



Find Maximum Index Product

by trophies

Problem

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You are given a list of N numbers a_1, a_2, \dots, a_n . For each element at position i ($1 \leq i \leq N$), we define $Left(i)$ and $Right(i)$ as:

$Left(i)$ = closest index j such that $j < i$ and $a_j > a_i$. If no such j exists then $Left(i) = 0$.

$Right(i)$ = closest index k such that $k > i$ and $a_k > a_i$. If no such k exists then $Right(i) = 0$.

We define $IndexProduct(i) = Left(i) * Right(i)$. You need to find out the maximum $IndexProduct(i)$ among all i .

Input Format

The first line contains an integer N , the number of integers. The next line contains the N integers describing the list $a[1..N]$.

Constraints

$$1 \leq N \leq 10^5$$

$$1 \leq a_i \leq 10^9$$

Output Format

Output the maximum $IndexProduct$ among all indices from 1 to N .

Sample Input

```
5
5 4 3 4 5
```

Sample Output

```
8
```

Explanation

We can compute the following:

$$IndexProduct(1) = 0$$

$$IndexProduct(2) = 1 \times 5 = 5$$

$$IndexProduct(3) = 2 \times 4 = 8$$

$$IndexProduct(4) = 1 \times 5 = 5$$

$$IndexProduct(5) = 0$$

The largest of these is 8, so it is the answer.

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Submissions: 2323

Max Score: 100

Difficulty: Medium

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```
1 import java.io.*;
2 import java.util.*;
3 import java.text.*;
4 import java.math.*;
5 import java.util.regex.*;
6
7 public class Solution {
8
9     public static void main(String[] args) {
10         /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
11     }
12 }
```

Line: 1 Col: 1

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