

Problem 10361**Automatic Poetry****Input:** standard input **Output:** standard output**Time Limit:** 2 seconds **Memory Limit:** 32 MB

“Oh God”, Lara Croft exclaims, “it’s one of these dumb riddles again!”

In Tomb Raider XIV, Lara is, as ever, gunning her way through ancient Egyptian pyramids, prehistoric caves and medieval hallways. Now she is standing in front of some important Germanic looking doorway and has to solve a linguistic riddle to pass. As usual, the riddle is not very intellectually challenging.

This time, the riddle involves poems containing a “Schuttelreim”. An example of a Schuttelreim is the following short poem:

```
Ein Kind halt seinen Schnabel nur,
wenn es hängt an der Nabelschnur.
```

/*German contestants please forgive me. I had to modify something as they were not appearing correctly in plain text format*/

A Schuttelreim seems to be a typical German invention. The funny thing about this strange type of poetry is that if somebody gives you the first line and the beginning of the second one, you can complete the poem yourself. Well, even a computer can do that, and your task is to write a program which completes them automatically. This will help Lara concentrate on the “action” part of Tomb Raider and not on the “intellectual” part.

Input

The input will begin with a line containing a single number n . After this line follow n pairs of lines containing Schuttelreims. The first line of each pair will be of the form

$$s_1 < s_2 > s_3 < s_4 > s_5$$

where the s_i are possibly empty, strings of lowercase characters or blanks. The second line will be a string of lowercase characters or blanks ending with three dots “...”. Lines will be at most 100 characters long.

Output

For each pair of Schuttelreim lines l_1 and l_2 you are to output two lines c_1 and c_2 in the following way: c_1 is the same as l_1 only that the bracket marks “<” and “>” are removed. Line c_2 is the same as l_2 , except that instead of the three dots the string $s_4 s_3 s_2 s_5$ should appear.

Sample Input

```
3
ein kind haelt seinen <schn>abel <n>ur
wennes haengt an der ...
weil wir zu spaet zur <>oma <k>amen
verpassten wir das ...
<d>u <b>ist
...
```

Sample Output

```
ein kind haelt seinen schnabel nur
wennes haengt an der nabel schnur
weil wir zu spaet zur oma kamen
verpassten wir das koma amen
du bist
bu dist
```

Problem 644

Immediate Decodability

An encoding of a set of symbols is said to be *immediately* decodable if no code for one symbol is the prefix of a code for another symbol. We will assume for this problem that all codes are in binary, that no two codes within a set of codes are the same, that each code has at least one bit and no more than ten bits, and that each set has at least two codes and no more than eight.

Examples: Assume an alphabet that has symbols {A, B, C, D}

The following code is immediately decodable:

A:01 B:10 C:0010 D:0000

but this one is not:

A:01 B:10 C:010 D:0000 (Note that A is a prefix of C)

Input

Write a program that accepts as input a series of groups of records from a data file. Each record in a group contains a collection of zeroes and ones representing a binary code for a different symbol. Each group is followed by a single separator record containing a single 9; the separator records are not part of the group. Each group is independent of other groups; the codes in one group are not related to codes in any other group (that is, each group is to be processed independently).

Output

For each group, your program should determine whether the codes in that group are immediately decodable, and should print a single output line giving the group number and stating whether the group is, or is not, immediately decodable.

The Sample Input describes the examples above.

Sample Input

```
01
10
0010
0000
9
01
10
010
0000
9
```

Sample Output

Set 1 is immediately decodable

Set 2 is not immediately decodable