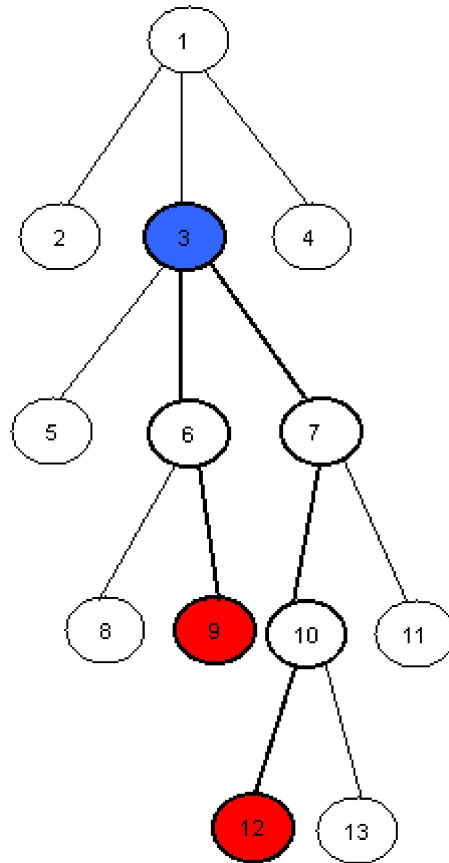


# LCA - Lowest Common Ancestor

A tree is an undirected graph in which any two vertices are connected by exactly one simple path. In other words, any connected graph without cycles is a tree. - Wikipedia

The lowest common ancestor (LCA) is a concept in graph theory and computer science. Let  $T$  be a rooted tree with  $N$  nodes. The lowest common ancestor is defined between two nodes  $v$  and  $w$  as the lowest node in  $T$  that has both  $v$  and  $w$  as descendants (where we allow a node to be a descendant of itself). - Wikipedia

Your task in this problem is to find the LCA of any two given nodes  $v$  and  $w$  in a given tree  $T$ .



**For example the LCA of nodes 9 and 12 in this tree is the node number 3.**

## Input

The first line of input will be the number of test cases. Each test case will start with a number  $N$  the number of nodes in the tree,  $1 \leq N \leq 1,000$ . Nodes are numbered from 1 to  $N$ . The next  $N$  lines each one will start with a number  $M$  the number of child nodes of the  $N$ th node,  $0 \leq M \leq 999$  followed by  $M$  numbers the child nodes of the  $N$ th node. The next line will be a number  $Q$  the number of queries you have to answer for the given tree  $T$ ,  $1 \leq Q \leq 1000$ . The next  $Q$  lines each one will have two number  $v$  and  $w$  in which you have to find the LCA of  $v$  and  $w$  in  $T$ ,  $1 \leq v, w \leq 1,000$ .

Input will guarantee that there is only one root and no cycles.

## Output

For each test case print  $Q + 1$  lines, The first line will have "Case C:" without quotes where  $C$  is the case number starting with 1. The next  $Q$  lines should be the LCA of the given  $v$  and  $w$  respectively.

## Example

**Input:**

```
1
7
3 2 3 4
0
3 5 6 7
0
0
0
2
5 7
2 7
```

**Output:**

```
Case 1:
3
1
```