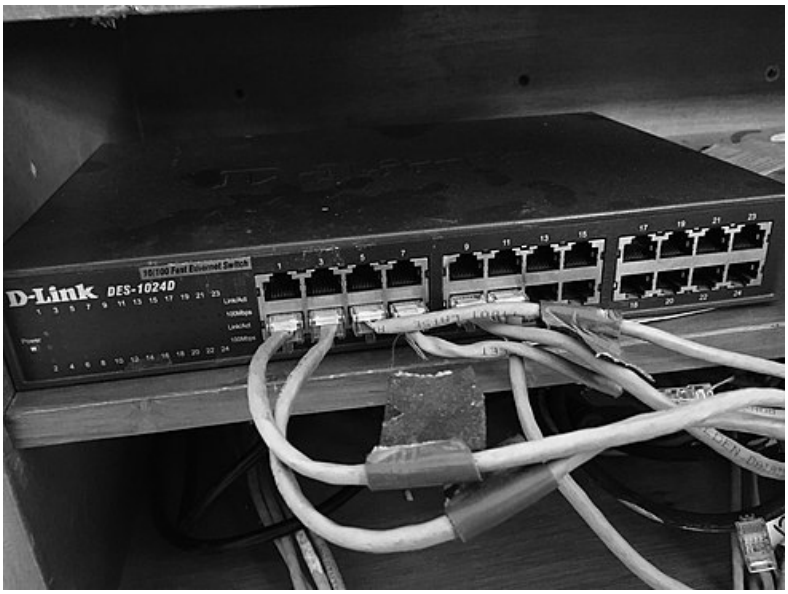
Router Attack

A computer hacker wants to cut all the route of communication between two computers. Messages between these computers are exchanged using a series of routers with connections between them. The hacker can either shutdown a router or disable the connection between adjacent machines (i.e. two computers/routers that can communicate directly between them) in the network. However, disabling each router or connection requires some hours of work.



Your task is to determine the minimum amount of hours the hacker needs to cut all communications between the two computers.

Input Format

The input contains multiple test cases.

Each test cases begins with two integers *R* and *C* denoting the number of router and connections in the network. Then follow *M-2* lines describing each router. The description of a router has three integers, representing, in order, the identifier of the router and the number of hours *h* needed to disable it. The computers have ID's 1 and *R* + 2. A test case ends with *C* lines containing the information of each connection: two integers corresponding to the connected machines and the number of hours *h* needed to disable the network.

Input ends with a single line containing two zeroes.

Constraints

- 0 <= R <= 50
- 0 <= C <= 1000
- 0 <= h <= 100000

Output Format

For each test case, print a single line with the minimum number of hours *m* to disable the network in the format "m hours".

Sample Input 0

```
2 1
1 2 1
4 4
2 2
3 4
1 2 5
1 3 6
2 4 2
3 4 3
4 4
2 2
3 2
1 2 5
1 3 6
2 4 2
3 4 3
4 2
2 2
3 4
1 2 5
1 3 6
0 0
```

Sample Output 0

```
1 hour
5 hours
4 hours
0 hours
```