Problem A. Again GPA problem

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

We are dealing one more problem about GPA. You are given the name of the student and his or her GPA for some semester. For one student, there may be several records of GPA (for different semesters). The overall GPA of a student is calculated as average of all his or her GPA-s across the semester.
Your task is to calculate overall GPA for all students, and print this information sorted by students' names alphabetically.

Input

The first line of input contains an integer n ($1 \leq n \leq 10000$) - number of records of students' GPA. Each of the next n lines contains a student's name and an integer - his GPA for some semester ($1 \leq GPA \leq 4$).

Output

Your should print name of student and his or her overall GPA in format "*name*: *overallGPA*" for each student on separate line. Students' names should be sorted alphabetically. You should print overall GPA with exactly 3 decimal places.

Examples

standard input	standard output
3 asman 4 pes 2 asman 4	asman: 4.000 pes: 2.000
6 abc 4 bcd 1 abc 2 abc 1 bcd 3 cde 2	abc: 2.333 bcd: 2.000 cde: 2.000

Note

To achieve desired precision you can use string formatting. For example the string `f'{value:.3f}'` will print *value* with exactly 3 decimal places.

Problem B. Bonus tasks

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

On Discrete structures subject, the teacher Amanov has given a lot of bonus tasks. Every time a student has solved a bonus task, Amanov wrote his name on paper. Now, having list of all students who has solved bonus tasks, teacher wants to count how many tasks each of student has solved. Help him with accomplishing this task.

Input

You are given a string s ($1 \leq |s| \leq 10000$) of space separated students' name.

Output

For each student, print his name and number of tasks he has solved (separate these values by dash) on a separate line. Students' names should be sorted alphabetically.

Examples

standard input	standard output
askar bobur bobur beisenbek	askar - 1 beisenbek - 1 bobur - 2
asman zhandos zhandos aidos asman asman	aidos - 1 asman - 3 zhandos - 2

Problem C. Say Hi

Input file:	`standard input`
Output file:	`output.txt`
Time limit:	1 second
Memory limit:	256 megabytes

Assistants want to know all of you, but they cannot remember everybody. So they decided to say hi to each of you. You are given an input string `name`, your task is to display `Hi, name` in the "output.txt"file.

Input

You are given string `name`.

Output

Display `Hi, name` in the file "output.txt".

Example

standard input	output.txt
Elvina	Hi, Elvina

Problem D. Free cabinet

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Askar Dzhumadildaev wants to find a cabinet for midterm exam. However, he remembers how it was difficult to find cabinet that will be empty at the given day (once, he had to postpone midterm until 14-th week!). So he asked you to collect the data about cabinets that will be busy on the midterm day. Knowing the range of numbers of cabinets in the KBTU and busy cabinets, you should provide the sorted list of free cabinets to the professor.

Input

The first line of input contains two integers f and l ($1 \leq f < l \leq 5000$) - the number of first and the last cabinet in the KBTU. The next line contains space separated numbers of busy cabinets.

Output

You should print numbers of free cabinets in sorted order. Separate numbers by space.

Examples

standard input	standard output
1 10 3 4 1 7 9	2 5 6 8 10
4 6 4 6	5

Problem E. Height checker

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

The semester is over, so assistants asked students to stand in non-decreasing order of heights to take a photo. Your task is to find the minimum number of students that must move in order for all students to be standing in non-decreasing order of height. Notice that when a group of students is selected they can reorder in any possible way between themselves and the non selected students remain on their seats.

Input

You are given an integer array.

Output

Print the minimum number of students that must move.

Examples

standard input	standard output
1 1 4 2 1 3	3
5 1 2 3 4	5

Note

In the first example, current array : [1, 1, 4, 2, 1, 3]. Target array : [1, 1, 1, 2, 3, 4] On index 2 (starting from 0) we have 4 vs 1 so we have to move this student. On index 4 we have 1 vs 3 so we have to move this student. On index 5 we have 3 vs 4 so we have to move this student.

Problem F. Number of good pairs

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Assistants have to pair students for the project and say the number of good pairs to the teacher. You are given an integer array `students`. A pair `(i,j)` is called good if `students[i] == students[j]` and `i < j`. Help your assistants find the number of good pairs of students.

Input

You are given an integer array.

Output

Print the number of good pairs of students.

