

**Input format**

Given the number  $N$ ,  $M$  ( $1 \leq N, M \leq 10^5$ ) - the number of branches in the available path in the mountains and the number of paths written on a piece of paper. In the next line  $N$  integers describe the BST. The following  $M$  lines describe the paths  $p_1, p_2, p_3, \dots, p_M$  ( $2 \leq |p_i| \leq 100$ ) written on a piece of paper.

**Output format**

You need to print  $M$  lines where  $i^{th}$  line should be  $YES$  if the path  $p_i$  to the peak is available, otherwise  $NO$ .

Submit a solution

Language: g++ - GCC 13.1 c++17

[illegible]

The screenshot shows a web browser window at the top with various icons in the taskbar. The browser address bar shows "В режим «Для чтения»". The main content area displays the ADS-Lab-04 interface. At the top, there's a navigation bar with links: Info, Summary, Submissions, Standings, Submit clar, Clarx, Settings, and Logout [ADS25\_24R031718]. Below this, a green status bar indicates "21:10:12 / RUNNING". A table with letters A through J is visible. The main section is titled "Submit a solution for C-111632. Christmas Gifts". It lists limits: Time limit: 1 s, Real time limit: 5 s, Memory limit: 256M. The problem description states: "Christmas is coming! Everyone is preparing gifts for their families. The Damir's family is also preparing for this. The Damir's family has many children, so the parents decided to buy n various gifts. Parents decided to number these gifts - y-th as a\_y. They hang them on Christmas tree in socks, following the form binary search tree. In particular, they insert y-th gift with the value a\_y following the rules of binary search tree. As you know, Damir is the smallest among the whole family. Therefore, parents for the holiday allowed him to pick up his gift first. Damir knew that his gift has number k, but he mistakenly assumed that all the gifts below his gift were also intended for him. Now, parents are confused and want to find out what gifts Damir wants to grab for himself." The input format specifies three lines: n, a sequence of integers a\_i, and k. The output format requires a subtree in pre-order. Examples show an input of 3, [4, 2, 7], and 2, resulting in an output of [2, 1, 3]. Notes include a diagram of a binary search tree where node 4 is the root, with left child 2 and right child 7. Node 2 has left child 1 and right child 3. The value to search for is 2, and the expected subtree output is [2, 1, 3]. At the bottom, there's a "Submit a solution" button and a language selector set to "g++ - GCC 13.1 c++17".

Небезопасно — ejudge.kz

Submit a solution for D-105816. Aureole

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem D: 105816. Aureole

You are given a permutation of size  $n$ . Create an empty BST, and insert into BST values  $p_1, p_2, \dots, p_n$  in this order. You need to find how many levels are there and sum the of values for each level.

Input format

In the first line there is a single integer  $1 \leq n \leq 5000$  size of permutation. Second line contains  $n$  distinct numbers from 1 to  $n$  - the permutation.

Output format

In first line output  $k$  - maximum level in bst. In second line output  $k$  integers - sum of values for each level.

Examples

Input

1  
1

Output

1  
1

Input

5  
4 3 5 1 2

Output

4  
4 8 1 2

Notes

Level of vertex is defined as:  
Level of root is 0, and level of each non-root vertex is (level of it's parent) + 1.  
In second testcase, BST looks like this:

```
graph TD; 4((4)) --> 3((3)); 4 --> 5((5)); 3 --> 1((1)); 1 --> 2((2));
```

There are 4 levels, and sum for each level is 4, 3 + 5, 1, 2.

Submit a solution for E-52477. Width

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem E: 52477. Width

Given a binary tree, write a program to get the width of the given tree.  
The level of a node is the number of vertices on the path from this node to the root. The width of a level  $h$  is the number of vertices with level  $h$ . The width of a tree is the maximal width over the levels.  
Vertex number 1 always will be root.

Input format

Given integer  $n = (1 \leq n \leq 10^3)$ , number of vertices. The next  $n - 1$  lines has 3 numbers  $x, y, z$  - description of binary tree, meaning that vertex  $y$  son of vertex  $x$ , if  $z = 0$ , it is left son, if  $z = 1$  it is right son.

Output format

Print one integer maximum width.

Examples

Input

6  
1 2 1  
1 3 0  
3 5 0  
3 4 1  
2 4 1

Output

3

Input

4  
1 2 0  
2 3 0  
2 4 1

Output

2

Notes

sample 1:

Explanation: The maximum width existing in the third level with the length 3 (5,6,4).

sample 2:

Explanation: The maximum width existing in the third level with the length 2 (3,4).

Submit a solution

Language: 

g++ - GCC 13.1 c++17

Доступен перевод

ADS-Lab-...



В режим «Для чтения»

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Соренсен Даниел Тайтунуни [ADS-Lab-04]: Submit a solution

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21:10:32 / RUNNING

A	B	C	D	E	F	G	H	I	J
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### Submit a solution for G-197831. Killua and Hunter exam

**Time limit:** 1 s  
**Real time limit:** 5 s  
**Memory limit:** 256K

**Problem G: 197831. Killua and Hunter exam**

While Gon is surviving on the Greed Island, Killua, after the first unsuccessful attempt to pass the hunter exam, decides to test himself again. This time one of his tasks is to find the maximum distance between any two vertices in a binary search tree. Since Killua is pretty bad at algorithms, he asks for your help.

