

Baltic OI '04 P3 - Sequence

Time limit: 2.0s **Memory limit:** 512M

Baltic Olympiad in Informatics: 2004 Day 1, Problem 3

A number sequence is given. Your task is to construct an increasing sequence that approximates the given one in the best way. The best approximating sequence is the sequence with the least total deviation from the given sequence.

More precisely, let $t_1, t_2, \dots, t_N$ be the given sequence. Your task is to construct an increasing sequence $z_1 < z_2 < \dots < z_N$.

The total deviation, defined as $|t_1 - z_1| + |t_2 - z_2| + \dots + |t_N - z_N|$, should be minimized.

Constraints

$$1 \leq N \leq 10^6$$

$$0 \leq t_i, |z_i| \leq 2 \times 10^9$$

Input Specification

The first line of input contains an integer N .

Each of the next N lines describes the given sequence t , where the $i + 1^{\text{th}}$ line corresponds to t_i .

Output Specification

The first line of output must contain the single integer – the minimal possible total deviation.

Each of the next N lines must describe the best approximating sequence z , where the $i + 1^{\text{th}}$ line corresponds to z_i .

If there are several solutions, your program can output any valid sequence with the least total deviation.

Sample Input

```
7
9
4
8
20
14
15
18
```

Sample Output

13
6
7
8
13
14
15
18