Codility_

Screen Report: Anonymous

Test Name:

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Summary Timeline

Tasks summary

Task	Effective time spent	Score
Triangle C++ ⚠	4 min	100%

Total score

Tasks Details

Easy

1. Triangle

Determine whether a triangle can be built from a given set of edges.

Task Score	Correctness	Performance
100%	100%	100%

Task description

An array A consisting of N integers is given. A triplet (P, Q, R) is *triangular* if 0 ≤ P < Q < R < N and:

- A[P] + A[Q] > A[R],
- A[Q] + A[R] > A[P],
- A[R] + A[P] > A[Q].

For example, consider array A such that:

```
A[0] = 10    A[1] = 2    A[2] = 5
A[3] = 1     A[4] = 8    A[5] = 20
```

Triplet (0, 2, 4) is triangular.

Write a function:

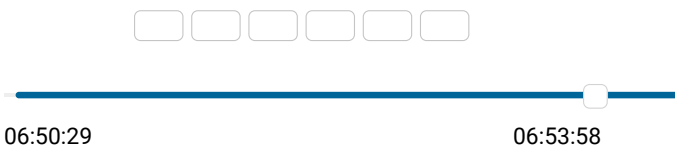
```
int solution(vector<int> &A);
```

that, given an array A consisting of N integers, returns 1 if there exists a triangular triplet for this array and returns 0 otherwise.

Solution

Programming language used:	C++
Time spent on task:	4 minutes
Notes:	*not defined yet*

Task timeline



Code: 06:53:58 UTC, cpp, final, score: **100** show code in pop-up

For example, given array A such that:

```
A[0] = 10    A[1] = 2    A[2] = 5
A[3] = 1     A[4] = 8    A[5] = 20
```

the function should return 1, as explained above. Given array A such that:

```
A[0] = 10    A[1] = 50    A[2] = 5
A[3] = 1
```

the function should return 0.

Write an **efficient** algorithm for the following assumptions:

- N is an integer within the range [0..100,000];
- each element of array A is an integer within the range [−2,147,483,648..2,147,483,647].


```cpp
// you can use includes, for example:
#include <algorithm>
#include <functional>

// you can write to stdout for debugging purposes,
// cout << "this is a debug message" << endl;

int solution(vector<int> &A) {
    // Implement your solution here

    if(A.size() < 3)
    {
        return 0;
    }

    // First sort the array in descending order
    vector<int> sortedA(A);

    std::sort(sortedA.begin(), sortedA.end(), std:

    for(int i = 0; i < sortedA.size()-2; i++)
    {
        long long int elm1{sortedA[i]};
        long long int elm2{sortedA[i+1]};
        long long int elm3{sortedA[i+2]};
        if(elm1 < elm2 + elm3 && elm2 < elm1 + elm
        {return 1;}
    }
    return 0;
}
```

Analysis summary

The solution obtained perfect score.

Analysis

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

expand all	Example tests	
▶	example example, positive answer, length=6	✓ OK
▶	example1 example, answer is zero, length=4	✓ OK
expand all	**Correctness tests**	
▶	extreme_empty empty sequence	✓ OK
▶	extreme_single 1-element sequence	✓ OK
▶	extreme_two_elems 2-element sequence	✓ OK
▶	extreme_negative1 three equal negative numbers	✓ OK
▶	extreme_arith_overflow1 overflow test, 3 MAXINTs	✓ OK
▶	extreme_arith_overflow2 overflow test, 10 and 2 MININTs	✓ OK

▶	extreme_arith_overflow3 overflow test, 0 and 2 MAXINTs	✓ OK
▶	medium1 chaotic sequence of values from [0..100K], length=30	✓ OK
▶	medium2 chaotic sequence of values from [0..1K], length=50	✓ OK
▶	medium3 chaotic sequence of values from [0..1K], length=100	✓ OK

expand all **Performance tests**

▶	large1 chaotic sequence with values from [0..100K], length=10K	✓ OK
▶	large2 1 followed by an ascending sequence of ~50K elements from [0..100K], length=~50K	✓ OK
▶	large_random chaotic sequence of values from [0..1M], length=100K	✓ OK
▶	large_negative chaotic sequence of negative values from [-1M..-1], length=100K	✓ OK
▶	large_negative2 chaotic sequence of negative values from [-10..-1], length=100K	✓ OK
▶	large_negative3 sequence of -1 value, length=100K	✓ OK