

Problem F: From-now-on minimum difference

Time Limit: 5 Sec Memory Limit: 256 MB

Submit: 465 Solved: 104

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Description

Yuki is a clever girl and she is good at mathematics. One day, she gets an array a of n integers: a_1, a_2, \dots, a_n . She wants to know the from-now-on minimum difference of a_1, a_2, \dots, a_{n-1} , and your task is to help her to calculate them. The **from-now-on minimum difference** of a_i , denoted by h_i , is defined as: $h_i = \min_{j>i} |a_j - a_i|$.

Input

The first line contains one integer: n ($2 \leq n \leq 2 \times 10^6$). The second line contains n space-separated integers: a_1, a_2, \dots, a_n — elements of the array a ($1 \leq a_i \leq 10^9$).

Output

Print one line with $n - 1$ space-separated intergers: h_1, h_2, \dots, h_{n-1} .

Sample Input

```
5
1 2 3 4 5
```

Sample Output

```
1 1 1 1
```

HINT

You may solve this problem using some ~~advanced data structures~~. However, it can be solved in a simple and efficient way merely by **sorting algorithm** and **linked list**.

Please note that the size of input might be really large, so you might want to use an efficient way to read the input data.

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