Problem C. Dirichlet k-th root

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	256 mebibytes

Mathematician Pang learned Dirichlet convolution during the previous camp. However, compared with deep reinforcement learning, it's too easy for him. Therefore, he did something special.

If $f, g : \{1, 2, \ldots, n\} \to \mathbb{Z}$ are two functions from the positive integers to the integers, the Dirichlet convolution $f * g$ is a new function defined by:

$$(f * g)(n) = \sum_{d|n} f(d)g(\frac{n}{d}).$$

We define the k-th power of an function $g = f^k$ by

$$f^k = \underbrace{f * \cdots * f}_{k \text{ times}}.$$

In this problem, we want to solve the inverse problem: Given g and k, you need to find a function f such that $g = f^k$.

Moreover, there is an additional constraint that $f(1)$ and $g(1)$ must equal to 1. And all the arithmetic operations are done on $\mathbb{F}_p$ where $p = 998244353$, which means that in the Dirichlet convolution, $(f * g)(n) = \left(\sum_{d|n} f(d)g(\frac{n}{d})\right) \bmod p$.

Input

The first line contains two integers n and k $(2 \le n \le 10^5, 1 \le k < 998244353)$.

The second line contains n integers $g(1), g(2), ..., g(n)$ $(0 \le g(i) < 998244353, g(1) = 1)$.

Output

If there is no solution, output -1.

Otherwise, output $f(1), f(2), ..., f(n)$ $(0 \le f(i) < 998244353, f(1) = 1)$. If there are multiple solutions, print anyone.

Example

standard input	standard output
5 2 1 8 4 26 6	1 4 2 5 3