

You are given a sequence of numbers. You can apply the following operation on it any number of times: swap two **adjacent** numbers, then add 1 to the left one and subtract 1 from the right one.

For example if you apply this operation on the numbers (3, 7) you would get (6, 4).

What is the lexicographically smallest sequence that you can obtain in this way?

Input

The first line of the input file `shuffle.in` contains the length N of the sequence. After that the N numbers of the sequence follow.

Output

In the output file `shuffle.out` print the lexicographically smallest resulting sequence.

Constraints

$$1 \leq N \leq 100\,000$$

$$-1\,000\,000 \leq \text{numbers in the starting sequence} \leq 1\,000\,000$$

Time limit: 0.4 seconds

Memory limit: 256 MB

Examples

Input (<code>shuffle.in</code>)	Output (<code>shuffle.out</code>)
3 1 2 3	1 2 3
4 3 -5 4 2	-6 0 4 6