Examples

standard input	standard output
1 2 3 1 1 3	4
1 1 1 1	6
1 2 3	0

Problem G. Damira and requisites

Input file:	standard input
Output file:	standard output
Time limit:	2 seconds
Memory limit:	256 megabytes

Damira wants to stage a scene in the theater. To do this, she needs requisites, in large quantities. She asked the members of the theater club to bring the items. But it is difficult to bring everything at once, so some people brought the items several times. We need to find out who brought what, in general.

Input

First line - number of iterations Next lines: Name of member, and his items

Output

In insertion order, name of member, and his items. Check format in output examples

Examples

standard input	standard output
4 Damira Chair Scarf Spoon Alexey Something Fork Bottle Damira Pillow Towel Mark Drinks Cakes Shoes	Damira: Chair, Scarf, Spoon, Pillow, Towel Alexey: Something, Fork, Bottle Mark: Drinks, Cakes, Shoes
4 Brian Item1 Item2 Item3 Brian Item4 Christian SomethingCool Brian Item5 Item6	Brian: Item1, Item2, Item3, Item4, Item5, Item6 Christian: SomethingCool

Problem H. Ivan and Data Science

Input file:	standard input
Output file:	standard output
Time limit:	2 seconds
Memory limit:	256 megabytes

Data analyst Ivan wants to check the certain text. He needs to find out how many chars there for each word in the lines, and how many chars there are in total for the whole line. Help him with this task.

Input

The First line contains N – the number of strings. Next N lines contain given strings.

Output

In ascending order, the number of chars in words for each line, and the total number of chars.

Examples

standard input	standard output
4 Can you hear the silence? Can you see the dark? Can you fix the broken? Can you feel, can you feel my heart?	3 3 3 4 8 total: 21 3 3 3 3 5 total: 17 3 3 3 3 7 total: 19 2 3 3 3 3 4 5 6 total: 29
4 oshiete oshiete yo sono shikumi wo boku no naka ni dareka iru no? kowareta kowareta yo kono sekai de kimi ga warau nanimo miezu ni	2 2 4 7 7 7 total: 29 2 2 3 3 4 4 6 total: 24 2 2 4 5 8 8 total: 29 2 2 4 5 5 6 total: 24

Problem I. Random pair generator

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

You're testing a random generator of unordered pair of numbers (so consider $(1, 2)$ same as $(2, 1)$). When the generator generates some pair of numbers, you have to answer how many times this pair was repeated previously by the machine.

Input

The first line of input contains one integer n ($1 \le n \le 10^5$). The next n lines contains two numbers a, b ($-10^9 \le a, b \le 10^9$), elements of an unordered pair that were generated.

Output

For each pair of numbers you should print how many times it was occurred before in separate line.

Examples

standard input	standard output
4 1 1 2 3 4 5 6 7	0 0 0 0
5 1 0 0 1 2 7 8 8 2 8	0 1 0 0 0

Problem J. Successful String

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

In the given string check is it successful or not. The string is successful if its first word is `PP2` and the last word is `midterm`. If the string is successful print `Success`, otherwise print `No`. The string can be lowercase or uppercase.

Input

The only line of input contains a string.

Output

Print "Success"if it successful, otherwise print "No"

Examples

standard input	standard output
PP2, good luck on the midterm	Success
PP2 hard midka	No
PP2 good midterm	Success

Note

You need to use RegEx in this problem.

Problem K. Symmetric difference

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

You are given two sets of numbers. Print their symmetric difference. Symmetric difference is the set of elements which are in either of the sets, but not in their intersection. For example, the symmetric difference of the sets $\{1, 2, 3\}$ and $\{3, 4\}$ is $\{1, 2, 4\}$.

Input

First line contains elements of set $S1$ ($1 \leq |S1| \leq 1000$). The next line contains elements of set $S2$ ($1 \leq |S2| \leq 1000$).

Output

Print elements of symmetric difference of sets $S1$ and $S2$ in sorted order.

Examples

standard input	standard output
1 2 3 4 5 6 4 5 6 7 8 9	1 2 3 7 8 9
1 2 3 4 6 6 4 2 3 1	
1 10 92 1 2	2 10 92

Problem L. Sum of special numbers

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Elvina wants to find the sum of special elements in the given array. But she forgot that element is special if and only if it appears only once in the array. Help Elvina to find the sum of all unique elements in the array.

Input

You are given an integer array.

Output

Print the integer number - sum of all unique elements in the array.

Examples

standard input	standard output
1 2 3 2	4
1 1 1 1 1	0
1 2 3 4 5	15