Gossip   P47386_en

Write a program to maintain basic information for the gossip magazines: who is a couple of who. There are two kinds of orders: "`info`" and "`affair`" x y. The first asks for a list of all the information at that moment. The second indicates that x and y are a couple now. If some person z was a couple of x or a couple of y, then z becomes single.

Input

Input consists of several orders. For every "`affair`" x y order, both x and y are words made up of only lowercase letters, such that x and y are different, and such that x and y do not have an affair at that moment.

Output

Print as many lists as "`info`" orders, finishing each with a line with 10 dashes. Print the couples in alphabetical order, and also the couples among them. Print the alone people in alphabetical order as well.

Observation

In the private test cases, most orders are of the "`affair`" kind.

Sample input 1

```
affair gerard shakira
info
affair sara iker
info
affair gerard sara
info
affair iker cristiano
info
```

Sample output 1

```
COUPLES:
gerard shakira
ALONE:
----------
COUPLES:
gerard shakira
iker sara
ALONE:
----------
COUPLES:
gerard sara
ALONE:
iker
shakira
----------
COUPLES:
cristiano iker
gerard sara
ALONE:
shakira
----------
```

Sample input 2

```
info
affair ba a
affair b ab
affair aab ac
info
affair ac b
affair b ab
info
```

Sample output 2

```
COUPLES:
ALONE:
----------
COUPLES:
a ba
aab ac
ab b
ALONE:
----------
COUPLES:
a ba
ab b
ALONE:
aab
ac
----------
```

Problem information

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