William and Summation

Time limit: 1.0s **Memory limit:** 256M

William is given an array of N integers $a_1, a_2, \ldots, a_n$. He then must pick one contiguous segment $[L, R]$ $(1 \leq L \leq R \leq N)$ and multiply all values on that segment $(a_L, \ldots, a_R)$ by -1.

His goal is such that after modifying this segment, the sum of the prefix sums is minimized. This value can be represented as:

$$\sum_{i=1}^{N} \sum_{j=1}^{i} a_j$$

Output the minimal value attainable under the given terms.

Input Specification

The first line consists of a single integer N $(1 \leq N \leq 10^5)$.

The next line contains N space-separated integers $a_1, a_2, \ldots, a_N$ $(-1\,000 \leq a_i \leq 1\,000)$.

Subtask 1 [20%]

$1 \leq N \leq 2000$

Subtask 2 [80%]

No further constraints.

Output Specification

Output a single integer, the minimal value attainable of the expression outlined above.

Sample Input 1

```
4
1 -2 100 -5
```

Sample Output 1

```
-207
```

Explanation for Sample 1

If the segment $[3, 3]$ was modified our array will become: $[1, -2, -100, -5]$.

The prefix sum of the modified array is:

$[1, -1, -101, -106]$

Thus the answer would be the sum of the prefix sum of all elements:

$\text{ans} = 1 + (-1) + (-101) + (-106) = -207$

The value -207 is the minimum attainable answer.

Sample Input 2

```
5
-10 7 -2 -2 10
```

Sample Output 2

```
-78
```