

Frog and Flies

There are n flies standing on a line, the i^{th} one is at position x_i . There is a frog standing at position 0^{th} and he wants to eat all the flies. The frog is very lazy, so he just stands at one place and use his long tongue to catch all the flies.

However, when the frog catches a fly from a distance of a -unit length, the frog loses a unit of power. On the other hand, when a fly i^{th} staying at position x_i is caught, all flies on the left of it will move one-unit length to the left, and all flies on the right of it will move to the right one-unit length. In addition, the other flies are on the same place x_i are stunned and do not move.

When a fly moves to the position of the frog, the frog will eat the fly immediately without losing any power, and the other flies do not move since they do not know that.

Please calculate the minimum power needed for the frog to catch all the flies.

Input

The first line contains an integer $n(1 \leq n \leq 10^5)$ – the number of flies.

The second line contains n integers $x_1, x_2, \dots, x_n(1 \leq x_i \leq 10^9)$ – the positions of the flies (sorted in ascending order).

Output

The output contains only one integers – the minimum power.

Sample

MIDGES . INP	MIDGES . OUT
4 2 2 4 4	8