Maximum Contiguous Sum of Circular Subsequence

Time limit: 1 sec

THIS IS DIFFERENT FROM THE ORIGINAL MCS PROBLEM IN THE EXERCISE

Given a sequence $A=a_1,a_2,a_3,\ldots,a_n$, a circular subsequence of **A** is a non-empty set of adjacent members of **A** where a_n is considered to be adjacent to a_1 . For example, where n = 8, $\langle a_7, a_8, a_1, a_2 \rangle$ is a circular subsequence. Please note that a normal subsequence is also a circular subsequence as well. Hence, $\langle a_3, a_4, a_5 \rangle$, $\langle a_6, a_7, a_8 \rangle$ and $\langle a_8, a_1 \rangle$ are all circular subsequences while $\langle a_1, a_3, a_5 \rangle$, $\langle a_7, a_8, a_2 \rangle$ are not.

We would like to find a circular subsequence of **A** such that the summation of the elements of that subsequence is maximal.

Input

- The first line of input contains one integers **N** indicating the size of the sequence **A**.
- The second line contains **N** integer a[i] $\left(-1\times10^3 \le a[i] \le 10^3\right)$ that indicates the elements of the sequence.

Input

- For 20% of the test-cases, 1 <= **N** <= 100
- For 50% of the test-cases, 1 <= **N** <= 15,000
- For 100% of the test-cases, 1 <= **N** <= 100,000

Output

The only line of the output must contain the summation of the maximal contiguous circular subsequence.

Example

Input	Output
4 1 -2 -3 1	2
15 1 2 -1 5 3 -8 -2 4 3 -4 -5 7 -1 -2 4	18
8 -1 -2 -2 -2 -2 -2 -2 -1	-1