Scenic Walkway (`walkway`)

The managers of Gardaland Theme Park are building a new attraction, consisting of a sequence of N chambers of horrors, each located at a different height of H_i meters. Together with the attraction, they also plan to build a scenic walkway following most of the chambers from the outside.

In order to maximise the visibility of the new attraction, they need to carefully plan the altitude at which to build the walkway. For this reason they hired Giorgio and William, who calculated that it would be best if at least K chambers were clearly visible from the walkway. Given a set of chambers, define its *spread* as the difference between the highest and the lowest chamber in the set. Find the smallest possible spread for a set of K chambers!

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

Input

The first line contains the two integers N and K. The second line contains N integers H_i.

Output

You need to write a single line with an integer: the smallest possible spread for a set of K chambers.

Constraints

- $2 \leq K \leq N \leq 1\,000\,000$.
- $0 \leq H_i \leq 1\,000\,000$ 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.
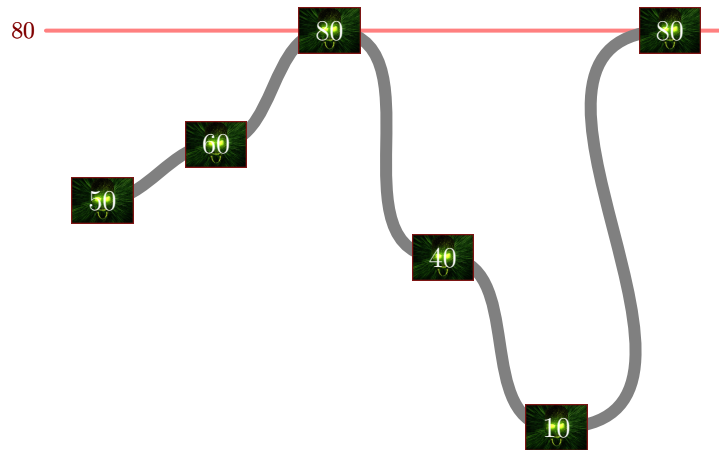
- **Subtask 1** [**5 points**]: Examples.
- **Subtask 2** [**30 points**]: $N \leq 10$.
- **Subtask 3** [**25 points**]: $N \leq 1000$, $K = 2$.
- **Subtask 4** [**20 points**]: $N \leq 1000$.
- **Subtask 5** [**20 points**]: No additional limitations.

Examples

input.txt	output.txt
6 2 50 60 80 40 10 80	0
10 3 67 90 22 79 95 89 76 21 65 99	6

Explanation

In the **first sample case** the set of chambers with lowest spread is $\{80, 80\}$.

In the **second sample case** the set of chambers with lowest spread is $\{90, 95, 89\}$.