

Problem H. Permutation Arrangement

Input file: *standard input*
Output file: *standard output*
Time limit: 1 second
Memory limit: 1024 mebibytes

You are given an array a of length N . Each element of a is either -1 or an integer between 1 and N . Each number between 1 and N appears at most once in a . Also, no two adjacent elements of a differ by exactly 1 .

You are to find the lexicographically smallest permutation p of $\{1, 2, \dots, N\}$ satisfying the following.

- if $a_i \neq -1$, then $a_i = p_i$ ($1 \leq i \leq N$);
- $|p_i - p_{i+1}| \neq 1$ ($1 \leq i \leq N - 1$).

Input

The first line contains one integer, N .

The second line contains space-separated N integers: elements of the array a .

- $1 \leq N \leq 200\,000$
- $1 \leq a_i \leq N$ or $a_i = -1$ ($1 \leq i \leq N$)
- $a_i \neq a_j$ or $a_i = -1$ ($1 \leq i < j \leq N$)
- $|a_i - a_{i+1}| \neq 1$ ($1 \leq i \leq N - 1$)

Output

If there is no permutation p satisfying the condition, then output a single integer -1 .

Otherwise, output the lexicographically smallest permutation p .

Examples

<i>standard input</i>	<i>standard output</i>
10 3 -1 10 -1 8 -1 -1 -1 -1 -1	3 1 10 2 8 4 6 9 5 7
2 -1 -1	-1