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 data

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 data

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

```
5
2 3 100
4 3 200
1 5 150
1 3 50
3
2 4
3 5
1 2
```

output

```
100 200
50 150
50 100
```

input

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

output

```
2 6
1 4
6 6
2 2
2 6
```

input

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

output

```
1 2
2 4
1 5
2 2
1 4
```