

Company Board

Filename: *board*

Time Limit: *1 second*

A company has a traditional hierarchy structure where each employee, except the CEO, has one direct supervisor and some of the employees have a subset of employees who they directly supervise. This hierarchy creates a tree structure, with the CEO as the root of the tree.

Each employee has some number of connections with non-profit organizations. The company would like to choose a subset of its employees to form a board that arranges volunteering opportunities for its employees. Since this is the nature of the board, the goal is to maximize the sum of the number of connections that the board members have with non-profit organizations.

Unfortunately, it's awkward with the board contains two employees where one is a direct or indirect supervisor of another one, since the employee below the chain between the two might not want to offend his superior up the chain. Given this restriction, write a computer program that determines the maximum sum of number of connections with non-profit organizations that any board could have. (The restriction means that if employee A is on the board, then no employee below him in his subtree can also be on the board.)

The Problem

Given a company structure and the number of connections each employee has with non-profit organizations, calculate the maximum sum of number of connections with non-profit organizations that the board could have without having a pair of employees where one is either the direct or indirect supervisor of the other.

The Input

The first line of input will consist of a single positive integer, c ($c \leq 25$), representing the number of input cases to process. The first line of each input case will contain a single positive integer, n ($2 \leq n \leq 100$), representing the number of employees in the company for the case. The employees are numbered 0 through $n-1$, with employee 0 being the CEO. The next n lines of each input case will contain information about each employee. In particular, on line i , ($0 \leq i \leq n-1$), there will be two space separated integers, s_i ($-1 \leq s_i \leq n-1$) and c_i ($0 \leq c_i \leq 10^6$), representing the supervisor of employee i (note that we denote the CEO's supervisor as -1 to indicate she has no supervisor) and the number of connections employee i has, respectively.

Partial Credit Input (60%)

The number of employees, n , will be bounded by $2 \leq n \leq 10$. Also, the supervisor of employee i , s_i , will be bounded by $-1 \leq s_i \leq i-1$. All other bounds are the same.

The Output

For each input case, output the maximum sum of number of connections with non-profit organizations that the board could have without having a pair of employees where one is either the direct or indirect supervisor of the other, on a line by itself.

Sample Input

```
2
10
-1 50
0 20
1 10
1 30
3 15
3 14
0 16
6 8
6 2
6 7
5
-1 100
0 15
0 18
0 22
0 27
```

Sample Output

```
57
100
```