

Summary

Many computer games allow players to craft items in-game by combining raw materials using a crafting interface. The list of materials used to craft an item is often called a recipe and the materials are called ingredients. Also, items that have been crafted may sometimes be used as crafting ingredients for other items.

If all of this sounds like it could get confusing, well, yeah, it can. Players who want to craft the Uber Awesome Hammer of Poundation may find themselves lost in the details of how many Iron Icicles they actually need to collect before the thing is finally made. That's where you can help.

Write a program to print a list of all the raw materials required to craft an item.

Input

The input file will consist of two sections. The first line is the number of recipes, followed by one recipe per line. Each recipe consists of an item name, the number of ingredients, followed by the number and name of each ingredient. Recipes will have two to four ingredients. After the recipes, each line will contain the name of an item to be crafted. All names are in CamelCase, so there are no spaces in the names. The input ends with the word GO.

```
9
UberHammerOfPoundation 3 1 UberHammerHead 1 UberShaft 1 UberHandle
UberShaft 3 3 IronIcicle 1 IridiumBar 1 MarkOfUber
UberHammerHead 3 1 MarkOfUber 4 IronIcicle 1 IridiumBall
UberShovelBlade 3 1 MarkOfUber 1 IridiumBar 4 IronIcicle
IronIcicle 2 5 IronLump 15 IceCrystal
MarkOfUber 3 7 PlatinumFlake 15 MagnesiumDust 1 IridiumNugget
IridiumBar 2 10 IridiumNugget 1 PlatinumFlake
IridiumBall 2 8 IridiumNugget 1 IronLump
UberHandle 3 1 RawhideStrap 1 BlackDye 1 RollDuctTape
UberHammerOfPoundation
UberShovelBlade
GO
```

Output

The program must print the name of each item the player wants to craft enclosed in square brackets, followed by the name and quantity of all raw materials. Any ingredient that has no recipe is a raw material. Each raw material used in the final item must be printed exactly once with the total quantity required for the final item. The raw materials must be printed in alphabetic order.

```
[UberHammerOfPoundation]
BlackDye 1
IceCrystal 105
IridiumNugget 20
IronLump 36
MagnesiumDust 30
PlatinumFlake 15
RawhideStrap 1
RollDuctTape 1
[UberShovelBlade]
IceCrystal 60
IridiumNugget 11
IronLump 20
MagnesiumDust 15
PlatinumFlake 8
```

