Another Contest 2 Problem 3 - Poutine

Time limit: 0.6s **Memory limit:** 256M
Java 8: 1.0s
PyPy 3: 2.0s

Fast Fingers Thomas is delivering poutine to Wilson's restaurants!

Fast Fingers Thomas will drive a truck on a weighted tree with N vertices.

Each trip has two parameters, a source vertex s_i and a destination vertex t_i. Thomas does not like driving along long edges, so he seeks to minimize the length of the second-longest edge that he travels on. Formally, if the weights of the edges that Thomas traverses are $W_1, \ldots, W_K$ in nondecreasing order, he seeks to minimize W_{K-1}.

For each trip, compute this quantity.

Constraints

$2 \leq N \leq 10^5$

$1 \leq a_i, b_i \leq N$

$1 \leq w_i \leq 10^9$

$1 \leq Q \leq 10^5$

$1 \leq s_i, t_i \leq N$

$s_i \neq t_i$

Input Specification

The first line contains a single positive integer, N.

The next $N-1$ lines contain three space-separated integers, a_i, b_i, and w_i, indicating an undirected edge between a_i and b_i of weight w_i.

The next line contains a single positive integer, Q.

The next Q lines contain two space-separated positive integers, s_i and t_i, the parameters for query i.

Output Specification

Output Q lines. On the ith line, output the length of the second-longest edge that Thomas will take for the ith trip. If Thomas can travel between s_i and t_i using strictly fewer than two edges, output `-1`.

Sample Input

```
4
1 2 2
2 3 3
3 4 4
2
1 3
2 4
```

Sample Output

```
2
3
```