Best BST

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Allowed languages
C

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 <= k <= 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 <= k <= 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.

Input1:

```
1
1
```

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Output 1:

```
1
```

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Input 2:

```
3
7 1 5
```

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Output 2:

```
5 1 7
```

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Explanation:

For `n = 1`, the BST consists of just `1`, so the pre order traversal is `1`.

For `n = 3`, the BST is:

5

/ \

1 7

Clarifications

Report an issue

No clarifications have been made at this time.