Contest Results (`results`)

Francesco and James have just participated in the final competition of the Italian Olympiad in Ice cream. Both have seen the results and now they have to produce the rankings to send to the press for publication.

Both assign the same position to participants with the same score, but:

- Francesco assigns tied positions as if they were a single person, so if there are exactly X people in position K, the next will be in position $K + 1$. For example, if two participants are tied for first place, then the next one will be in second place

- James counts participants with the same score separately, so if there are exactly X people tied for place K, the next participant will be in position $K + X$. For example, if two participants are tied for first place, then the next one will be in third place

Figure 1: The ranking produced by James.

You bought the newspaper, but it does not tell you who produced the rankings. You wonder what the ranking would look like if the other person had produced it.

Write a program that transforms the ranking from one of the two ways to the other.

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

Input

The input file consists of:

- a line containing integer N.

- a line containing the N integers $R_0, \ldots, R_{N-1}$, the published ranking.

Output

The output file must contain a single line consisting of the N integers $P_0, \ldots, P_{N-1}$, the ranking in the other version.

Constraints

- $1 \leq N \leq 100\,000$.
- $1 \leq R_i \leq 100\,000$ for each $i = 0 \ldots N - 1$.
- $R_{i-1} \leq R_i$ for each $i = 1 \ldots N - 1$.
- R is always one of the two types of ranking.
- It can be proven that, under the given constraints, the ranking of the other person can always be uniquely determined.

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** (10 points)　　　R contains at most two distinct values.

– **Subtask 3** (20 points)　　　All rankings are produced by James.

– **Subtask 4** (20 points)　　　All rankings are produced by Francesco.

– **Subtask 5** (50 points)　　　No additional limitations.

Examples

input	output
10 1 1 1 4 4 6 7 8 8 10	1 1 1 2 2 3 4 5 5 6
8 1 1 1 2 3 3 3 4	1 1 1 4 5 5 5 8
2 1 1	1 1

Explanation

In the **first sample case** the ranking was produced by James.

In the **second sample case**, shown in the image above, the ranking was produced by Francesco.

In the **third sample case** the ranking is the same in both ways.