Min in Subtree of a Node

April 1, 2024

1 Problem Statement

You are given a binary tree rooted at a node u. You have to find for all nodes v, minimum of all the values you encounter in subtree of v where the values associated with each node is given by an array val.

NOTE: The node that is the root has it parent set to -1.
i.e. in the parent array the node with parent as -1 is the root.

2 Constraints

1. $1 \leq n \leq 10^5$ - the size of tree

2. Par_i for all $0 \leq i \leq n-1$ where Par_i gives the parent of ith node. $-1 \leq par_i \leq n-1$

3. val_i for all $0 \leq i \leq n-1$ where val_i gives the value of ith node. $val_i \leq 1e9$

3 Input Format

n
Parent array of size n
Value array of size n

4 Output Format

Array of size n. where $output_i$ gives the min in subtree of i.
Example testcase:
5
-1 0 1 2 3
4 2 9 6 5

Output:
2 2 5 5 5