The Lost Temple's Zigzag Challenge

Submit solution

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Points: 100 (partial)
Time limit: 1.0s
Memory limit: 129M

Allowed languages
C

Deep within a forgotten jungle, you discover the ruins of an ancient temple. Its walls are covered in mysterious carvings, and in the heart of the temple stands a colossal stone structure—an enchanted tree known as the **Tree of Secrets**. Legend tells that this tree is no ordinary tree; it is a **Binary Search Tree (BST)** whose nodes hold the keys to a hidden treasure.

According to the ancient lore, the path to the treasure is revealed only when the tree is traversed in a special way—a **zigzag (spiral) traversal** that alternates direction at each level. Only by following this peculiar path can one unlock the temples secrets and claim the treasure that has eluded seekers for centuries.

Your quest is to help the brave explorer decipher the ancient code. Given the preorder traversal of the BST representing the temples structure, you must reconstruct the tree and then output its zigzag traversal.

Given the preorder traversal of a BST, construct the BST and print its zigzag (spiral) level order traversal.

Input Format

- The first line contains a single integer **T**, the number of test cases.
- For each test case:
  - The first line contains an integer **N**, the number of nodes in the BST.
  - The second line contains **N** space-separated integers, representing the preorder traversal of the BST.

Note: The provided preorder traversal is always valid for a BST.

Output Format

For each test case, output a single line containing the zigzag (spiral) traversal of the BST. The values should be separated by a single space.

- **$1 \le T \le 10$**
- **$1 \le N \le 10^6$**
- For 30 points: The sum of all **N** in the input is less than **1,000**.
- For 20 points: The sum of all **N** in the input is less than **2.5×10^6**.
- For 50 points: Also Memory Optimised
- All node values are distinct integers.

Sample Input

Copy

```
2
6
8 5 1 7 10 12
7
15 10 8 12 20 16 25
```

Sample Output

Copy

```
8 10 5 1 7 12
15 20 10 8 12 16 25
```

Clarifications

Request clarification

No clarifications have been made at this time.