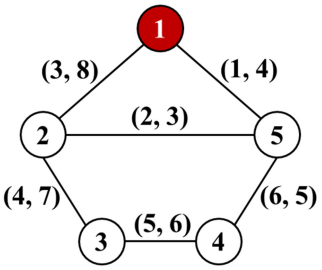
Problem B
Propagation Route
Time limit: 1 second

The epidemic of COVID-19 seriously affects the development of economis. The epidemiologist analyzed the route of infection. They found the route of infection is highly related to the distance and the frequency of people's movement between cities. The cities are connected by bidirectional roads, and the distance between two cities are the sum of the road lengths on a shortest route between them. If there is no road between two cities a and b, then the frequency of people's movement between a and b is defined as infinity. It is known that for any two pairs of adjacent cities (a, b) and (c, d), either the "distance" between a and b is different from that between c and d, or the "frequency of people's movement" between a and b is different from that between c and d. The research report of epidmiologist analysis is as follows. Among the uninfected cities, the one with the highest frequency of people's movement to an infected city will be infected first. If there are more than one uninfected cities whose frequencies of people's movement are the highest, then the one which is closest to an infected city will be infected first.

For example, there are five cities and six roads between these cities (see the following figure). For each edge e, there is a pair $(dis, freq)$ denoting the distance and the frequency of people's movement between two cities at the endpoints of e. Assume the city #1 (red node) was the first infected city. Then the propagation route is #1, #2, #3, #4, #5.



In order to prevent the spread of the epidemic, the command center hopes that the Department of Information Technology can predict the possible route of infection via the distance and the frequency of people's movement between cities. Assume that only one city will be infected every day. Please write a program to predict the propagation route.

Input File Format

There are more than one test cases in the input file. The first line of each test case contains three postive integers, $n, m, city$, where n ($2 \leq n \leq 200$) indicates the total number of cities, m ($1 \leq m \leq 20,000$) indicates the total number of roads between these n cities, and $city$ ($1 \leq city \leq 200$) indicates the first infected city. Each of the next m lines contains four

integers, $x, y, dis, freq$ ($1 \leq x, y, \leq 200, 1 \leq dis, freq \leq 20,000$), representing the distance between city x and city y is dis, and the frequency of people's movement is $freq$. The input is terminated by '`0 0 0`'.

Output Format

For each test case, output the sequence of city numbers (consecutive members of the sequence are separated by a space) describing the predicted propagation route.

Sample Input

```
5 6 1
1 2 3 8
2 3 4 7
3 4 5 6
4 5 6 5
5 1 1 4
5 2 2 3
4 5 3
1 2 1 2
2 3 2 3
3 4 3 3
4 1 4 2
1 3 5 2
0 0 0
```

Output for the Sample Input

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