

## DISQUERY – Distance Query

graph theory, trees

<https://www.spoj.com/problems/DISQUERY>

The traffic network in a country consists of  $N$  cities (labeled with integers from 1 to  $N$ ) and  $N - 1$  roads connecting the cities. There is a unique path between each pair of different cities, and we know the exact length of each road.

Write a program that will, for each of the  $K$  given pairs of cities, find the length of the shortest and the length of the longest road on the path between the two cities.

### Input:

The first line of input contains an integer  $N$ ,  $2 \leq N \leq 100\,000$ . Each of the following  $N - 1$  lines contains three integers  $A$ ,  $B$  and  $C$  meaning that there is a road of length  $C$  between city  $A$  and city  $B$ .

The length of each road will be a positive integer less than or equal to  $1\,000\,000$ .

The next line contains an integer  $K$ ,  $1 \leq K \leq 100\,000$ . Each of the following  $K$  lines contains two different integers  $D$  and  $E$  – the labels of the two cities constituting one query.

### Output:

Each of the  $K$  lines of output should contain two integers – the lengths from the task description for the corresponding pair of the cities.

### Examples:

Input	Output
5	100 200
2 3 100	50 150
4 3 200	50 100
1 5 150	
1 3 50	
3	
2 4	
3 5	
1 2	
7	2 6
3 6 4	1 4
1 7 1	6 6
1 3 2	2 2
1 2 6	2 6
2 5 4	
2 4 4	
5	
6 4	
7 6	
1 2	
1 3	
3 5	