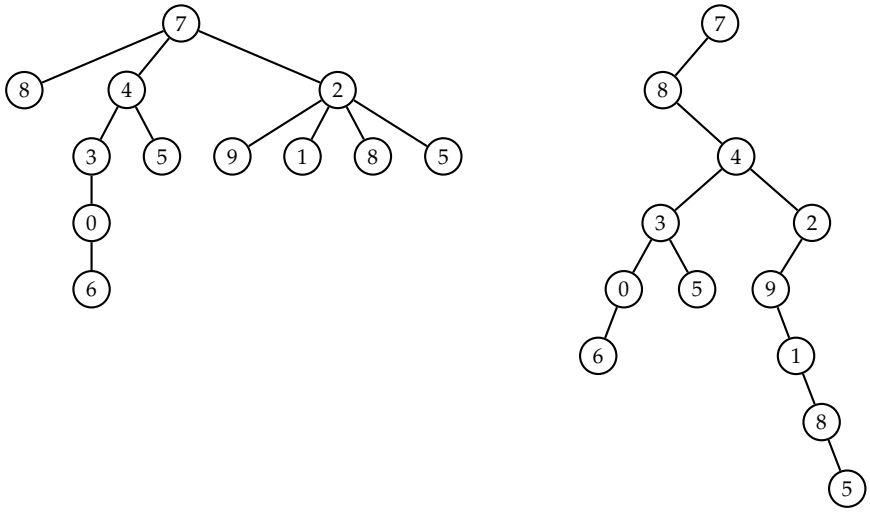
Left child, right sibling (1) P32655_en

Left child, right sibling is the name of a known bijection between the general trees and the non empty binary trees with empty right subtree. To convert a general tree to binary tree the first child (starting on the left) is made its leftmost child of each node and the remaining nodes one after another are made the right child of the previous sibling.

For instance, the general tree on the left corresponds to the binary tree on the right:



Write a program that reads the shape of various general trees, and for each one prints the height of the corresponding binary tree.

Input

Input starts with m, the number of trees that must be treated The description of the m trees follow as is explained at the exercise : "", with two exceptions: The values are not given, because the content of the nodes here is not important. The number of nodes is neither given, because you do not need to store the trees in any vector to solve this exercise.

Output

Your program must print the height corresponding to the binary tree of each given tree.

Sample input

```
3

3 2 0 1 1 0 0 4 0 0 0 0
2 1 0 0
2 0 0
```

Sample output

```
8
3
3
```

Problem information

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