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PAINLESS

PassingCars

START

Count the number of passing cars on the road.

Programming language: C++

A non-empty zero-indexed 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 $0 \leq P < Q < N$, 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
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:

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

that, given a non-empty zero-indexed 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
```

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

$A[2] = 0$

$A[3] = 1$

$A[4] = 1$

the function should return 5, as explained above.

Assume that:

- 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.

Complexity:

- expected worst-case time complexity is $O(N)$;
- 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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