Problem G

Room Assignments

Once there was an inventor congress, where inventors from all over the world met in one place. The organizer of the congress reserved exactly one hotel room for each inventor. Each inventor, however, had its own preference regarding which room he would like to stay in. Being a clever inventor himself, the organizer soon found an objective way of doing the room assignments in a fair manner: each inventor wrote two different room numbers on a fair coin, one room number on each side. Then, each inventor threw his coin and was assigned the room number which was shown on the upper side of his coin. If some room had been assigned to more than one inventor, all inventors had to throw their coins again.

As you can imagine, this assignment process could take a long time or even not terminate at all. It has the advantage, however, that among all possible room assignments, one assignment is chosen randomly according to a uniform distribution. In order to apply this method in modern days, you should write a program which helps the organizer.

The organizer himself needs a hotel room too. As the organizer, he wants to have some advantage: he should be able to rate each of the rooms (the higher the rating, the better), and the program should tell him which two room numbers he should write on his coin in order to maximize the expected rating of the room he will be assigned to. The program also has access to the choices of the other inventors before making the proposal. It should never propose two rooms for the organizer such that it is not possible to assign all inventors to the rooms, if a valid assignment is possible at all.

Input

The input starts with a single number c ($1 \leq c \leq 200$) on one line, the number of test cases. Each test case starts with one line containing a number n ($2 \leq n \leq 50\,000$), the number of inventors and rooms. The following $n-1$ lines contain the choices of the $n-1$ guests (excluding the organizer). For each inventor, there is a line containing two numbers a and b ($1 \leq a < b \leq n$), the two room numbers which are selected by the inventor. The last line of each test case consists of n integers $v_1, \ldots, v_n$ ($1 \leq v_i \leq 1\,000\,000$), where v_i is the organizer's rating for room i.

Output

For each test case, print a single line containing the two different room numbers a and b which should be selected by the organizer in order to maximize the expected rating of the room he will be assigned to. If there is more than one optimal selection, break ties by choosing the smallest a and, for equal a, the smallest b. If there is no way for the organizer to select two rooms such that an assignment of inventors to rooms is possible, print "`impossible`" instead.

Sample Input

```
3
4
1 2
2 3
1 3
2 3 4 1
3
1 2
2 3
100 40 70
5
1 2
1 2
1 2
3 4
1 1 1 1 1
```

Sample Output

```
1 4
1 3
impossible
```

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