

1. Range processing

Suppose you have a collection of ranges, each associated with a label. (The ranges are inclusive of their end points.) Write a program to find the range intersections and non-intersections.

Input

Each test case will include a sequence of ranges in the form
Label. low .. high

Output

A minimal ordered list of non-overlapping ranges each of which has an associated list containing the labels of the original ranges that include that range as a subrange.

Sample Input

```
a. 10 .. 20
b. 5 .. 13
c. 22 .. 50
d. 12 .. 35
e. 40 .. 42
f. 1 .. 3
```

Sample Output

```
1 .. 3: f
5 .. 9: b
10 .. 11: a, b
12 .. 13: a, b, d
14 .. 20: a, d
21 .. 21: d
22 .. 35: c, d
36 .. 39: c
40 .. 42: c, e
43 .. 50: c
```