D - Make Geometric Sequence

Editorial (/contests/abc413/tasks/abc413_d/editorial)

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 425 points

Problem Statement

You are given an integer sequence $A = (A_1, A_2, \ldots, A_N)$ of length N. It is guaranteed that for any i $(1 \leq i \leq N)$, A_i is not 0.

Determine whether there exists a permutation $B = (B_1, B_2, \ldots, B_N)$ of A such that B forms a geometric sequence.

A sequence $S = (S_1, S_2, \ldots, S_N)$ is a geometric sequence if there exists a real number r such that $S_{i+1} = rS_i$ for all integers $1 \leq i < N$.

Solve T test cases per input file.

Constraints

- $1 \leq T \leq 10^5$
- $2 \leq N \leq 2 \times 10^5$

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- $-10^9 \leq A_i \leq 10^9\ (1 \leq i \leq N)$
- $A_i \neq 0\ (1 \leq i \leq N)$
- The sum of N over all test cases in a single input file is at most 2×10^5.
- All input values are integers.

Input

The input is given from standard input in the following format:

$$
\begin{aligned}
&T \\
&\mathrm{testcase}_1 \\
&\mathrm{testcase}_2 \\
&\vdots \\
&\mathrm{testcase}_T
\end{aligned}
$$

where $\mathrm{testcase}_i$ is the i-th test case $(1 \leq i \leq T)$, and each test case is given in the following format:

$$
\begin{aligned}
&N \\
&A_1 \quad A_2 \quad \ldots \quad A_N
\end{aligned}
$$

Output

Output T lines. The i-th line $(1 \leq i \leq T)$ should contain `Yes` if A can be rearranged to form a geometric sequence in the i-th test case, and `No` otherwise.

Sample Input 1 Copy

Copy

```
3
5
1 8 2 4 16
5
-16 24 54 81 -36
7
90000 8100 -27000 729 -300000 -2430 1000000
```

Sample Output 1 Copy

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```
Yes
No
Yes
```

Copy

In the first test case, the rearrangement $(16, 8, 4, 2, 1)$ of A forms a geometric sequence with common ratio $r = \frac{1}{2}$. Thus, print `Yes` on the first line.

In the second test case, no rearrangement of A satisfies the condition. Thus, print `No` on the second line.

Language

Python (CPython 3.11.4)

Source Code

Open File | Customize | Toggle Editor | Auto Height

```
1
```

* at most 512 KiB
* Your source code will be saved as Main.*extension*.

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Submit

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