

Conga Line (Redux)

Time and memory limits: 1 second, 256 MB

Ümit and Kathryn are throwing an end-of-semester party. Their guests will form a conga line, standing one behind another and dancing through the house and garden.

Ümit thinks it looks untidy when neighbours in the line have very different heights. He wants to minimise the **sum of the absolute height differences between adjacent guests**.

Kathryn's family has a different concern. Every older family member must stand ahead of every younger family member, even if other guests stand between them.

There are N guests. Guests $1, 2, \dots, K$ are Kathryn's family members, numbered from oldest to youngest. Guest i has height H_i millimetres. All guests must join the line, with the family members appearing in the order $1, 2, \dots, K$ from front to back.

Determine the minimum possible sum.

Subtasks and constraints

Your program will be graded using many secret tests. Every test follows some rules:

- $1 \leq K \leq N \leq 1\,000\,000$.
- $1000 \leq H_i \leq 2200$ for all i .
- Guests may have the same height.

The secret tests are divided into subtasks. Your program must correctly solve **every test** within a subtask to earn the marks for that subtask:

- For Subtask 1 (10 marks), $K = N$.
- For Subtask 2 (15 marks), $H_1 \leq H_2 \leq \dots \leq H_K$.
- For Subtask 3 (20 marks), $\min(H_1, \dots, H_K) = 1000$ and $\max(H_1, \dots, H_K) = 2200$.
- For Subtask 4 (25 marks), $\max(H_1, \dots, H_K) = 2200$.
- For Subtask 5 (30 marks), no special rules apply.

Input

Your solution must read input and print output. We recommend using the solution templates (which you can find on the competition website) to help you with input and output.

The input follows a specific format:

- The 1st line contains the integers N and K .
- The next N lines each contain one integer. The i th of these lines contains H_i , the height of guest i in millimetres.

Output

Your program must output one integer: the minimum possible sum of the absolute height differences between adjacent guests in a valid conga line.

Sample input 1

3 2
2000
1200
1500

Sample output 1

800

Sample input 2

5 3
1900
1300
1500
1200
1600

Sample output 2

1000

Sample input 3

1 1
1700

Sample output 3

0

Explanation

- In the 1st sample case, one optimal order is guest 1, then guest 3, then guest 2. Their heights are 2000, 1500, 1200, so the total height difference is $500 + 300 = 800$. Guest 1 stands ahead of guest 2, as required.
- In the 2nd sample case, one optimal order is 1, 5, 4, 2, 3. Their heights are 1900, 1600, 1200, 1300, 1500, so the total height difference is $300 + 400 + 100 + 200 = 1000$. The family members appear in the required order 1, 2, 3.
- In the 3rd sample case, there is only one guest, so there are no adjacent pairs and the answer is 0.