A Math Contest P3 - LIS Reconstruction

Time limit: 1.0s   **Memory limit:** 256M

Consider a permutation of the first N positive integers, $p_1, p_2, \ldots, p_N$. Define a_i as the length of the longest increasing subsequence of $p_1, p_2, \ldots, p_i$.

Given $a_1, a_2, \ldots, a_n$, find the lexicographically minimal possible permutation $p_1, p_2, \ldots, p_N$, or determine that no such permutation exists.

Constraints

$1 \leq N \leq 2 \times 10^5$

$1 \leq a_i \leq N$

Input Specification

The first line contains an integer, N.

The second line contains N space-separated integers, $a_1, a_2, \ldots, a_N$.

Output Specification

If there is no sequence p that can produce sequence a, output -1; otherwise, output one line containing N positive integers, representing the lexicographically minimal permutation $p_1, p_2, \ldots, p_N$.

Sample Input 1

```
3
1 2 2
```

Sample Output 1

```
1 3 2
```

Explanation for Sample Output 1

Note that

- The longest increasing subsequence of p_1 is 1.

- The longest increasing subsequence of p_1, p_2 is $1, 3$.
- One of the longest increasing subsequences of p_1, p_2, p_3 is $1, 2$.

Sample Input 2

```
3
1 2 1
```

Sample Output 2

```
-1
```

Explanation for Sample Output 2

No possible permutation p exists.