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D - Make Geometric Sequence

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 425 points

Problem Statement

You are given an integer sequence $A = (A_1, A_2, \dots, A_N)$ 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 $B = (B_1, B_2, \dots, B_N)$ of A such that B forms a geometric sequence.

A sequence $S = (S_1, S_2, \dots, S_N)$ 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:

```
T
testcase1
testcase2
⋮
testcaseT
```

where testcase_i is the i -th test case ($1 \leq i \leq T$), and each test case is given in the following format:

```
N
A1 A2 ... AN
```

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](#)

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

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Sample Output 1

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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

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1 |

* at most 512 KiB

* Your source code will be saved as `Main.extension`.



Verifying...



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