# Problem A – Problem A

In the faraway kingdom of Arboria, the Great Sage has discovered a magical rooted tree with an interesting property: it holds secrets about the paths connecting its inhabitants. The tree is home to $N$ unique species, each living on a different node of the tree. The Sage has a fascination for measuring the distances between species in their own territories, especially within their own subtrees.

The rooted tree is structured such that each node (or territory) has a direct connection to another, forming a large, interconnected kingdom with $N-1$ roads with the root being node 1. The Great Sage has selected you, the brightest scholar in the land, to help him answer several queries about the distances between species in different parts of the tree.

For each query, you are given a node $U$ (representing the root of a subtree) and a distance $K$. The Sage wants to know how many species in the subtree rooted at $U$ can be found within a distance of at most $K$ from $U$.

Can you help the Sage answer these queries efficiently?

## Input

The first line contains an integer $N$ ($1 \leq N \leq 10^5$), the number of nodes in the tree.

The next $N-1$ lines each contain two integers $A$ and $B$ ($1 \leq A, B \leq N$), representing an edge between node $A$ and node $B$.

The next line contains an integer $Q$ ($1 \leq Q \leq 10^5$), the number of queries.

Each of the following $Q$ lines contains two integers $U$ and $K$ ($1 \leq U \leq N$, $0 \leq K \leq N-1$), representing a query asking how many nodes in the subtree rooted at $U$ are at a distance of at most $K$ from $U$.

## Output

For each query, print a single integer separated with a space, the number of nodes in the subtree rooted at $U$ that are at a distance of at most $K$ from $U$.

| Sample input 1 | Sample output 1 |
|---|---|
| 10 | 3 10 4 5 8 |
| 1 2 | |
| 1 3 | |
| 2 4 | |
| 2 5 | |
| 2 6 | |
| 4 7 | |
| 7 8 | |
| 7 9 | |
| 7 10 | |
| 5 | |
| 1 1 | |
| 1 4 | |
| 2 1 | |
| 2 2 | |
| 2 3 | |

| Sample input 2 | Sample output 2 |
|---|---|
| <pre>5<br>1 2<br>1 3<br>1 4<br>1 5<br>4<br>1 0<br>1 1<br>2 0<br>2 4</pre> | <pre>1 5 1 1</pre> |