Invert-a-dict (2) T40928_en

A dictionary where values are lists can be *inverted* obtaining another dictionary where the keys are the elements in value lists of the original dictionary, and values are lists of the original keys.

1. Program a function $inverse(d)$ that given an dictionary d with string keys and lists of strings as values, returns its inverse.

   For instance, if the original dictionary d is:

   ```
   { 'John' : ['AP1', 'CAOS', 'POC', 'MB'],
     'Mary' :  ['CAOS', 'MB', 'ALG'],
     'Sheila' : ['CAL']
     'Peter' :  ['AP1', 'ALG', 'POC', 'CB', 'MB']
   }
   ```

   the function will return

   ```
   { 'AP1': ['John', 'Peter'],
     'CAOS': ['John', 'Mary'],
     'POC': ['John', 'Peter'],
     'MB': ['John', 'Mary', 'Peter'],
     'ALG': ['Mary', 'Peter'],
     'CAL': ['Sheila']
     'CB': ['Peter']
   }
   ```

2. Write a main program that reads a dictionary, uses the $inverse(d)$ function to obtain the inverted dictionary, and prints the result.

Input

The input is a dictionary in the following format:

- Each line contains several strings separated by whitespaces, describing a single dictionary entry.
- The first string in the line is the key, and the remaining strings are the list of values for that key.
- Each line has at least two string (the key plus at least one element for the list value).
- All strings in the list value for a key are different.

Output

The output is the inverted dictionary. Keys are printed in lexicographical order, and so are their corresponding lists of values. Follow the format of the examples.

Sample input 1

```
John AP1 CAOS POC MB
Mary CAOS MB ALG
Sheila CAL
Peter AP1 ALG POC CB MB
```

Sample output 1

```
ALG: Mary Peter
AP1: John Peter
CAL: Sheila
CAOS: John Mary
CB: Peter
MB: John Mary Peter
POC: John Peter
```

Sample input 2

```
carrots 3 4 5
potatoes 1 2 3 4
spinach 4 5 6 7 8
oranges 5 6
apples 2
```

Sample output 2

```
1: potatoes
2: apples potatoes
3: carrots potatoes
4: carrots potatoes spinach
5: carrots oranges spinach
6: oranges spinach
7: spinach
8: spinach
```

Sample input 3

```
john twitter insta github linkedin
peter insta facebook
mary twitter github facebook
sheila insta github
```

Sample output 3

```
facebook: mary peter
github: john mary sheila
insta: john peter sheila
linkedin: john
twitter: john mary
```

Problem information

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