Problem C - Apple Distances

Daniel needs to check on some trees in his orchard. Daniel needs to do some computations to figure out the most efficient way to do so.

As before, each tree is labeled with a number between 0 and $n-1$. There are gravel roads between the trees and each tree has a unique path to tree 0 in front of Daniel's house.

Determine for each pair of trees the distance Daniel would have to walk to get from one tree to the other.

Input

The first line contains a single integer, T specifying the number of test cases.

Each test case begins with one integer n ($1 \leq n \leq 2 \times 10^5$) denoting the number of trees in Daniel's orchard. Then on the ith ($1 \leq i \leq n-1$) line of the test case contains two space seperated integers a ($0 \leq b < n$) and d ($1 \leq d \leq 10^9$) denoting that the labeled trees a and i are connected by a road of length d.

The next line contains q ($1 \leq q \leq 2 \times 10^5$) the number of queries. Then follows q lines with a pair of integers x, y ($0 \leq x, y < n$) the labels of the two trees Daniel is interested in.

Output

For each test case, output the length of the path between x and y for each query on a single line seperated by a space.

Sample Input

```
3
6
0 8
1 7
1 9
0 3
4 2
4
2 3
5 2
1 4
0 3
2
0 1
2
1 0
0 1
6
0 1000000000
1 1000000000
2 1000000000
3 1000000000
4 1000000000
1
5 0
```

Sample Output

```
16 20 11 17
1 1
5000000000
```