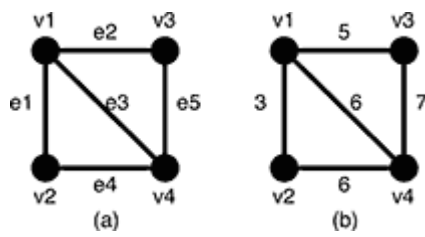


题目描述

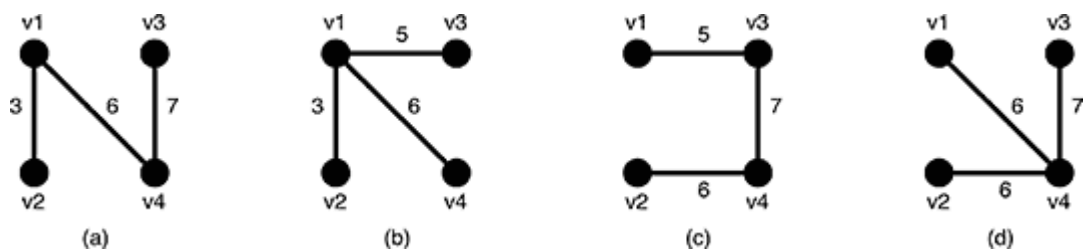
Given an undirected weighted graph G , you should find one of spanning trees specified as follows.

The graph G is an ordered pair (V, E) , where V is a set of vertices $\{v_1, v_2, \dots, v_n\}$ and E is a set of undirected edges $\{e_1, e_2, \dots, e_m\}$. Each edge $e \in E$ has its weight $w(e)$.

A spanning tree T is a tree (a connected subgraph without cycles) which connects all the n vertices with $n - 1$ edges. The slimness of a spanning tree T is defined as the difference between the largest weight and the smallest weight among the $n - 1$ edges of T .



For example, a graph G in Figure 5(a) has four vertices $\{v_1, v_2, v_3, v_4\}$ and five undirected edges $\{e_1, e_2, e_3, e_4, e_5\}$. The weights of the edges are $w(e_1) = 3$, $w(e_2) = 5$, $w(e_3) = 6$, $w(e_4) = 6$, $w(e_5) = 7$ as shown in Figure 5(b).



There are several spanning trees for G . Four of them are depicted in Figure 6(a)~(d). The spanning tree T_a in Figure 6(a) has three edges whose weights are 3, 6 and 7. The largest weight is 7 and the smallest weight is 3 so that the slimness of the tree T_a is 4. The slimnesses of spanning trees T_b , T_c and T_d shown in Figure 6(b), (c) and (d) are 3, 2 and 1, respectively. You can easily see the slimness of any other spanning tree is greater than or equal to 1,

thus the spanning tree T_d in Figure 6(d) is one of the slimmest spanning trees whose slimness is 1.

Your job is to write a program that computes the smallest slimness.

输入

The input consists of multiple datasets, followed by a line containing two zeros separated by a space. Each dataset has the following format.

```
n m
a1 b1 w1
a2 b2 w2
.....
am bm wm
```

Every input item in a dataset is a non-negative integer. Items in a line are separated by a space. n is the number of the vertices and m the number of the edges. You can assume $2 \leq n \leq 1000$ and $0 \leq m \leq 500000$. a_k and b_k ($k = 1, \dots, m$) are positive integers less than or equal to n , which represent the two vertices v_{a_k} and v_{b_k} connected by the k th edge e_k . w_k is a positive integer less than or equal to 500000, which indicates the weight of e_k . You can assume that there are no self-loops.

输出

For each dataset, if the graph has spanning trees, the smallest slimness among them should be printed. Otherwise, -1 should be printed. An output should not contain extra characters.

Manager

1120132001

题目来源

[POJ3522](#) (数据范围 $\times 10$, 大部分博客的做法无法 AC 本题)

难度评估:

思考量: ★★★

代码量: ★★★★★