6ᵗʰ South African Regional
ACM Collegiate Programming Competition

Sponsored by IBM

Problem A – Red balloon
Supercluster

You have recently been employed by Scoogle, a company seeking to build the largest distributed computing cluster ever. Scoogle has managed to connect several thousand computers into a heterogeneous network.

Although their mixed network architecture saved them a lot of money, it has the unfortunate side effect that no two nodes have the same communications delay between them. This has some particularly severe performance implications for the centralised application that they are currently developing. (Scoogle expressly denies all allegations regarding DMCA violations)

Thus you have landed the job of reducing the communications delay between the respective nodes in the cluster. The primary objective is to devise a routing scheme so that all the nodes can send messages to a master node in the shortest possible time. Since the network infrastructure is symmetric, using these routes in reverse also results in a minimum delay from the master node to any other node.

You have decided that a *sink tree* is the best way to solve the problem. This means that you have to construct a tree rooted at a designated master node which minimises the communications delay to each of the other nodes in the cluster.

To further complicate the task, you have to decide which node would be the most suitable choice for the master node. Having chosen the optimal master node, you can determine the cumulative communications delay of the entire network by summing all the delays, i.e. the edges of the sink tree.

Input

As input, you will receive a graph listing all the known point-to-point communications delays between the nodes. The input graph will be presented in row-order.

Each input record will start with an integer value, *n*, specifying the number of nodes in the network. This value will be followed by *n* row entries.

Each row entry starts with the *row_number*, followed by *row_size*, followed by *row_size* pairs of (*node_number*, *delay_value*) entries.

Please note that Scoogle has a very large, dense network, with up to 1000 different nodes.

Output

Your output must be the minimum cumulative communications delay. The cumulative communications delay is computed by summing the point-to-point delays of all the edges in the sink tree. The minimum cumulative communications delay represents the delay achieved by choosing the optimal node as master node.

Sample Input

```
5
  0   4 0 0 1 7548 2 3072 3 11273
  1   3 1 0 2 5703 4 2915
  2   3 2 0 3 9443 4 7458
  3   2 3 0 4 3164
  4   1 4 0
```

Sample Output

```
22245
```