

M. Merging Slimes

Problem ID: merge

In a certain RPG, there are n slimes lined up in a row, numbered from 1 to n from left to right. Each slime can be of water-type, fire-type, or elementless. The power of the i -th slime is represented by a signed integer a_i . Specifically:

- If $a_i > 0$, the slime is of water-type, and its power is a_i .
- If $a_i < 0$, the slime is of fire-type, and its power is $|a_i|$ (which is equal to $-a_i$).
- If $a_i = 0$, the slime is elementless, and its power is 0 (representing no energy or power value).

As a player, you will use a **water-type** magic to attack these slimes. The mana cost to attack a single slime is determined as follows:

- If its represented power $a_i > 0$, the mana cost is a_i .
- If its represented power $a_i \leq 0$ (meaning the slime is fire-type or elementless), the mana cost is 0.

To minimize the total mana cost, you can perform at most k merging operations before casting the magic:

- Select two adjacent slimes with represented powers a and b , and merge them into a single slime. The represented power of the newly merged slime will be $a + b$.

Note that if two slimes of opposite types and equal power are merged, they will neutralize each other, resulting in an elementless slime with a power of 0.

After performing at most k operations, you cast the magic. The total final cost will be the sum of the mana costs required to attack all remaining slimes.

Find the minimum possible total cost if you use an optimal strategy.

Input

The first line contains two integers n and k , representing the number of slimes and the maximum number of merging operations you can perform.

The second line contains n integers $a_1, a_2, \dots, a_n$, representing the initial represented powers of the slimes.

Constraints

- $1 \leq n \leq 3000$
- $0 \leq k < n$
- $-10^9 \leq a_i \leq 10^9$

Output

Output a single integer, representing the minimum possible total cost.

Sample Input 1

3 1 10 -10 5	5
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Sample Output 1

Sample Input 2

5 2 3 -5 4 -2 6	7
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Sample Output 2

Sample Input 3

4 2 5 -5 8 -8	0
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Sample Output 3

Notes

In the first sample, you can merge the first two slimes, a water-type slime of power 10 and a fire-type slime of power 10. They neutralize each other and become an elementless slime, so the row becomes $[0, 5]$. Attacking the elementless slime costs 0 mana and attacking the remaining water-type slime of power 5 costs 5 mana, for a total cost of $0 + 5 = 5$.

In the second sample, you can use your two operations on two disjoint pairs of adjacent slimes: merge the second and the third slimes into a fire-type slime of power 1 (since $-5 + 4 = -1$), and merge the fourth and the fifth slimes into a water-type slime of power 4 (since $-2 + 6 = 4$). The row becomes $[3, -1, 4]$, and the total cost is $3 + 0 + 4 = 7$. No strategy using at most 2 operations can do better.

In the third sample, you can merge the first two slimes and then the last two slimes. Each pair consists of slimes of opposite types with equal power, so both merges produce elementless slimes and the row becomes $[0, 0]$. Attacking them costs no mana at all, so the total cost is 0.

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