

# Round Trip

[English](#)

[Vietnamese](#)

Jim is planning to visit one of his best friends in a town in the mountain area. First, he leaves his hometown and goes to the destination town. This is called the go phase. Then, he comes back to his hometown. This is called the return phase. You are expected to write a program to find the minimum total cost of this trip, which is the sum of the costs of the go phase and the return phase.

There is a network of towns including these two towns. Every road in this network is one-way, i.e., can only be used towards the specified direction. Each road requires a certain cost to travel.

In addition to the cost of roads, it is necessary to pay a specified fee to go through each town on the way. However, since this is the visa fee for the town, it is not necessary to pay the fee on the second or later visit to the same town.

The altitude (height) of each town is given. On the go phase, the use of descending roads is inhibited. That is, when going from town  $a$  to  $b$ , the altitude of  $a$  should not be greater than that of  $b$ . On the return phase, the use of ascending roads is inhibited in a similar manner. If the altitudes of  $a$  and  $b$  are equal, the road from  $a$  to  $b$  can be used on both phases.

## Input

The input consists of multiple datasets, each in the following format.

```
 $n$   $m$ 
 $d_2$   $e_2$ 
 $d_3$   $e_3$ 
.
.
.
 $d_{n-1}$   $e_{n-1}$ 
 $a_1$   $b_1$   $c_1$ 
 $a_2$   $b_2$   $c_2$ 
.
.
.
 $a_m$   $b_m$   $c_m$ 
```

Every input item in a dataset is a non-negative integer. Input items in a line are separated by a space.

$n$  is the number of towns in the network.  $m$  is the number of (one-way) roads. You can assume the inequalities  $2 \leq n \leq 50$  and  $0 \leq m \leq n(n-1)$  hold. Towns are numbered from 1 to  $n$ , inclusive. The town 1 is Jim's hometown, and the town  $n$  is the destination town.

$d_i$  is the visa fee of the town  $i$ , and  $e_i$  is its altitude. You can assume  $1 \leq d_i \leq 1000$  and  $1 \leq e_i \leq 999$  for  $2 \leq i \leq n-1$ . The towns 1 and  $n$  do not impose visa fee. The altitude of the town 1 is 0, and that of

the town  $n$  is 1000. Multiple towns may have the same altitude, but you can assume that there are no more than 10 towns with the same altitude.

The  $j$ -th road is from the town  $a_j$  to  $b_j$  with the cost  $c_j$  ( $1 \leq j \leq m$ ). You can assume  $1 \leq a_j \leq n$ ,  $1 \leq b_j \leq n$ , and  $1 \leq c_j \leq 1000$ . You can directly go from  $a_j$  to  $b_j$ , but not from  $b_j$  to  $a_j$  unless a road from  $b_j$  to  $a_j$  is separately given. There are no two roads connecting the same pair of towns towards the same direction, that is, for any  $i$  and  $j$  such that  $i \neq j$ ,  $a_i \neq a_j$  or  $b_i \neq b_j$ . There are no roads connecting a town to itself, that is, for any  $j$ ,  $a_j \neq b_j$ .

The last dataset is followed by a line containing two zeros (separated by a space).

## Output

For each dataset in the input, a line containing the minimum total cost, including the visa fees, of the trip should be output. If such a trip is not possible, output "-1".

## Example

### Input:

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

### Output:

```
7
8
36
-1
```