Vinish and Asgard Queries

Problem Code: **NPLQ18B**

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Vinish is the new king of Asgard.

Asgard is a connected kingdom of N cities with each pair of cities having exactly one path between them.Let the traffic present in each city i be TF[i].The cost of a path between two cities is determined by the sum of traffics of the individual cities present along the path.

Vamsi wanted to test Vinish by asking him a few questions about Asgard. There are two types of questions:
Type 1: Given cities u and v,find the minimum cost path between u and v.
Type 2: Given u and x,update the traffic of city u to x.

Vinish,being the new king of Asgard was busy with his work.Help Vinish find the answers!

Input

First line consists of number of test cases T.For each test case input is as given below.

First line of each test case is N,the number of cities in Asgard.
Each of the next N-1 lines contains 2 space separated cities representing a path between them.
After that,the following line contains N space separated integers representing the traffic present in each city,(TF_1, TF_2, ..., TF_N)

The next line contains Q,the number of queries
Each query consists of three integers type,u,v or x.

Output

For each test case,print the answers to queries of type 1.

Constraints

- $1 \leq T \leq 10$
- $1 \leq N \leq 10^5$
- $1 \leq TF_i \leq 10^9$
- $1 \leq Q \leq 10^5$
- $1 \leq u,v \leq N$
- $1 \leq x \leq 10^9$
- $1 \leq type \leq 2$

Example

```
Input:
1
5
1 2
1 3
3 4
3 5
1 1 1 1 1
5
1 2 5
2 4 5
1 1 4
2 3 6
1 4 5


Output:
4
7
12
```

Explanation

For 1st Test case : Cities in the minimum cost path from 2 to 5 are {2,1,3,5} each having traffic value as 1,so cost is 4.Similarly for 3rd query the cities in the path from 1 to 4 are {1,3,4} having traffic values 1,1,5 incurring a cost of 7.

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Date Added:	13-09-2018
Time Limit:	2 secs
Source Limit:	50000 Bytes
Languages:	C, CPP14, JAVA, PYTH, PYTH 3.6, PYPY, CS2, PAS fpc, PAS gpc, RUBY, PHP, GO, NODEJS, HASK, rust, SCALA, swift, D,