B. Karina and Array

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Karina has an array of n integers $a_1, a_2, a_3, \ldots, a_n$. She loves multiplying numbers, so she decided that the *beauty* of a pair of numbers is their product. And the *beauty* of an array is the maximum *beauty* of a pair of **adjacent** elements in the array.

For example, for $n = 4$, $a = [3, 5, 7, 4]$, the *beauty* of the array is $\max(3 \cdot 5, 5 \cdot 7, 7 \cdot 4) = \max(15, 35, 28) = 35$.

Karina wants her array to be as *beautiful* as possible. In order to achieve her goal, she can remove some elements (possibly zero) from the array. After Karina removes all elements she wants to, the array must contain at least two elements.

Unfortunately, Karina doesn't have enough time to do all her tasks, so she asks you to calculate the maximum *beauty* of the array that she can get by removing any number of elements (possibly zero).

Input

The first line of the input contains an integer t ($1 \le t \le 10^4$) — the number of test cases.

The description of the test cases follows.

The first line of a test case contains an integer n ($2 \le n \le 2 \cdot 10^5$) — the length of the array a.

The second line of a test case contains n integers $a_1, a_2, a_3, \ldots, a_n$ ($-10^9 \le a_i \le 10^9$) — the elements of the array a.

The sum of all values of n across all test cases does not exceed $2 \cdot 10^5$.

Output

Output t integers, each of which is the answer to the corresponding test case — the maximum *beauty* of the array that Karina can get.

Example

input Copy

```
7
4
5 0 2 1
3
-1 1 0
5
2 0 -1 -4 0
6
-8 4 3 7 1 -9
6
0 3 -2 5 -4 -4
2
1000000000 910000000
7
-1 -7 -2 -5 -4 -6 -3
```

output Copy

```
10
0
4
72
16
910000000000000000
42
```

Codeforces Round 867 (Div. 3)
Finished
Practice

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Clone Contest

→ Submit?

Language: GNU G++17 7.3.0

Choose file: Escolher arquivo Nenhu...colhido

Submit

→ Last submissions

Submission	Time	Verdict
207806949	May/30/2023 04:49	Accepted

→ Problem tags

greedy math sortings *800

No tag edit access

→ Contest materials

- Announcement
- Tutorial

Note

In the first test case of the example, to get the maximum beauty, you need to remove the 2-nd element.

In the second and third test cases of the example, there is no need to remove any elements to achieve maximum beauty.

In the fourth test case of the example, you need to leave only the first and last elements.
