Problem B: Sorting It All Out

An ascending sorted sequence of distinct values is one in which some form of a less-than operator is used to order the elements from smallest to largest. For example, the sorted sequence A, B, C, D implies that $A < B$, $B < C$ and $C < D$. In this problem, we will give you a set of relations of the form $A < B$ and ask you to determine whether a sorted order has been specified or not.

Input

Input consists of multiple problem instances. Each instance starts with a line containing two positive integers n and m. The first value indicates the number of objects to sort, where $2 \le n \le 26$. The objects to be sorted will be the first n characters of the uppercase alphabet. The second value m indicates the number of relations of the form $A < B$ which will be given in this problem instance. Next will be m lines, each containing one such relation consisting of three characters: an uppercase letter, the character "<" and a second uppercase letter. No letter will be outside the range of the first n letters of the alphabet. Values of $n = m = 0$ indicate end of input.

Output

For each problem instance, output consists of one line. This line should be one of the following three:

Sorted sequence determined after *xxx* relations: *yyy...y*.
Sorted sequence cannot be determined.
Inconsistency found after *xxx* relations.

where *xxx* is the number of relations processed at the time either a sorted sequence is determined or an inconsistency is found, whichever comes first, and *yyy...y* is the sorted, ascending sequence.

Sample Input

```
4 6
A<B
A<C
B<C
C<D
B<D
A<B
3 2
A<B
B<A
26 1
A<Z
0 0
```

Sample Output

```
Sorted sequence determined after 4 relations: ABCD.
Inconsistency found after 2 relations.
Sorted sequence cannot be determined.
```