B. Distances to Zero

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given the array of integer numbers $a_0, a_1, \ldots, a_{n-1}$. For each element find the distance to the nearest zero (to the element which equals to zero). There is at least one zero element in the given array.

Input

The first line contains integer n ($1 \le n \le 2 \cdot 10^5$) — length of the array a. The second line contains integer elements of the array separated by single spaces ($-10^9 \le a_i \le 10^9$).

Output

Print the sequence $d_0, d_1, \ldots, d_{n-1}$, where d_i is the difference of indices between i and nearest j such that $a_j = 0$. It is possible that $i = j$.

Examples

input
9 2 1 0 3 0 0 3 2 4
output
2 1 0 1 0 0 1 2 3

input
5 0 1 2 3 4
output
0 1 2 3 4

input
7 5 6 0 1 -2 3 4
output
2 1 0 1 2 3 4