Programming in Byteland

You are the chief programmer of The Kingdom of Byteland. Being the greatest kingdom of earth, Byteland has a huge number of cities, n. And it also maintains a complicated road network between them. But now global recession has also affected Byteland, and His Royal Highness, the King of Byteland is now considering cutting some cost. He has decided that not all road should be maintained. The only reason to maintain a road (as he thinks), is to make sure that his soldier can go to reach a city in case of mutiny. So, he thought if he put a battalion of soldier in each city, he no longer need to maintain any of the roads. But to his great disappointment, his military advisor informed him that, there is only $k \leq n$ battalions of troops. Now he asked you to write a program that will find minimum cost of maintaining roads, so that he can put his battalions in some of the cities and can be sure that the soldiers can reach any city in case of a mutiny. Otherwise he will hang you, and save the salary he have to pay you as part of cutting cost.

As the king is not very good at mathematics (did you expect otherwise), he thinks to minimize cost, the maximum cost of a single road among those that will be maintained should be minimized. If there is several such solution, then he wants you to find out the one minimizes total cost.

For example consider the scenario of figure 1

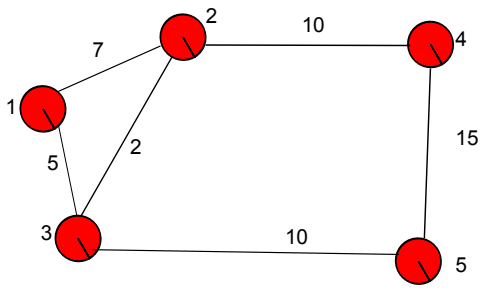

Figure 1: An example graph

Now if $k = 2$, then solution is the road network of figure 2. It has maximum cost 10.

Note that though network of figure 3 also has maximum cost 10 but, it is not solution as its total cost is 24 while the solution of figure 2 has total cost 17.

Input

The input consists of several test cases. Each test case starts with a tow number n and m in one line, representing number of cities, number of roads respectively. Where

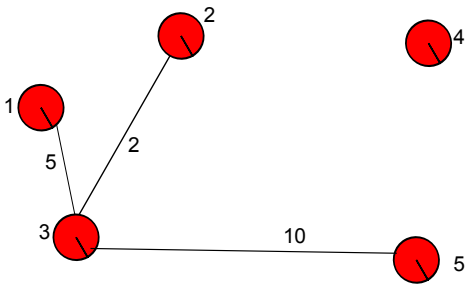

Figure 2: An example graph

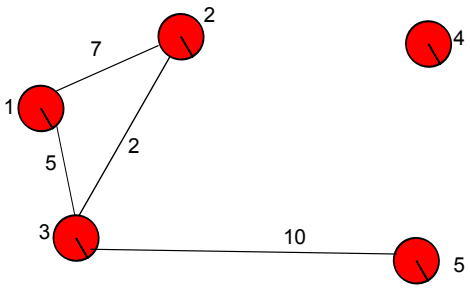

Figure 3: An example graph

$n \leq 4000$,$m \leq \frac{n(n-1)}{2}$ and $m \leq 20000$. Each of the roads are bidirectional. Following m lines describes a road by 3 number a,b and w, $1 \leq a \leq n$, $1 \leq b \leq n$, $1 \leq w \leq 100000$ and $a \neq b$. The roads connects the city a and b and its maintenance cost is w. The cities are numbered from 1 to n. Then contains a line with one integer k number of battalions. $k \leq n$. Each case is followed by an empty line.

The input is terminated two zeros on a line by itself.

Output Specification

For each of the cases in the input file, print one line containing two number, the cost of the maximum cost road and total cost in the solution as desired by the king. If no road needs to be maintained (as in third sample) both of this numbers should be zero.You may assume there will always a solution.

Sample Input

```
5 6
1 2 7
1 3 5
3 2 2
4 2 10
4 5 15
3 5 10
2

5 6
1 2 7
1 3 5
3 2 2
4 2 10
4 5 15
3 5 10
3

5 6
1 2 7
1 3 5
3 2 2
4 2 10
4 5 15
3 5 10
5

0 0
```

Sample Output

```
10 17
```

```
5 7
0 0
```

Remarks

There will be around 50 test cases. Time limit will be around 2 seconds.

An $O(m^2)$ or even $O(n^2)$ algorithm will not pass the time limit.

Input Output Explanation In the sample input given, there are three cases. The cases are separated with new line. However, the last line of input is `0`. Obviously, you should not process this as a case, rather just exit from your program. So your code should take input of cases in a loop and process them. The first two sample are the example described. It is required to follow the input output format exactly. Otherwise you will not get the mark of passing the judge data.

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