Hello, **2024101067**.

Subtree Minimum Query in a Binary Tree

Submit solution

All submissions
Best submissions

Points: 100 (partial)
Time limit: 1.0s
Memory limit: 256M

Allowed languages
C

Given a binary tree, for every node from `0` to `n - 1` find the node with the least value present in the subtree rooted at that node. The tree is represented by a **parent array**, where the index represents a node and the value at that index represents its parent's index. The root node is indicated by a parent value of `-1`.

Input Format

- The **first line** contains a single integer `n`, the number of nodes in the tree.
- The **second line** contains `n` space-separated integers representing the parent array. For each node `i`:
  - If the value is `-1`, then `i` is the root.
  - Otherwise, the value represents the index of node `i`'s parent.

Output Format

Print `n` integers where the i'th integer represents the node with the least value present in the subtree of i'th node

Constraints:

- Batch 1: 1<=N<=1e3
- Batch 2: 1<=N<=1e5

Samples

Input

```
1 3 1 -1 3
```

Output

```
0 0 2 0 4
```
Copy

Input

```
6
-1 0 0 1 1 2
```
Copy

Output

```
0 1 2 3 4 5
```
Copy

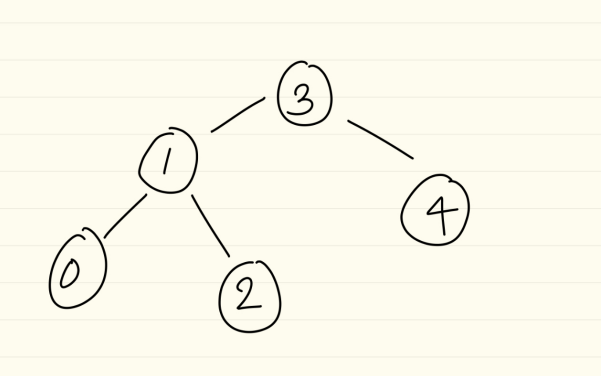
Input

```
6
3 4 4 5 5 -1
```
Copy

Output

```
0 1 2 0 1 0
```
Copy

Binary Tree for Sample 1



Clarifications

Request clarification

Hello, **2024101067**.