

7562 Coins

Our *Farzi Coder* likes *Mota Chuha* a lot, as he runs very fast catching him is not only hard but also impossible.

The city is in the form of a tree (Graph Theory Tree), with N junctions each having exactly one follower of *Farzi Coder*. There are $N - 1$ bidirectional roads connecting these junctions such that there is exactly one distinct path between any pair of junctions.

Now *Farzi Coder* decides to distribute some of his illegal wealth among his followers so as to maintain their loyalty and wants *Mota Chuha* to do this task for him. During the process of distribution, *Farzi Coder* would also ask *Mota Chuha* some questions, to check if he is really distributing the coins correctly.

Now for the next Q days, on each day, he assigns exactly one of the following two tasks to *Mota Chuha*:

1. $Give(X, Y, W) \implies$ Give one W rupee coin to all followers along the path in the tree between the followers X and Y (including X and Y).
2. $Find(Z, I, J, K) \implies$ Find the K -th smallest coin among all the coins present in the hands of follower X which were distributed between I -th and J -th day (including I -th and J -th days). If X has less than K coins, then report '-1'. It is guaranteed that J will be less than the current day number.

Mota Chuha is too lazy to distribute the wealth. But he has to answer the $Find(X, K)$ tasks. He knows that ICPC participants are very smart and can simulate the $Update()$ tasks through a program and can answer the $Find()$ tasks very fast. So please help him, he might give some of the coins to you.

Note that a person can hold multiple coins of same value. Let us say, person Z has P coins with him which were distributed between I -th and J -th days, i.e, $Coin[1], Coin[2], \dots, Coin[P]$. Sort the array $Coin[1 \dots P]$. Now, K -th smallest coin is $Coin[K]$.

Example: If person Z has coins $\{1, 2, 3, 3, 4\}$, then 2nd smallest coin is 2, 3rd smallest coin is 3, 4th smallest coin is 3, 5th smallest coin is 4.

Input

The input file contains several test cases, each of them as described below.

The first line contains one integer N , size of the tree.

Next $N - 1$ lines contain two space separated integers ' $X Y$ ' (without quotes), each representing an edge between the nodes X and Y .

Next line contains an integer Q .

Next Q lines contain the tasks given to *Mota Chuha*. If the first integer in the line is 1, then it is followed by three space separated integers ' $X Y W$ ' (without quotes) denoting the first type of task. Else if the first integer in the line is 2, then it is followed by 4 space separated integers ' $Z I J K$ ' (without quotes) denoting the second type of task.

Output

For each test case, and for each task of type 2, output the required answer, on a line by itself.

Constraints:

- $1 \leq N \leq 500000$

- $1 \leq X, Y, Z \leq N$
- $1 \leq I \leq J < \text{Current Day Number}$
- $1 \leq W \leq 100000$
- $1 \leq Q \leq 100000$
- $1 \leq K \leq J - I + 1$

Sample Input

```
2
1 2
4
1 1 2 121
1 1 2 256
2 1 1 1 1
2 1 2 2 1
```

Sample Output

```
121
256
```