D Supermarkets

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It was a long time ago that Lea last saw Peter. She got to know him at school, but now she has not seen him for years. One day she met Peter by chance and he invited Lea to visit him at his new home.

A few days later when Lea wants to leave by car, she suddenly remembers that she forgot to buy a gift. Therefore, she decides to buy a bottle of wine at some supermarket on her way to Peter. She wants to be on time, so the extra way and time needed to buy the wine should be as short as possible. Some of the supermarkets are huge malls where she would need a lot of time to get her wine, some are known for long waiting times and others are very small and perfect for getting just one item. Lea knows the lengths of all roads, the locations of all supermarkets and the time she would need to buy the wine in each store. Where should she buy the wine to reach Peter as fast as possible?

Input

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

Each test case starts with a single line containing five integers n, m, s, a and b. n is the number of cities (labelled city 1 to city n), m is the number of roads and s is the number of supermarkets. Lea lives in city a whereas Peter lives in city b.

Next, there are m lines describing the roads. The i-th line contains three integers x_i, y_i and z_i and implies that there is a road between city x_i and city y_i (which may be used in both directions) for which Lea will need z_i minutes. s lines follow describing the supermarkets. The j-th line contains two integers c_j and w_j describing a supermarket in city c_j where Lea will need w_j minutes to buy the wine. Note that there may be multiple roads between cities as well as multiple supermarkets per city.

Output

For each test case, print a line containing "Case #i: x" where i is its number, starting at 1, and x is the time she needs to go to Peter formatted as "hours:minutes", for instance "5:23" (add leading zeros to the number of minutes if needed) or "impossible" if there is no way to Peter's house.

Constraints

- $1 \leq t \leq 20$
- $2 \leq n \leq 10000$
- $0 \leq m \leq n^2$

- $1 \leq a \leq n$
- $1 \leq b \leq n$
- $0 \leq s \leq n$
- $1 \leq x_i, y_i \leq n$ for all $1 \leq i \leq m$
- $1 \leq z_i \leq 100$ for all $1 \leq i \leq m$
- $1 \leq c_j \leq n$ for all $1 \leq j \leq s$
- $1 \leq w_i \leq 1000$ for all $1 \leq j \leq s$

Sample Data

Input

```
10
2 1 2 1 2
1 2 30
1 15
2 20

2 1 0 1 2
1 2 30

5 5 1 4 2
3 5 18
2 5 14
3 1 5
1 2 14
4 3 1
3 100

3 1 2 1 2
1 2 1
2 45
3 72

3 1 0 3 1
2 3 14

5 0 0 3 1

6 0 1 1 3
4 106

7 5 3 7 2
7 7 14
1 1 16
6 3 5
6 2 14
7 6 17
4 119
3 48
2 103

2 0 1 2 1
2 110

4 3 3 4 2
4 2 18
2 4 15
4 4 18
3 60
1 91
4 83
```

Output

```
Case #1: 0:45
Case #2: impossible
Case #3: 2:00
Case #4: 0:46
Case #5: impossible
Case #6: impossible
Case #7: impossible
Case #8: 1:29
Case #9: impossible
Case #10: 1:38
```