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codility

Training center

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Demo ticket

Session

ID: demoQMJZN7-UGK
Time limit: 120 min.

Status: closed

Created on: 2014-03-17 00:00 UTC
Started on: 2014-03-17 00:00 UTC
Finished on: 2014-03-17 00:25 UTC

Tasks in test

Task score

Test score

?

100%

100 out of 100 points

EASY

1. MaxProductOfThree

Maximize A[P] * A[Q] * A[R] for any triplet (P, Q, R).

score: 100 of 100

Task description

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 ≤ 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
  A[1] = 1
  A[2] = 2
  A[3] = -2
  A[4] = 5
  A[5] = 6
```

the function should return 60, as the product of triplet (2, 4, 5) is maximal.
Assume that:

- N is an integer within the range [3..100,000];

Solution

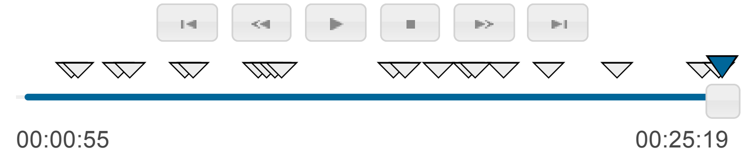
Programming language used: C++

Total time used: 25 minutes ?

Effective time used: 25 minutes ?

Notes: correct functionality and scalability

Task timeline ?



00:00:55

00:25:19

Code: 00:25:19 UTC, cpp, final, score: **100.00**

```
// you can also use includes, for example:
#include <algorithm>
int solution(vector<int> &A) {
    int len = A.size();

    sort(A.begin(), A.end());

    return max(A.front() * A[1] * A.back(), A[len-3] * A[len-2] * A.back());
}
```

Analysis ?

Detected time complexity:
O(N * log(N))

- each element of array A is an integer within the range [−1,000..1,000].

Complexity:

- expected worst-case time complexity is O(N*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.

test	time	result
example example test	0.020 s.	**OK**
one_triple three elements	0.020 s.	**OK**
simple1 simple tests	0.020 s.	**OK**
simple2 simple tests	0.020 s.	**OK**
small_random random small, length = 100	0.020 s.	**OK**
medium_range -1000, -999, ... 1000, length = ~1,000	0.020 s.	**OK**
medium_random random medium, length = ~10,000	0.020 s.	**OK**
large_random random large, length = ~100,000	0.040 s.	**OK**
large_range 2000 * (-10..10) + [-1000, 500, -1]	0.030 s.	**OK**
extreme_large (-2, .., -2, 1, .., 1) and (MAX_INT)..(MAX_INT), length = ~100,000	0.040 s.	**OK**

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