Codility_

CodeCheck Report: trainingZAKBDX-AW8

Test Name:

Check out Codility training tasks

Summary Timeline

Tasks summary

Task	Time spent	Score
PassingCars ⚠ C#	1 min	100%

Total score

100%

Tasks Details

Easy

1. PassingCars

Count the number of passing cars on the road.

Task Score	Correctness	Performance
100%	100%	100%

Task description

A non-empty array A consisting of N integers is given. The consecutive elements of array A represent consecutive cars on a road.

Array A contains only 0s and/or 1s:

- 0 represents a car traveling east,
- 1 represents a car traveling west.

The goal is to count passing cars. We say that a pair of cars (P, Q), where 0 ≤ P < Q < N, is passing when P is traveling to the east and Q is traveling to the west.

For example, consider array A such that:

```
  A[0] = 0
  A[1] = 1
  A[2] = 0
```

Solution

Programming language used:	C#
Total time used:	1 minutes
Effective time used:	1 minutes
Notes:	*not defined yet*

Task timeline

09:34:23 09:34:49

```
A[3] = 1
A[4] = 1
```

We have five pairs of passing cars: (0, 1), (0, 3), (0, 4), (2, 3), (2, 4).

Write a function:

```
class Solution { public int solution(int[] A); }
```

that, given a non-empty array A of N integers, returns the number of pairs of passing cars.

The function should return −1 if the number of pairs of passing cars exceeds 1,000,000,000.

For example, given:

```
A[0] = 0
A[1] = 1
A[2] = 0
A[3] = 1
A[4] = 1
```

the function should return 5, as explained above.

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

- N is an integer within the range [1..100,000];
- each element of array A is an integer that can have one of the following values: 0, 1.

Code: 09:34:48 UTC, cs, final, score: **100**

show code in pop-up

```
using System;
using System.Collections.Generic;

/* Lesson 4.4 - Missing Integer
 * Paulo Santos
 * 24.Nov.2022
 */
class Solution {
    public int solution(int[] A) {

                /*
                 * Check the inputs
                 */
        if (A == null)
            throw new ArgumentNullException("A is

        /*
         * Separate the cars going left
         * from the cars going right
         */
        var zeros = new Queue<int>();
        var ones  = new Queue<int>();
        for(var i = A.Length - 1; i >= 0; i--) {
            if (A[i] == 0) zeros.Enqueue(i);
            if (A[i] == 1) ones.Enqueue(i);
        }

        /*
         * Compute the possiblities
         */
        var ans = 0; // answer to be given
        var cnt = 0; // counter
        while (zeros.Count > 0) {
            var z = zeros.Peek();
            while ((ones.Count > 0) &&
                   (z < ones.Peek())) {
                cnt++;
                ones.Dequeue();
            }
            ans += cnt;

            if (ans > 1000000000)
                return -1;

            zeros.Dequeue();
        }
        return ans;
    }
}
```

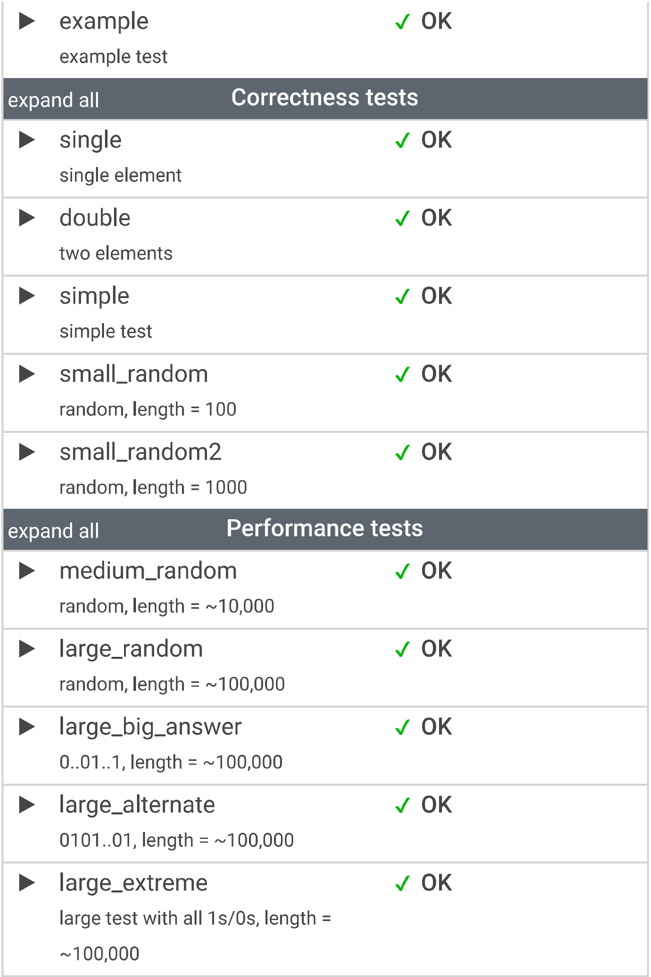
Analysis summary

The solution obtained perfect score.

Analysis

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

expand all **Example tests**



▶	example example test	✓ OK
expand all	Correctness tests	
▶	single single element	✓ OK
▶	double two elements	✓ OK
▶	simple simple test	✓ OK
▶	small_random random, length = 100	✓ OK
▶	small_random2 random, length = 1000	✓ OK
expand all	Performance tests	
▶	medium_random random, length = ~10,000	✓ OK
▶	large_random random, length = ~100,000	✓ OK
▶	large_big_answer 0..01..1, length = ~100,000	✓ OK
▶	large_alternate 0101..01, length = ~100,000	✓ OK
▶	large_extreme large test with all 1s/0s, length = ~100,000	✓ OK