**Input format**

In the first line you will be given single number  $N$  ( $1 \leq N \leq 200000$ ). Next line consists of  $N$  numbers, where  $a_i$  ( $1 \leq a_i \leq 10^9$ ) represents the  $i$ -th number inserted to a binary search tree. If  $a_i$  was found in a tree, then you don't have to insert it again.

**Subtasks**

- (30%)  $N \leq 100$ .
- (30%)  $N \leq 1000$ .
- (40%) No additional constraints.

**Output format**

Print one single number - the maximum distance between any two vertices in a binary tree.

**Examples**

**Input**

```
9
11 5 3 2 1 7 9 8 13
```

**Output**

```
7
```

**Input**

```
5
1 2 4 3 5
```

**Output**

```
4
```

**Input**

```
7
4 2 6 5 1 3 7
```

**Output**

```
5
```

**Notes**

In the first test, the answer is the distance between nodes 1 and 8.

**Submit a solution**

Language:

Доступен перевод

23:10:36 / RUNNING

A B C D E F G H I J

Submit a solution for H-111743. Greater Sum Tree

Time limit: 1 s  
Real time limit: 5 s  
Memory limit: 256M

Problem H-111743. Greater Sum Tree

Given the root of a **binary search tree** with distinct keys. Replace the key of each node with the sum of the keys over the nodes that has greater than or equal key. Print new keys in increasing order.  
As a reminder, a **binary search tree** is a tree that satisfies these constraints:  
• The left subtree of a node contains only nodes with keys less than the node's key.  
• The right subtree of a node contains only nodes with keys greater than the node's key.  
• Both the left and right subtrees must also be binary search trees.

Input format

The number of nodes  $n$  in the tree is between 1 and 100. Each node will have value between 0 and 1000. The given tree is a binary search tree.

Output format

In a single line print the answer.

Examples

Input  
3  
4 1 6 0 2 3 5 7 8

Output  
8 15 21 26 30 33 35 36 38

Notes

```
graph TD; 4((4 30)) --> 1((1 36)); 4 --> 6((6 21)); 1 --> 0((0 36)); 1 --> 2((2 35)); 2 --> 3((3 33)); 6 --> 5((5 26)); 6 --> 7((7 15)); 7 --> 8((8 8));
```

NOTE: Solve with BST!

Submit a solution

Language: g++ - GCC 13.1 c++17



21:10:41 / RUNNING

A B C D E F G H I J

Submit a solution for I-105712. BST with multiplicities

Time limit: 1 s

Real time limit: 5 s

Memory limit: 256M

Problem I: 105712. BST with multiplicities

You are given implementation of Binary Search Tree. You need to introduce new feature to the Binary Search Tree. It must be able to contain not only nodes with unique keys, but the number of copies of that key as well.

You are given several queries, each of them is of one the type:

'insert X' - insert X into the tree, if it already in a tree - increase its multiplicity,

'delete X' - decrease multiplicity of X by one, if it became zero - delete the node from the tree,

'cnt X' - output the multiplicity of X.

To complete the task you need to download solution code from <https://bit.ly/3kWuJJa> and make some extra changes in it. Remaining code was written for you.

Input format

The first line contains single integer  $Q$  - number of queries ( $1 \leq Q \leq 10^5$ ). Each of the next  $Q$  lines contains one query.

Output format

Print answer on each query of type 'cnt X' in separate line.

Examples

Input

4  
insert 1  
cnt 1  
insert 1  
cnt 1

Output

1  
2

Input

8  
insert 1  
cnt 1  
insert 1  
cnt 1  
delete 1  
cnt 1  
delete 1  
cnt 1

Output

1  
2  
1  
0

Submit a solution

Language: 

g++ - GOC 13.1 c++17

Доступен перевод

21:10:45 / RUNNING

A B C D E F G H I J

Submit a solution for J-106664. Balanced Binary Search Tree

Time limit: 1 s  
Real time limit: 5 s  
Memory limit: 256M

Problem J. 106664. Balanced Binary Search Tree

You have an array with  $2^N - 1$  elements in it. You want to build the Binary Search Tree on this array, adding elements in order of their appearance in array (from left to right). But there is a probability that the tree would be imbalanced. That's why you decided to shuffle your array to obtain **perfectly balanced** Binary Search Tree (i.e. BST with perfect binary tree underneath) after adding elements (from left to right, again). Your task is to print your array after appropriate shuffle. If there are several possible shuffles, print the array after applying any of them.

Note, that you are not asked for building Binary Search Tree, but only for shuffling array.

Input format

The first line of input consists of single integer  $N$  that describes the length of the array ( $1 \leq N \leq 15$ ).

The next line contains  $2^N - 1$  integers  $a_i$  - elements of the array ( $0 \leq a_i \leq 2 \cdot 10^9$ ).

It is guaranteed that there are no duplicates in the array.

Output format

Print  $2^N - 1$  integers - elements in your array after applying required shuffle.

Examples

Input

2  
3 5 1

Output

3 5 1

Input

2  
1 3 5

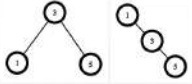
Output

3 1 5

Notes

In the first sample given array can be used for building balanced BST (left picture).

In the second sample given array gives such chain tree (right picture), so it must be shuffled.



Note, that for both samples [3, 5, 1] and [3, 1, 5] are correct answers.

Hint: Use divide and conquer method (recall advanced sorting algorithms) and implement recursive function to solve this problem.

Submit a solution

Language: 

g++ - GCC 10.1 c++17

