You are given a sequence of integers. Insert the integers one by one into a Binary Search Tree (BST) following standard BST insertion rules. After constructing the BST, output the inorder traversal of the tree.

Input

- The first line contains an integer N — the number of elements.
- The second line contains N space-separated integers representing the order in which elements are inserted into the BST.

Output

Print the inorder traversal of the constructed BST as space-separated integers on a single line.

Constraints

- 1≤N≤105
- −10^9≤Ai≤10^9
- All input integers are distinct.

Example Input

7 50 30 20 40 70 60 80

Output

20 30 40 50 60 70 80

The full code must be implemented in assembly language.