# Positive Sum Intervals (PSI)

## Description

A positive sum interval (PSI) of an array is a consecutive subsequence of the array such that the sum of all elements in the subsequence is positive. For example, {2, -2, 3, -2} is a PSI of the array {1, 2, -2, 3, -2, -2, 3}, but {2, -2, 3, -2, -2} is not.

PSI is very useful, but you are not going to use it here. Instead, in this lab, you are to count the number of PSIs of a given integer array.

## Input

The first line contains an integer N, which is the number of elements in the array. The second line contains N integers. All integers are within [-10000, 10000].

## Output

Output the number of PSIs of the given integer array.

## Sample Input 1

4

1 -2 3 -2

## Sample Output 1

5

## Explanation 1:

{1}, {1, -2, 3}, {-2, 3}, {3}, {3, -2} are the PSIs.

## Sample Input 2

7

1 2 -2 3 -2 -2 3

## Sample Output 2

16

## Data Scale and Grading:

There are 10 test cases in total. The N's in the test cases are 10, 20, 30, 400, 500, 6000, 7000, 8000, 90000, 100000 respectively. Therefore,

1. If the time complexity of your algorithm is higher than $O(N^2)$, you will pass at most 5 test cases, and obtain at most 70% of the total mark.

2. If your complexity is $O(N^2)$, you will pass at most 8 test cases, and obtain at most100% of the total mark.
3. If your complexity is not higher than $O(N^{1.5})$, for example, $O(N^{4/3})$, O(NlogN), or O(N), you will obtain at most 110% of the total mark.

**Hint**

1. $O(N^3)$ solution: exhaustion
2. $O(N^2)$ solution: exhaustion (smart)
3. $O(N^{1.5})$ solution: segmented / skipping linked list (still remember?)
4. O(NlogN) solution: merge sort (or balanced trees if you know)