Problem Fence (fence)

Edoardo has a ranch in Pordenone, surrounded by tall mountains on three sides. Since his cows are always trying to escape, he built a fence on the fourth side, but soon realised that he does not need all of it. The fence consists of N wooden poles, indexed from 0 to $N-1$, and pole i has a height of H_i centimeters.

Figure 1: Edoardo's ranch

After removing some poles, the *robustness* of the remaining ones is the sum of $(j-i) \cdot min(H_i, H_j)$ over all $0 \le i < j < N$ such that poles i and j have not been removed and all those between them have been removed. Help Edoardo compute the maximum possible *robustness* over all possible choices of poles to remove.

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

Input

The first line contains the integer N: the number of poles. The second line contains N integers H_i: the height of the poles.

Output

You need to write a single line with an integer: the maximum possible *robustness* over all possible choices of poles to remove.

Constraints

- $2 \le N \le 200\,000$.
- $0 \le H_i \le 1\,000\,000\,000$ for each $i = 0 \ldots N-1$.

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** (17 points) $N \leq 20$.

– **Subtask 3** (30 points) $N \leq 5000$.

– **Subtask 4** (53 points) No additional limitations.

Examples

input	output
`4` `10 4 8 7`	`23`
`10` `5 4 18 11 19 14 21 7 0 10`	`114`

Explanation

In the **first sample case**, it is optimal to only remove pole 1. The *robustness* of the remaining poles $(0, 2, 3)$ is: $(2-0) \cdot min(H_0, H_2) + (3-2) \cdot min(H_2, H_3) = 2 \cdot min(10, 8) + 1 \cdot min(8, 7) = 23$.