Smart Thermostat (sensor)

Edoardo is getting interested in making his house *smarter*. For this reason, he has bought a smart thermostat, which measures the temperature in his room. Edoardo has gathered so far N measures V_i produced by the sensor and would like to calculate some statistics.

Figure 1: Edoardo's new smart thermostat.

However, the thermostat is not always able to produce a stable measurement: in the case of an unreliable reading, $V_i = -1$ is reported as a special value instead of the correct measure of the room's temperature.

The N measurements were all obtained at regular intervals in a single morning, starting just after switching on the heating system. For this reason, we are certain that during the whole morning the temperature of the room was non-decreasing.

Edoardo wants to fix the errors by changing all the unreliable measurements so that they respect the non-decreasing property (formally, $V_i \geq V_{i-1}$ for each $i = 1 \dots N-1$). What is the *minimum* sum of the measurements that he can get?

☞ Among the attachments of this task you may find a template file `sensor.*` with a sample incomplete implementation.

Input

The first line contains the only integer N, the number of measurements. The second line contains N integers V_i, the room temperature's measurements.

Output

You need to write a single line with an integer: the minimum sum of V Edoardo can get, after he changes all the wrong measurements (that is when $V_i = -1$).

Constraints

- $1 \leq N \leq 10^5$.
- $0 \leq V_i \leq 10^4$ or $V_i = -1$ for each $i = 0 \ldots N-1$.
- $V_0 \neq -1$.
- It is guaranteed that Edoardo can change the unreliable measurements in such a way that $V_{i-1} \leq V_i$ for each $i = 1 \ldots N-1$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points) Examples.

– **Subtask 2** (15 points) $N \leq 6$, $V_i \leq 10$.

– **Subtask 3** (15 points) $V_i \neq -1$ for each $i = 0 \ldots N-1$.

– **Subtask 4** (15 points) $V_i = -1$ for each $i = 1 \ldots N-1$.

– **Subtask 5** (25 points) $N \leq 1000$.

– **Subtask 6** (30 points) No additional limitations.

Examples

input	output
5 1 -1 2 3 -1	10

Explanation

In the **first sample case**, the minimum sum of V is obtained if Edoardo fixes the errors by setting $V_1 = 1$ and $V_4 = 3$; in this case $V = [1, 1, 2, 3, 3]$.