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PAINLESS

MaxProductOfThree

START

Maximize $A[P] * A[Q] * A[R]$ for any triplet (P, Q, R) .Programming language: C++

A non-empty zero-indexed array A consisting of N integers is given. The *product* of triplet (P, Q, R) equates to $A[P] * A[Q] * A[R]$ ($0 \leq P < Q < R < N$).

For example, array A such that:

$A[0] = -3$
 $A[1] = 1$
 $A[2] = 2$
 $A[3] = -2$
 $A[4] = 5$
 $A[5] = 6$

contains the following example triplets:

- $(0, 1, 2)$, product is $-3 * 1 * 2 = -6$
- $(1, 2, 4)$, product is $1 * 2 * 5 = 10$
- $(2, 4, 5)$, product is $2 * 5 * 6 = 60$

Your goal is to find the maximal product of any triplet.

Write a function:

```
int solution(vector<int> &A);
```

that, given a non-empty zero-indexed array A , returns the value of the maximal product of any triplet.

For example, given array A such that:

$A[0] = -3$
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 $A[3] = -2$
 $A[4] = 5$
 $A[5] = 6$

the function should return 60, as the product of triplet $(2, 4, 5)$

Sieve of
Eratosthenes

Lesson 12

Euclidean
algorithm

Lesson 13

Fibonacci
numbers

Lesson 14

Binary search
algorithm

Lesson 15

Caterpillar
method

Lesson 16

Greedy
algorithms

Lesson 17

Dynamic
programming

Lesson 90

Tasks from
Indeed Prime
2016 challenge

Lesson 99

Future training

is maximal.

Assume that:

- N is an integer within the range [3..100,000];
- each element of array A is an integer within the range [-1,000..1,000].

Complexity:

- expected worst-case time complexity is $O(N \cdot \log(N))$;
- expected worst-case space complexity is $O(1)$, beyond input storage (not counting the storage required for input arguments).

Elements of input arrays can be modified.

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Contact us:

For customer support queries:

UK +44 (0) 208 970 78 68

US 1-415-466-8085
support@codility.com

For sales queries:

UK +44 (0) 208 970 78 67

US 1-415-466-8085
sales@codility.com

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