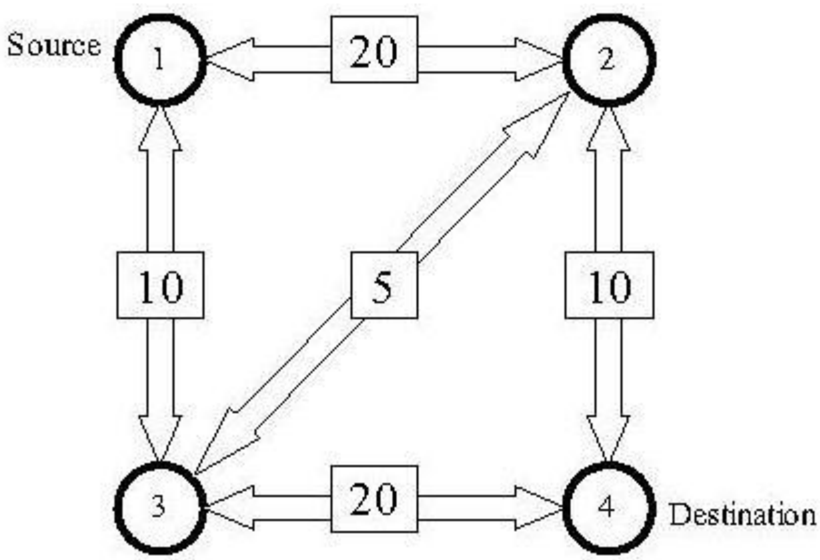
# Uva 820 Internet Bandwidth

On the Internet, machines (nodes) are richly interconnected, and many paths may exist between a given pair of nodes. The total message-carrying capacity (bandwidth) between two given nodes is the maximal amount of data per unit time that can be transmitted from one node to the other. Using a technique called packet switching, this data can be transmitted along several paths at the same time.

For example, the following figure shows a network with four nodes (shown as circles), with a total of five connections among them. Every connection is labeled with a bandwidth that represents its data-carrying capacity per unit time.




In our example, the bandwidth between node 1 and node 4 is 25, which might be thought of as the sum of the bandwidths 10 along the path 1-2-4, 10 along the path 1-3-4, and 5 along the path 1-2-3-4. No other combination of paths between nodes 1 and 4 provides a larger bandwidth.

You must write a program that computes the bandwidth between two given nodes in a network, given the individual bandwidths of all the connections in the network. In this problem, assume that the bandwidth of a connection is always the same in both directions (which is not necessarily true in the real world).

## Input

The input file contains descriptions of several networks. Every description starts with a line containing a single integer n (2 ≤n ≤100), which is the number of nodes in the network. The nodes are numbered from 1 to n. The next line contains three numbers s, t, and c. The numbers s and t are the source and destination nodes, and the number c is the total number of connections in the network. Following this are c lines describing the connections. Each of these lines contains three integers: the first two are the numbers of the connected nodes, and the third number is the bandwidth of the connection. The bandwidth is a non-negative number not greater than 1000.

There might be more than one connection between a pair of nodes, but a node cannot be connected to itself. All connections are bi-directional, i.e. data can be transmitted in both directions along a connection, but the sum of the amount of data transmitted in both directions must be less than the bandwidth.

A line containing the number 0 follows the last network description, and terminates the input.

## Output

For each network description, first print the number of the network. Then print the total bandwidth between the source node s and the destination node t, following the format of the sample output. Print a blank line after each test case.

| **Sample Input** | **Output for the Sample Input** |
|---|---|
| 4<br>1 4 5<br>1 2 20<br>1 3 10<br>2 3 5<br>2 4 10<br>3 4 20<br>0 | Network 1<br>The bandwidth is 25. |

# POJ 1274 The Perfect Stall

Time Limit:1000MS    Memory Limit:10000K

Total Submissions:15760  Accepted:7199

## Description

Farmer John completed his new barn just last week, complete with all the latest milking technology. Unfortunately, due to engineering problems, all the stalls in the new barn are different. For the first week, Farmer John randomly assigned cows to stalls, but it quickly became clear that any given cow was only willing to produce milk in certain stalls. For the last week, Farmer John has been collecting data on which cows are willing to produce milk in which stalls. A stall may be only assigned to one cow, and, of course, a cow may be only assigned to one stall.

Given the preferences of the cows, compute the maximum number of milk-producing assignments of cows to stalls that is possible.

## Input

The input includes several cases. For each case, the first line contains two integers, N (0 <= N <= 200) and M (0 <= M <= 200). N is the number of cows that Farmer John has and M is the number of stalls in the new barn. Each of the following N lines corresponds to a single cow. The first integer (Si) on the line is the number of stalls that the cow is willing to produce milk in (0 <= Si <= M). The subsequent Si integers on that line are the stalls in which that cow is willing to produce milk. The stall numbers will be integers in the range (1..M), and no stall will be listed twice for a given cow.

## Output

For each case, output a single line with a single integer, the maximum number of milk-producing stall assignments that can be made.

## Sample Input

```
5 5
2 2 5
3 2 3 4
2 1 5
3 1 2 5
1 2
```

## Sample Output

```
4
```