Problem 11: Saving *Torreznos*
14 Points

Problem ID: `torreznos`

Rank: 4

Introduction

It is the year 2048. P vs NP has not been solved yet and there are no flying cars nor quantum computers. However, since Fr*nce and Spain couldn't stand each other anymore, they engaged in a nuclear war that resulted in the destruction of both nations.

The rivalry between Spain and Fr*nce can be traced back to 1808 when Napoleon told Ferdinand VII that he needed to go through Spain to invade Portugal and the Spanish king agreed on that. However, Napoleon invaded Spain *like a boss*.

Big Ben is really sad about Spain being erased from the planet since he cannot eat *torreznos* anymore. Thus, he has decided to build a time traveling machine, travel back to the 19th century and build roads in Europe so that Fr*nce can go to any country without going through Spain. To be sure that Spain does not play an UNO reverse card, he also wants to ensure that Spain can go to any country without going through Fr*nce.

Big Ben can build a lot of different roads in Europe, but each road costs CALICOins to build. Help Big Ben save his beloved *torreznos* while spending the least amount of CALICOins!

Problem Statement

You are given N countries in Europe labeled 1 to N and M possible roads that can be built between them with varying costs, and two distinct special countries Fr*nce (labeled F) and Spain (labeled S). Calculate the minimum cost that Big Ben must spend building roads such that, using those roads, there is a path from Fr*nce to every other country that does not go through Spain, and vice versa.

It is guaranteed that Big Ben can build roads that will be able to do this (if it wasn't possible, Big Ben wouldn't have bothered to build the time machine).

Input Format

The first line of the input contains a single integer T denoting the number of test cases that follow. For each test case:

- The first line contains four space-separated integers N M F S, where:
  - N denotes the number of countries in Europe.
  - M denotes the number of possible roads that can be built between countries.
  - F denotes the label of Fr*nce.
  - S denotes the label of Spain.
- For each of the next M lines, the ith line contains three space-separated integers U_i V_i W_i, representing a road from country U_i to country V_i that Big Ben can build using W_i CALICOins.

Output Format

For each test case, output a single line containing the minimum number of CALICOins that Big Ben must spend.

Constraints

Time limit: **1 second**
Memory limit: **256 MB**

$1 \leq T \leq 10$
$1 \leq N \leq 100$
$1 \leq M \leq 200$
$0 \leq F, S < N$ and $F \neq S$.
$1 \leq W_i \leq 10^4$ for all $1 \leq i \leq M$
There exists at most one possible road between each pair of countries.
It is guaranteed that there is always a solution.

Sample Test Cases

```
4
3 3 0 2
0 1 1
1 2 1
0 2 10
4 6 0 3
0 1 2
2 3 2
0 2 3
1 3 3
0 3 10
1 2 1
5 6 0 4
0 1 1
1 2 1
2 4 1
0 3 2
3 4 1
1 3 2
2 1 0 1
0 1 20
```
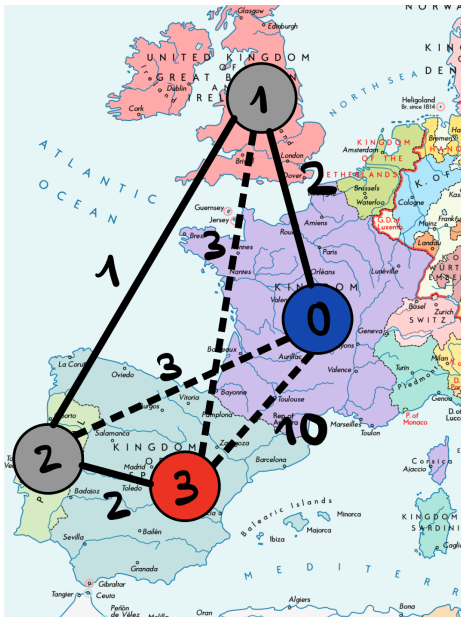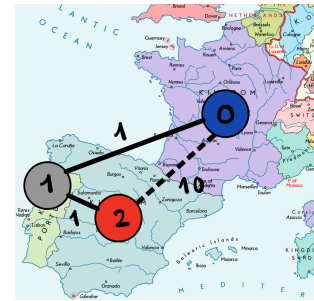
```
2
5
5
0
```

Sample Explanations

Test Case #1:

Big Ben can build only the roads from Spain $S = 2$ to Portugal (labeled 1) and from Portugal to Fr*nce $F = 0$ in order to achieve his goal with a total cost of 2 CALICOins.
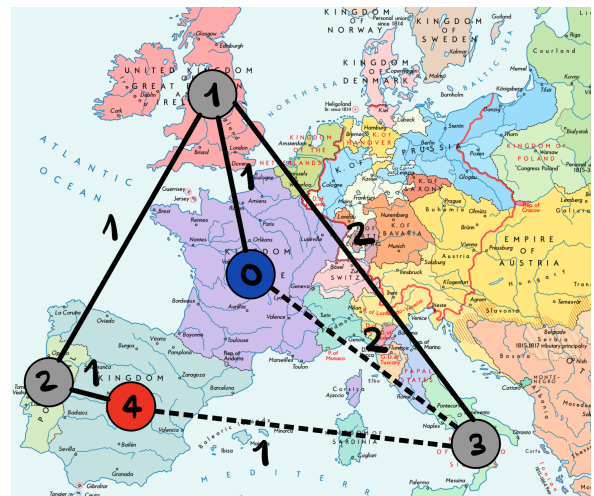

Test Case #2:

Big Ben can use 5 CALICOins to build the roads between Spain $S = 3$ and Portugal (labeled 2), Portugal and the UK (labeled 1), and the UK and Fr*nce $F = 0$ in order to achieve his goal. With this road network, you can reach both Portugal and the UK starting from either Fr*nce or Spain without passing through the other.

Test Case #3:

Big Ben can build all roads except the ones that go into Italy (labeled 3) from either Spain $S = 4$ or Fr*nce $F = 0$ to minimize cost. Even though the Spaniards have to make a long detour to go to Italy, they can do it without going through Fr*nce.

Test Case #4:

There are only two countries in this case, Spain $S = 1$ and Fr*nce $F = 0$. Since the Spaniards don't have to go to Fr*nce and the Fr*nch don't have to go to Spain, Big Ben doesn't need to build any roads, so the total cost is 0.