

A. Planet Distance

[B. Fairies and Witches](#)[C. Kickstart Alarm](#)[Ask a question](#)[View my submissions](#)

Submissions

Planet Distance

10pt	Not attempted 239/386 users correct (62%)
15pt	Not attempted 235 users attempted

Fairies and Witches

15pt	Not attempted 10/16 users correct (63%)
21pt	Not attempted 8 users attempted

Kickstart Alarm

13pt	Not attempted 23/29 users correct (79%)
26pt	Not attempted 10 users attempted

Top Scores

nuip	100
alex20030190	74
rkm0959	64
rapel	64
thundercracker	64
teomrn	64
phirasit	64
Nyan101	64
OnionPringles	64
nhho	61

Problem A. Planet Distance

Confused? Read the [quick-start guide](#).Small input
10 points

Solve A-small

You may try multiple times, with penalties for wrong submissions.

Large input
15 points

You must solve the small input first.

You have 8 minutes to solve 1 input file. (Judged after contest.)

Problem

There are N planets in the universe, and Google's Space division has installed N vacuum tubes through which you can travel from one planet to another. The tubes are bidirectional; travelers may use a tube between two planets to travel from either of those planets to the other. Each vacuum tube connects two planets and no two vacuum tubes connect the same pair of planets. These tubes connect the planets such that it is possible to travel from any planet to any other planet using one or more of them. Some of these tubes are connected such that there exists exactly one cycle in the universe. Google has hidden gifts in all the planets that are part of this cycle. Now, Google wants to know how far away each of the planets in the universe is from the gifts.

Your task is to find the minimum distance (in terms of the number of vacuum tubes) between each planet and a planet that is part of the cycle. Planets that are part of the cycle are assumed to be at distance 0.

Input

The first line contains an integer T , the number of test cases. T test cases follow. The first line of each test case contains an integer N , the number of planets and vacuum tubes. The planets are numbered from 1 to N . N lines follow, the i -th of these lines contains two integers x_i and y_i , indicating that the i -th vacuum tube connects planet x_i and planet y_i .

Output

For each test case, output one line containing Case # x : y , where x is the test case number (starting from 1) and y is a list of N space-separated values in which the i -th value represents the minimum distance between the i -th planet and a planet in the cycle.

Limits

 $1 \leq T \leq 100$. $1 \leq x_i \leq N$, for all i . $1 \leq y_i \leq N$, for all i . $x_i \neq y_i$, for all i . $(x_i, y_i) \neq (x_j, y_j)$, for all $i \neq j$.

The graph in which planets are nodes and tubes are edges is connected and has exactly one cycle.

Small dataset

 $3 \leq N \leq 30$.

Large dataset

 $3 \leq N \leq 1000$.

Sample

Input	Output
2	Case #1: 1 0 0 0 1
5	Case #2: 0 0 0
1 2	
2 3	
3 4	
2 4	
5 3	
3	
1 2	
3 2	
1 3	

In Sample Case #1, the cycle consists of planets 2, 3, and 4. Therefore, the distances for planets 2, 3, and 4 are 0. There is a vacuum tube between 1 and 2, and another vacuum tube between 3 and 5. Thus, planets 1 and 5 are at a distance 1 from the cycle.

In Sample Case #2, all the planets are part of the cycle. Hence, their distances are 0.

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