2279   Counterfeit Coins

The "Great Expectations" Popular Bank is verifying the deposits it holds. A deposit is a pile of coins of equal weight. The secret service came with the information that *precisely one coin from each deposit has been replaced with a counterfeit coin*, which is lighter or heavier than any other coin in the deposit. Take for granted this information and write a program that verifies the deposits. For each deposit and the outcome of a series of weighting tests the program tries to find the bad coin and its relative weight.

Input

The program input is from a text file. Each data set in the file stands for a deposit and has the format:

$N \ M \ weighting\_test_1 \ldots weighting\_test_M$

$3 \leq N \leq 1000$ is the number of coins in the deposit, and $M \geq 0$ is the number of weighting tests. The coins are identified by numbers from 1 to N. A *weighting_test* has the format:

$coin_1 \ \ldots \ coin_{w/2} \ needle \ coin_{w/2+1} \ \ldots \ coin_w$

where $w > 0$ is the even number of weighted coins $1 \leq coin_k \leq N$, $k = 1, w$, $coin_i \neq coin_j$ for $i \neq j$.

Coins $coin_1 \ldots coin_{w/2}$ are placed on the left pan of the scale; coins $coin_{w/2+1} \ldots coin_w$ are placed on the right pan of the scale. The *needle* is one of the characters '\,|,/' as follows:
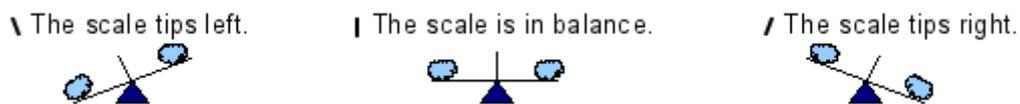
Data items in the input are separated by at least one white space. The input data comply fully with the format above but may be logically inconsistent or incomplete *with regard to the problem assumption.*

Output

The result for each deposit is printed on standard output as shown below.

Result	Meaning
`Coin # is light`	The coin numbered # is counterfeit and it is light.
`Coin # is heavy`	The coin numbered # is counterfeit and it is heavy.
`Inconsistent data`	The assumption is contradicted or conflicting conclusions on the kind of coins (honest or bad) follow from data and problem's assumption.
`Incomplete data`	Data do not provide sufficient information to find the counterfeit coin and its relative weight.

NOTES: The examples below span some possible cases of correct, inconsistent or incomplete input data.

The first data set is for 3 coins and 2 weighting tests. The test 1 | 2 weights coins 1 and 2. Since the scale is in balance both coins are honest. The test 1 \ 3 weights coins 1 and 3. The scale tips left and, therefore, coin 3 is light.

The second data set (3 coins, 2 tests) contradicts the problem assumption since all coins are honest.

In the third data set the weighting tests lead to contradictory conclusions: a) both 1 and 2 are honest, and b) one of 1 and 2 is counterfeit.

In the fourth data set (3 coins, 1 weighting test) coin 3 is counterfeit but we do not know whether it is light or heavy.

In the last data set one coin out of 3 and 4 is light but we cannot tell which.

Sample Input

```
3 2   1 | 2   1 \ 3
3 2   1 | 2   1 | 3
3 2   1 | 2   1 \ 2
3 1   1 | 2
4 2   1 | 2   1 2 \ 3 4
```

Sample Output

```
Coin 3 is light
Inconsistent data
Inconsistent data
Incomplete data
Incomplete data
```