

D. Distinct Numbers

Problem ID: distinct

You are given an array a of length n . For each k from 2 to n , find the maximum distance between two distinct elements within any subarray of length k .

Formally, for each k , we want to find:

$$\max\{j - i \mid 1 \leq i < j \leq n, j - i < k, a_i \neq a_j\}$$

If no such pair of distinct elements exists for a given k , the answer is -1 .

Input

The first line contains a single integer n , representing the length of the array.

The second line contains n integers $a_1, a_2, \dots, a_n$, representing the elements of the array.

Constraints

- $2 \leq n \leq 3 \times 10^5$
- $1 \leq a_i \leq 10^9$

Output

Output $n - 1$ space-separated integers on a single line. The i -th integer should be the answer for $k = i + 1$.

Sample Input 1	Sample Output 1
4 1 2 1 2	1 1 3

Sample Input 2	Sample Output 2
5 3 3 3 3 3	-1 -1 -1 -1

Sample Input 3	Sample Output 3
5 1 2 3 4 5	1 2 3 4