

Round 1C 2012

**A. Diamond Inheritance**[B. Out of Gas](#)[C. Box Factory](#)[Contest Analysis](#)[Questions asked](#)

## Submissions

## Diamond Inheritance

14pt Not attempted  
3062/4215 users  
correct (73%)14pt Not attempted  
2374/3030 users  
correct (78%)

## Out of Gas

10pt Not attempted  
467/762 users  
correct (61%)27pt Not attempted  
73/250 users  
correct (29%)

## Box Factory

12pt Not attempted  
1064/1800 users  
correct (59%)23pt Not attempted  
308/786 users  
correct (39%)

## Top Scores

|                 |     |
|-----------------|-----|
| mystic          | 100 |
| sourspinach     | 100 |
| meret           | 100 |
| FloppyCat       | 100 |
| Yao             | 100 |
| AS1             | 100 |
| fuseidenamida   | 100 |
| Tan909090909090 | 100 |
| AdrianRoos      | 100 |
| MaxBuzz         | 100 |

**Problem A. Diamond Inheritance**

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  
14 points

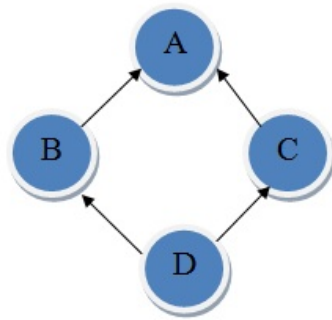
Solve A-small

Large input  
14 points

Solve A-large

**Problem**

You are asked to help diagnose class diagrams to identify instances of diamond inheritance. The following example class diagram illustrates the property of diamond inheritance. There are four classes: A, B, C and D. An arrow pointing from X to Y indicates that class X inherits from class Y.



In this class diagram, D inherits from both B and C, B inherits from A, and C also inherits from A. An inheritance path from X to Y is defined as a sequence of classes  $X, C_1, C_2, C_3, \dots, C_n, Y$  where X inherits from  $C_1$ ,  $C_i$  inherits from  $C_{i+1}$  for  $1 \leq i \leq n-1$ , and  $C_n$  inherits from Y. There are two inheritance paths from D to A in the example above. The first path is D, B, A and the second path is D, C, A.

A class diagram is said to contain a diamond inheritance if there exists a pair of classes X and Y such that there are at least two different inheritance paths from X to Y. The above class diagram is a classic example of diamond inheritance. Your task is to determine whether or not a given class diagram contains a diamond inheritance.

**Input**

The first line of the input gives the number of test cases, **T**. **T** test cases follow, each specifies a class diagram. The first line of each test case gives the number of classes in this diagram, **N**. The classes are numbered from 1 to **N**. **N** lines follow. The  $i^{\text{th}}$  line starts with a non-negative integer  $M_i$  indicating the number of classes that class  $i$  inherits from. This is followed by  $M_i$  distinct positive integers each from 1 to **N** representing those classes. You may assume that:

- If there is an inheritance path from X to Y then there is no inheritance path from Y to X.
- A class will never inherit from itself.

**Output**

For each diagram, output one line containing "Case #x: y", where x is the case number (starting from 1) and y is "Yes" if the class diagram contains a diamond inheritance, "No" otherwise.

**Limits**

$1 \leq T \leq 50$ .  
 $0 \leq M_i \leq 10$ .

**Small dataset**

$1 \leq N \leq 50$ .

**Large dataset**

$1 \leq N \leq 1,000$ .

**Sample**

| Input | Output       |
|-------|--------------|
| 3     | Case #1: No  |
| 3     | Case #2: Yes |
| 1 2   | Case #3: Yes |
| 1 3   |              |
| 0     |              |
| 5     |              |
| 2 2 3 |              |
| 1 4   |              |
| 1 5   |              |
| 1 5   |              |
| 0     |              |
| 3     |              |
| 2 2 3 |              |
| 1 3   |              |
| 0     |              |

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