Grandparents and grandchildren   P87093_en

Working with trees, to use family terminology is frequent. Thus, is said that a node is parent of another one, or child, or sibling, etcetera, with the equivalent meaning as the tree was genealogical.

Write a program that reads various general trees, and for each one prints all their relationships grandparent–grandchildren.

Input

Input is a sequence of general trees of words, with the format of the exercise . All the words of the same tree are different.

Output

For each given tree, your program must print all the relationships grandparent–grandchildren in lexicogaphically order. Print a line in white after the output of each tree. Follow the format of the instance.

Sample input

```
12
L 3  K 2  J 0  I 1  H 1  G 0  F 0  E 4  D 0  C 0  B 0  A 0

3
Peter 2  John 0  Joseph 0

4
Peter 2  John 1  Joseph 0  Mary 0
```

Sample output

```
relationships grandparent-grandchildren:
I G
K H
L A
L B
L C
L D
L I
L J

relationships grandparent-grandchildren:

relationships grandparent-grandchildren:
Peter Joseph
```

Problem information