

Nightmare

Lea had a horrible nightmare last night: Together with her friend Bea, she was in the castle of Prof. G. Ruesome. The evil professor plans to seize world domination and is about to finish preparations, but Lea and Bea found his secret. Now they need to tell the world about it in order to stop Ruesome. Horrifyingly, the alarm system observed the intruders and the professor sent his guards to catch them.

Lea and Bea want to flee from the castle to the police station, but they do not know where their pursuers are. Therefore, they decide to split up and run for their lives. It is important that at least one of them reaches the police station, so they do not want to use the same roads. It is ok if their ways intersect, but they should not use any common road. Obviously, they want the sum of their paths to be as short as possible. Help them and save the world!

Input

The first line of the input contains an integer t . t test cases follow, each of them separated by a blank line.

Each test case starts with a line containing four integers n , m , a and b where n is the number of intersections of roads, labeled from 1 to n , m is the number of roads, a is the number of the node where the castle is situated, and b is the number of the node where the police station is situated. m lines follow describing the roads. The i -th line contains three integers a_i , b_i and c_i , meaning that there is a road from intersection a_i to b_i of length c_i . Each road may be used from both directions, but not by both of them.

Output

For each test case, output one line containing "Case # i : x " where i is its number, starting at 1, and x is the minimal sum of the lengths of Lea's and Bea's paths or "impossible" if there are no such paths. Each line of the output should end with a line break.

Constraints

- $1 \leq t \leq 20$
- $1 \leq n \leq 2000$
- $0 \leq m \leq 20000$
- $1 \leq a, b \leq n$
- $a \neq b$
- $1 \leq a_i, b_i \leq n$ for all $1 \leq i \leq m$
- $1 \leq c_i \leq 100$ for all $1 \leq i \leq m$

Sample Input 1

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

6 8 1 6
1 2 1
1 3 1
2 4 1
2 5 10
3 4 1
3 5 9
4 6 1
5 6 1

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

Sample Output 1

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Case #1: impossible
Case #2: 14
Case #3: 7
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