

Qualification Round 2013

[A. Tic-Tac-Toe-Tomek](#)[B. Lawnmower](#)[C. Fair and Square](#)**D. Treasure**[Contest Analysis](#)[Questions asked](#)

Submissions

Tic-Tac-Toe-Tomek

10pt	Not attempted 19860/21861 users correct (91%)
20pt	Not attempted 16122/19755 users correct (82%)

Lawnmower

10pt	Not attempted 12579/14509 users correct (87%)
30pt	Not attempted 10569/12136 users correct (87%)

Fair and Square

10pt	Not attempted 17569/18199 users correct (97%)
35pt	Not attempted 6080/15270 users correct (40%)
55pt	Not attempted 872/3725 users correct (23%)

Treasure

20pt	Not attempted 1359/4458 users correct (30%)
60pt	Not attempted 141/547 users correct (26%)

Top Scores

netkuba	250
pieguy	250
tanakh	250
cgy4ever	250
STEP5	250
Khark	250
Balajiganapathi	250
sohelH	250
krijgertje	250
romanandreev	250

Problem D. Treasure

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the [Quick-Start Guide](#) to get started.

Small input
20 points

Solve D-small

Large input
60 points

Solve D-large

Problem

Following an old map, you have stumbled upon the Dread Pirate Larry's secret treasure trove!

The treasure trove consists of **N** locked chests, each of which can only be opened by a key of a specific type. Furthermore, once a key is used to open a chest, it can never be used again. Inside every chest, you will of course find lots of treasure, and you might also find one or more keys that you can use to open other chests. A chest may contain multiple keys of the same type, and you may hold any number of keys.

You already have at least one key and your map says what other keys can be found inside the various chests. With all this information, can you figure out how to unlock all the chests?

For example, suppose the treasure trove consists of four chests as described below, and you began with exactly one key of type 1:

Chest Number	Key Type To Open Chest	Key Types Inside
1	1	None
2	1	1, 3
3	2	None
4	3	2

You can open all the chests in this example if you do them in the order 2, 1, 4, 3. If you start by opening chest #1 first, then you will have used up your only key, and you will be stuck.

Input

The first line of the input gives the number of test cases, **T**. **T** test cases follow. Each test case begins with a single line containing two positive integers **K** and **N**, representing the number of keys you start with and the number of chests you need to open.

This is followed by a line containing **K** integers, representing the types of the keys that you start with.

After that, there will be **N** lines, each representing a single chest. Each line will begin with integers **T_i** and **K_i**, indicating the key type needed to open the chest and the number of keys inside the chest. These two integers will be followed by **K_i** more integers, indicating the types of the keys contained within the chest.

Output

For each test case, output one line containing "Case #x: C₁ C₂ ... C_N", where x is the case number (starting from 1), and where C_i represents the index (starting from 1) of the ith chest that you should open.

If there are multiple ways of opening all the chests, choose the "lexicographically smallest" way. In other words, you should choose to make C₁ as small as possible, and if there are multiple ways of making C₁ as small as possible, choose the one that makes C₂ as small as possible, and so on.

If there is no way to open all the chests, you should instead output one line containing "Case #x: IMPOSSIBLE".

Limits

1 ≤ **T** ≤ 25.

1 ≤ **K**.

All key types will be integers between 1 and 200 inclusive.

Small dataset

1 ≤ **N** ≤ 20.

In each test case, there will be at most 40 keys altogether.

Large dataset

$1 \leq N \leq 200$.

In each test case, there will be at most 400 keys altogether.

Sample

Input	Output
3	Case #1: 2 1 4 3
1 4	Case #2: 1 2 3
1	Case #3: IMPOSSIBLE
1 0	
1 2 1 3	
2 0	
3 1 2	
3 3	
1 1 1	
1 0	
1 0	
1 0	
1 1	
2	
1 1 1	

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