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G of Graph

By Roger Eliodoro Condras, UFSC-ARA Brazil

Timelimit: 1

This problem was originally written for the first open contest I created here at URI last year, but due to an error with the test case files it cannot be included in the test in time. So it is only fair that now he is part of the warm-up for my second race. Below is the original text of the problem! :)

Last week Tobias, Gabriel and Me were choosing the questions to compose the test, and then Gabriel declared "G de Grafo huh!" and I will not deny that the idea was great. After that I had the brilliant idea of asking all the questions of the author's proof, and I regretted it a little. If resolving the issues is already difficult, generating test cases and creating validation codes can be even worse.

I confess that I tried, but no idea seemed good to mix graphs with the strike, but as it is customary for questions in the marathon to have a long text that says nothing with nothing to introduce the problem, let's imagine some story.

Let's say ... At the UFSC Campus here in Araranguá there are rooms. And between the rooms there are corridors. These corridors form paths that connect rooms with a certain length, and there may be more than one path that leaves one room to another. So far, no surprise, I am calling UFSC Campus Araranguá a graph, the apex rooms and the edge corridors. If the reader was attentive, he also noticed that the graph can have cycles and the edges are weighted. So far no surprise.

Let's also say ... Well, I don't know. For some random reason or some conspiratorial force in the universe someone. It could be Tobias, or Gabriel, or both. This ... The two want to go through all the rooms of the Campus, starting and ending the route in the same room, without creating any cycle on the route and covering the shortest possible distance during the entire path. It is possible to go through the same room or corridor more than once if necessary. Why they want to do this is a mystery even to me, I have no creativity to come up with a good excuse.

So, given the information in the graph, can you tell me which is the minimum path they need to take according to the restrictions described above? I hope so, otherwise your team will not win balloon on this issue. ;)

Input

The first line of the entry contains two integers **N** ($2 \leq N \leq 500$) and **M** ($1 \leq M \leq 124750$) that represent the number of rooms and the number of corridors on the UFSC-Araranguá campus respectively. In the second line, an integer **O** ($1 \leq O \leq N$) indicating the room they will start and end the journey. Each of the next **M** lines is composed of three integers **U**, **V** ($1 \leq U, V \leq N$ e $U \neq V$) and **D** ($1 \leq D \leq 500$) that indicate that there is a **D**-length corridor that connects rooms **U** and **V**. It is always possible to use the corridor in both directions and it is guaranteed that there are no repeated edges at the entrance.

Output

A single integer in a row. The minimum distance for Tobias and Gabriel to go through all the rooms without doing any cycle during the way, leaving and returning to the same room of origin.

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Trip Programming

Por Jessica Dagostini, beecrowd Brazil

Timelimit: 1

Valentina will start a new challenge this year: she will give programming classes! She is really excited about this new activity, once programming is one of her biggest passions. These classes will happen at afternoons, in schools of many cities of her region and she has to go to these cities by car.

As Valentina is in the 3° year of Computer Science course, she needs to go back to her city in time to go to the univerisity. The classes that she will teach end at 5:30 p.m. and her college classes start at 7:30 p.m, giving her 2 hours to come back to her city and go to her college classes.

Once that she is really smart and organized, Valentina collected information about the average travel time, in minutes, between the cities that she has to go to teach. She wrote a list with this information and enumerated the cities with numbers from 1 to **D**, where city number 1 is her city. The average time collected is bidirectional, that is, if from city 1 to city 2 the average travel time is 20 minutes, to go from city 2 to city 1 the time is the same.

Noting that she is really busy with the organization of her classes, you offered your help to build a program that discover the faster way to she goes and comes back to her destiny and if she will come back to her city in time to her college classes, or if she will be late. You know that exist at least one road that leads to each city and there's just one faster way to her travel.

Input

The input consists of several test cases. The first line of each test contains two integers **C** ($1 \leq C \leq 15$) and **E** ($1 \leq E \leq 225$), indicating the number of cities and roads. The following **E** lines have three integers C_1, C_2 and **T**, identifying the average travel time **T** between the cities C_1, C_2. In the end, an integer **D** identifies the city that Valentina needs to go to teach. A line with "0 0" ends the input.

Output

If the travel time is less than 2 hours, you need to print "Will not be late. Travel time - M - best way - C_1 $C_{...}$ C_N", where **M** is the time travel and C_N are the cities that made the best sequence. Otherwise, you need to print "It will be L minutes late. Travel time - M - best way - C_1 $C_{...}$ C_N", where **L** is the minutes of Valentina will be late.