

After the War

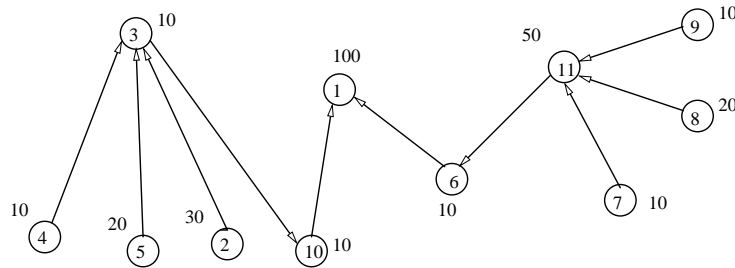
Lets dive into the future! Aliens attacked the world and we defeated them. But the consequence of the war was disastrous; all the road networks was destroyed by the aliens. UNO constructed a spanning tree among the countries. As the next step, UNO wants to select some countries to build hospitals in those countries. The policy is as follows.

“Select some nonadjacent countries in such a way that the sum of the populations of those selected countries is the maximum”

You are assigned for the selection task, since you are the only programmer alive after the war.

As shown in the figure, the countries are denoted by some circles. The name of the countries are encircled and each circle has a label which is the number of population in that country. The central office of UNO is always placed in the country entitled 1. The arrows are directed toward the central office of UNO.

You cannot select both 2 and 3, since those two countries are adjacent. You may select 4,5,2,10,7,8,9,6; where the sum of the populations is 120. But if you select 4,5,2,1,11 then the sum of the populations is 210 which is the maximum.



Input

The integer of the first line of the input is the number of countries n , where $1 \leq n \leq 200$. Each of the next n lines of the input is a pair contains two integers. The first integer is the name of the country, and the second integer is the population p of that country; $1 \leq p \leq 10^5$. Each of the next $n - 1$ lines of the input is a pair contains two integers. The first integer is the name of a country c , and the second integer is the name of the next country along the path from c to the UNO. The input is terminated by 0.

Output

For each of the cases in the input, print one line containing a number, the sum of the populations of the selected countries where the sum is maximized.

Sample Input

11
1 100
10 10
2 30
9 10
3 55
8 20
4 10
7 10
5 20
6 10
11 50
4 3
5 3
2 3
3 10
7 11
8 11
9 11
11 6
6 1
10 1

6
1 1
2 1
3 1
4 1
5 1
6 1
2 1
3 1
4 1
5 2
6 2

0

Sample Output

210

4

Remarks

There will be around 50 test cases. You must use dynamic programming technique to solve the problem.