



# **Best BST**

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✓ Points: 100 (partial)② Time limit: 1.0s

**■ Memory limit:** 512M

**✓** Allowed languages

## **Problem Statement**

## Story

In the kingdom of Algoria, the wise King Numeron seeks to organize his vast collection of magical artifacts. To ensure efficient retrieval, he decides to arrange them in a special structure called a Binary Search Tree (BST) with the smallest possible height. The royal mathematicians have determined that the number of artifacts he owns is always of the form  $2^k - 1$ , making the arrangement perfectly balanced. As the royal programmer, your task is to help the king build this BST and list the artifacts in pre-order.

#### Task

You are given an integer [n], which is of the form  $[2^k - 1]$  for some integer [k] where  $[1 \le k \le 20]$ . You are also given an array of [n] distinct integers, each ranging from [1] to  $[10^{18}]$ .

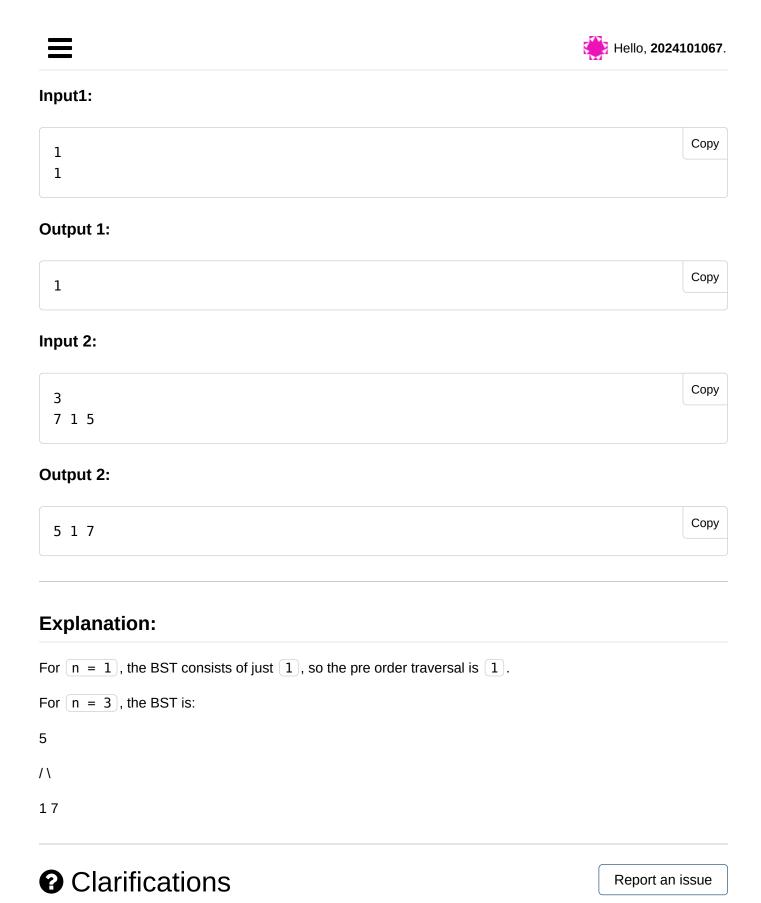
Your task is to construct a Binary Search Tree (BST) with the smallest possible height that contains all the elements. Then, print the pre-order traversal of this BST.

#### **Constraints**

- $n = 2^k 1$ , where  $1 \le k \le 20$ .
- The array contains n distinct integers.
- Each integer in the array is between 1 and 10^{18} (inclusive).
- The output should be the pre-order traversal of the BST.

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No clarifications have been made at this time.

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