Square

Description

Given a sequence of integers $a_1, a_2, \ldots, a_n$, A-Long wants to find another sequence $b_1, b_2, \ldots, b_n$, s.t.,

1. $\forall 1 \leq i \leq n, b_i > 0$.
2. $\forall 1 \leq i \leq n-1, (a_i \cdot b_i \cdot a_{i+1} \cdot b_{i+1})$ is a square number, i.e., $\exists n \in \mathbb{N}$, s.t. $a_i \cdot b_i \cdot a_{i+1} \cdot b_{i+1} = n^2$.
3. $\prod_{i=1}^{n} b_i$ is minimized.

Please help A-Long find such sequence b_i. You are only required to compute $\prod_{i=1}^{n} b_i \pmod{10^9+7}$ as it may be extremely large.

Input

The input data may contain multiple test cases, terminated by EOF.

For each test case:

- The first line contains an integer n.
- The second line contains n integer, the i-th of which is a_i.

Output

For each test case, print one integer - the answer modulo 10^9+7 in a line.

Sample Input/Output

Input

```
3
2 6 3
```

Output

```
6
```

Explanation

The corresponding sequence b is $(3, 1, 2)$.

Constraint

$1 \leq n \leq 10^5, 1 \leq a_i \leq 10^5$. There are at most 5 test cases.