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## Grandparents and grandchildren

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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 lexicographically 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**

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