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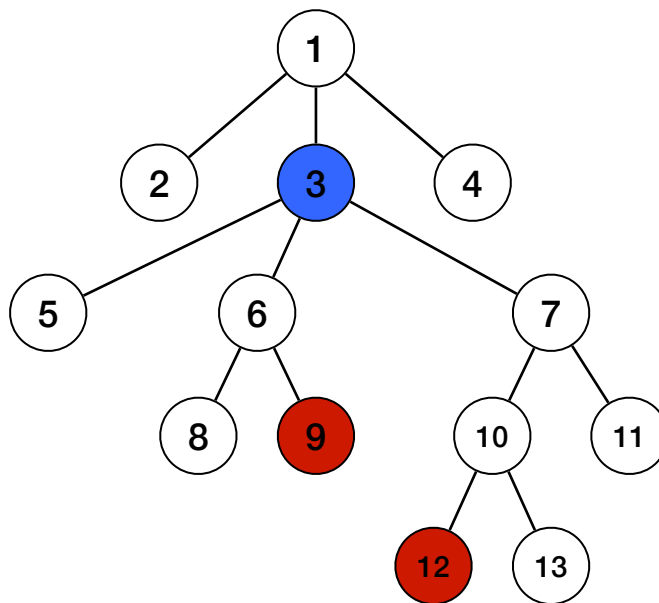
For example the LCA of nodes 9 and 12 in this tree is the node number 3.

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 Nth node, $0 \leq M \leq 999$ followed by M numbers the child nodes of the Nth 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	Output
1 7 3 2 3 4 0 3 5 6 7 0 0 0 0 2 5 7 2 7	Case 1: 3 1