Problem H. Sketch

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

Given a sequence a consisting of integers $a_1, \ldots, a_n$, consider all its non-decreasing subsequences of length k. Among all of these take the one with smallest last element. We denote the value of this element with s_k.

The sequence $s(a) = s_1, \ldots, s_l$ is a *sketch* for sequence a, where l is the length of the longest non-decreasing subsequence of a.

Building a sketch of the sequence is a standard task while finding the length of the longest non-decreasing subsequence. Here we consider an opposite problem: given a sketch with some missing entries, find any sequence producing this sketch.

Formally, you are given a sequence $t_1, \ldots, t_k$ where each element is either a positive integer or -1. You have to find a sequence $a_1, \ldots, a_n$ with each element being an integer between 1 and m, inclusive, satisfying the following properties: length of the sketch of a should be equal to k, and for each index i between 1 and k, if $t_i \neq -1$, then $s_i = t_i$ should hold.

Input

First line contains three integers k, n, m ($1 \le k \le 300\,000$, $1 \le n \le 300\,000$, $1 \le m \le 10^9$), the length of the sketch, the length of the desired sequence and the upper bound on element values respectively.

Next line contains k numbers $t_1, \ldots, t_k$ ($1 \le t_i \le m$ or $t_i = -1$), the sketch itself.

Output

If a sequence with such sketch exists, output the elements of a desired sequence. In case of multiple answers you may output any of them.

If no valid sequence exists, output a single integer -1.

Examples

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

Note

Sketch of the answer sequence in example 2: 3 4 7.