Assignment: Maximum Pairwise Product

You have not submitted. You must earn 1/1 points to pass.

Deadline Pass this assignment by June 5, 11:59 PM PDT

Instructions

My submission

Discussions

Introduction and Learning Outcomes

In this assignment and the next videos and readings, you will ...

1. Implement a program for a given computation problem.
2. Find out that it is slow: on large datasets, it works for too long.
3. Implement a more efficient program that is able to process even massive datasets in less than one second.
4. Use stress testing to locate and fix a bug in the program.

Problem Description

Problem

Given a sequence of non-negative integers $a_0, \ldots, a_{n-1}$, find the maximum pairwise product, that is, the largest integer that can be obtained by multiplying two different elements from the sequence (or, more formally, $\max_{0 \le i \ne j \le n-1} a_i a_j$).

Different elements here mean a_i and a_j with $i \ne j$ (it can be the case that $a_i = a_j$).

Input format

The first line of the input contains an integer n. The next line contains n non-negative integers $a_0, \ldots, a_{n-1}$ (separated by spaces).

Constraints

$2 \leq n \leq 2 \cdot 10^5; 0 \leq a_0, \ldots, a_{n-1} \leq 10^5$.

Output format

Output a single number — the maximum pairwise product.

Sample 1

Input:

```
3
1 2 3
```

Output:

```
6
```

Explanation:

$6 = 2 \times 3$

Sample 2

Input:

```
10
7 5 14 2 8 8 10 1 2 3
```

Output:

```
140
```

Explanation:

$140 = 14 \times 10$

Sample 3

Input:

```
5
4 6 2 6 1
```

Output:

```
36
```

Starter files

max_pairwise_product.py

MaxPairwiseProduct.java

max_pairwise_product.cpp

What To Do

In the next sequence of videos and readings, we will go through the process of solving this problem together.

How to submit

When you're ready to submit, you can upload files for each part of the assignment on the "My submission" tab.