Honest politicians   P80094_en
Onzè Concurs de Programació de la UPC - Semifinal (2013-06-19)

In a distant country, judges are busy trying to find out how much money several politicians have earned as the result of some money movements. There are three kinds of transactions:

- R *name number*: Politician *name* receives *number* money (from some unknown bank).

- G *name number*: Politician *name* gives *number* money (to some unknown relative).

- P *name1 number name2*: Politician *name1* pays *number* money to politician *name2*, where *name1* and *name2* are different.

Could you please compute the final earnings of every politician?

Input

Input consists of several cases. Each case begins with a natural number *r*. Follow between 1 and 10^4 transactions. Every case ends with "END". You can assume that *r* is between 1 and the number of different names in the case, that all the names are strings made up of an uppercase letter followed by between 1 and 10 lowercase letters, and that all given numbers are natural numbers between 1 and 10^5.

Output

For every case, print *r* rows with the name and the final money of every politician. Names should be alphabetically sorted by columns. Every column has to be as narrow as possible, with names aligned to the left, money aligned to the right, and at least one space separating them. Separate columns with a vertical bar surronded by two spaces. The last column may be partially empty: always leave those empty positions at the bottom of the column. Print a line with 40 '*' after every case. Take a look at the sample output to exactly follow its format. Note that no line should end with any space.

Sample input

```
2
R Smith 1000
G Taylor 20000
END

1
P Taylor 20000 Smith
END

3
P Blue 3 Red
G Brown 100000
R Blue 3
R Orange 5000
P White 1 Blonde
R Pink 12345
END
```

Sample output

```
Smith   1000
Taylor -20000
****************************************
Smith 20000 | Taylor -20000
****************************************
Blonde      1 | Orange 5000 | White -1
Blue        0 | Pink  12345
Brown -100000 | Red       3
****************************************
```

Problem information

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