integers in the format x, k.

Output Format

The first and only line of your output must contain: 1, if an integer a exists, or 0 if it does not.

Constraints

$1 \leq a \leq 1000$

Sample Input/Output

Input	Output
8 6	0

Solution

Let's assume that a valid a exists. The prime factorisation of a would be $\prod_{i=1}^{k} p_i^{a_i}$ where p_i are the prime factors of a and a_i are the exponents. Then, it is known that the number of factors of a are $\prod_{i=1}^{k}(a_i+1)$. Hence, we have $x = \prod_{i=1}^{k}(a_i + 1)$ for $a_i \geq 1$, hence $(a_i + 1) \geq 2$. Thus, valid choice for a exists if the prime factorization of x has at least k terms. So, we just need to compute prime factorization of x.

Sample Program

```
x,k = map(int, input().split())
c = 1
i = 2
while i*i <= x:
  while x%i==0:
    x//=i
    c+=1
  i+=1
if c >= k:
  print(1)
```

```
else:
  print(0)
```