Tree

There is a rooted tree with N nodes, indexed from 0 to $N-1$. Node 0 is the root. For $1 \leq i \leq N-1$, the parent of node i is $F[i]$.

In this task, you are removing nodes from the tree. In each step, you select a leaf node, and remove it from the tree. You repeat the process until there is only one node left in the tree (and it is the root).

The indices of the nodes removed are recorded in a sequence in their order of removal. Among all the possible orders of removing leaves, you need to compute the lexicographically largest sequence that could be obtained.

Implementation Details

You need to implement the following function:

```
std::vector<int> compute(int N, std::vector<int> F);
```

- N: the number of nodes in the tree.
- F: an array of length N. For each $1 \leq i \leq N-1$, $F[i]$ is the parent of node i. $F[0]$ is meaningless, and will be always set to -1.
- This function should return an array of length $N-1$, representing the lexicographically largest sequence among all possible orders.
- This function will be called exactly once.

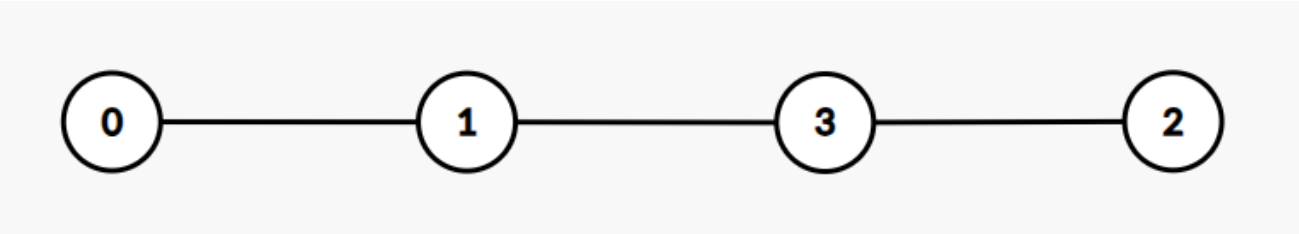
Examples

Example 1

Consider the following call:

```
compute(4, {-1, 0, 3, 1});
```

The corresponding tree is shown below:



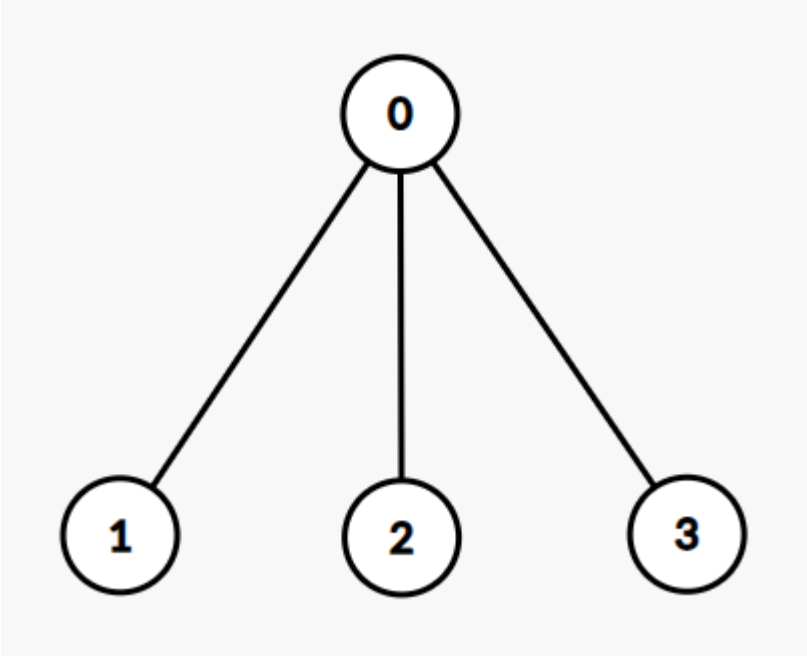
Initially, only node 2 is a leaf. After removing node 2, node 3 becomes a leaf. After removing node 3, node 1 becomes a leaf. Therefore, there is only one possible sequence of indices: $2, 3, 1$. Thus, the function should return $\{2, 3, 1\}$.

Example 2

Consider the following call:

```
compute(4, {-1, 0, 0, 0});
```

The corresponding tree is shown below:



Initially, nodes 1, 2, and 3 are all leaves. The lexicographically largest sequence among possible records is $3, 2, 1$. Thus, the function should return $\{3, 2, 1\}$.

Constraints

- $2 \leq N \leq 5 \times 10^5$;
- The length of F is exactly N;
- $F[0] = -1$, $0 \leq F[i] \leq N - 1$ (for all $1 \leq i \leq N - 1$);
- The tree described by F is guaranteed to be valid, i.e., it is connected and acyclic.

Subtasks

1. (1 point): $N = 2$.
2. (12 points): $N \leq 10$.
3. (3 points): $F[i] = 0$ (for all $1 \leq i \leq N - 1$).
4. (13 points): $F[1], F[2], \cdots, F[N-1]$ are pairwise distinct.
5. (19 points): $N \leq 200$.
6. (31 points): $N \leq 2\,000$.
7. (21 points): No additional constraints.

Sample Grader

The sample grader reads the input in the following format:

- Line 1: N
- Line 2: $F[1]\ F[2]\ \cdots\ F[N-1]$

The sample grader prints your answer in the following format:

- Line 1: If the length of your answer is not $N - 1$, this line contains only the integer -1; otherwise, it contains $N - 1$ integers representing your answer.