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Demo ticket

Session

ID: demoASEB2V-42A
 Time limit: 120 min.

Status: closed

Created on: 2014-08-26 20:40 UTC
 Started on: 2014-08-26 20:41 UTC
 Finished on: 2014-08-26 20:48 UTC

Tasks in test

1 | Triangle

Correctness

100%

Performance

100%

Task score

100%

Test score

100%

100 out of 100 points

EASY

1. Triangle

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

score: 100 of 100



Task description

A zero-indexed array A consisting of N integers is given. A triplet (P, Q, R) is *triangular* if $0 \leq P < Q < R < N$ 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:

```
def solution(A)
```

that, given a zero-indexed array A consisting of N integers, returns 1 if there exists a triangular triplet for this array and returns 0 otherwise. 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. Assume that:

Solution

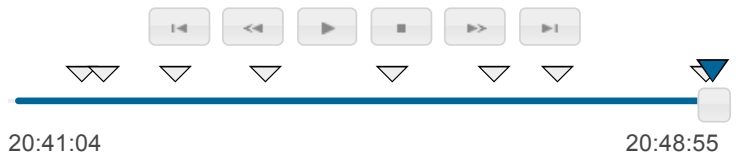
Programming language used: Python

Total time used: 8 minutes

Effective time used: 8 minutes

Notes: correct functionality and scalability

Task timeline



Code: 20:48:55 UTC, py, final, score: 100.00

```
1 # you can use print for debugging purposes, e.g.
2 # print "this is a debug message"
3
4 def solution(A):
5     n = len(A)
6     A.sort()
7     for i in range(1, n-1):
8         found = 0
9         if A[i-1] + A[i] > A[i+1]:
```

- N is an integer within the range [0..1,000,000];
- each element of array A is an integer within the range [−2,147,483,648..2,147,483,647].

Complexity:

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

Elements of input arrays can be modified.

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```
10         found += 1
11         if A[i] + A[i+1] > A[i-1]:
12             found += 1
13         if A[i+1] + A[i-1] > A[i]:
14             found += 1
15         if found == 3:
16             return 1
17
18     return 0
```

Analysis



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

test	time	result
Example tests		
example example, positive answer, length=6	0.064 s	OK
example1 example, negative answer, length=4	0.064 s	OK
example2 example, positive answer	0.060 s	OK
example_grouped example, answer is zero	0.064 s	OK
Correctness tests		
extreme_empty empty sequence + [5,3,3]	0.060 s	OK
extreme_single 1-element sequence + [5,3,3]	0.064 s	OK
extreme_two_elems 2-element sequence + [5,3,3]	0.064 s	OK
extreme_negative1 three equal negative numbers	0.060 s	OK
extreme_arith_overflow1 overflow test, 3 MAXINTs + [5,3,3]	0.060 s	OK
extreme_arith_overflow2 overflow test, 10 and 2 MININTs + [5,3,3]	0.060 s	OK
extreme_arith_overflow3 overflow test, 0 and 2 MAXINTs + [5,3,3]	0.064 s	OK
medium1 chaotic sequence of values from [0..100K], length=30 + [1,5,10]	0.060 s	OK
medium2 chaotic sequence of values from [0..1K], length=50 + [1,5,10]	0.060 s	OK
medium3 chaotic sequence of values from [0..1K], length=100 + [1,5,10]	0.064 s	OK
Performance tests		
large1 chaotic sequence with values from [0..100K], length=10K + [1,5,10]	0.060 s	OK
large2 1 followed by an ascending sequence of ~50K elements from [0..100K], length=~50K + [1,5,10]	0.072 s	OK
large_random chaotic sequence of values from [0..1M], length=100K + [1,5,10]	0.064 s	OK
large_negative chaotic sequence of negative values from [-1M..-1], length=100K + [1,5,10]	0.068 s	OK
large_negative2 chaotic sequence of negative values from [-10..-1], length=100K + [5,3,3]	0.064 s	OK
large_negative3 sequence of -1 value, length=100K + [5,3,3]	0.064 s	OK

