Weighted tree domination

Time limit: 2 seconds

Problem Description

Given a tree with nonnegative weights on nodes, find a minimum total weight domination set. A node subset D is a domination set if each node not in D is adjacent to at least one node in D.

Technical Specifications

1. There are n ($1 \leq n \leq 1000$) nodes, and each of them has a unique ID from 1 to n. The ID of the root is 1.

2. For each $i = 1,2,\ldots,n$, the weight r_i of the node with ID i is a positive integer no more than 1000.

Input Format

The first line of the input file contains an integer indicating the number of test cases to follow. Test cases are separated by a single blank line.

For each test case, the first line of input contains two integers n and r_1. For each $i = 2, \ldots, n$, the i-th line of input contains two integers s_i and r_i, where s_i is the ID of the parent of node i.

Output Format

For each test case, output the minimum total weight of any domination set of the tree.

Sample Input

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

15 1
1 5
1 3
1 10
2 14
2 4
3 8
4 3
5 2
5 11
6 2
6 6
8 9
8 6
8 7
```

Sample Output

```
11
23
```