Chess Tournament (`tournament`)

Tommaso just came to know that an important chess tournament will take place in Pisa in the next few days. Not having much free time, he can only watch one of the matches, so he wants to watch the most interesting match.

Figure 1: An interesting match at a chess tournament.

There are N players in the tournament numbered from 0 to $N-1$, and each player has a style S_i. During the tournament, every player will face everybody else exactly once. The interestingness of a match between player x and player y is given by $|S_x - S_y| + |x - y|$.

Help Tommaso find the interestingness of the most interesting match!

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

Input

The first line contains the integer N.

The second line contains N integers: the style S_i of player i, for $i = 0, 1, \ldots, N-1$.

Output

You need to output a single integer, the interestingness of the most interesting match.

Constraints

- $2 \leq N \leq 10^6$.
- $1 \leq S_i \leq 10^7$ for $i = 0, 1, \ldots, N-1$.

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** (33 points) $N \leq 5000$.

– **Subtask 3** (25 points) $S_i \leq S_{i+1}$ for each $i = 0, 1, \ldots, N-2$.

– **Subtask 4** (42 points) No additional limitations.

Examples

input	output
4 6 1 3 4	6
7 10 5 4 7 6 4 9	11

Explanation

In the **first sample case** there are 6 matches:

- the interestingness of the match between players 0 and 1 is 6;
- the interestingness of the match between players 0 and 2 is 5;
- the interestingness of the match between players 0 and 3 is 5;
- the interestingness of the match between players 1 and 2 is 3;
- the interestingness of the match between players 1 and 3 is 5;
- the interestingness of the match between players 2 and 3 is 2.

The maximum interestingness of a match is therefore 6.

In the **second sample case**, the interestingness of the match between players 0 and 5 is 11, which is the maximum.