



8th QMUL S&E Programming Competition

Run by

School of Electronic Engineering and Computer Science

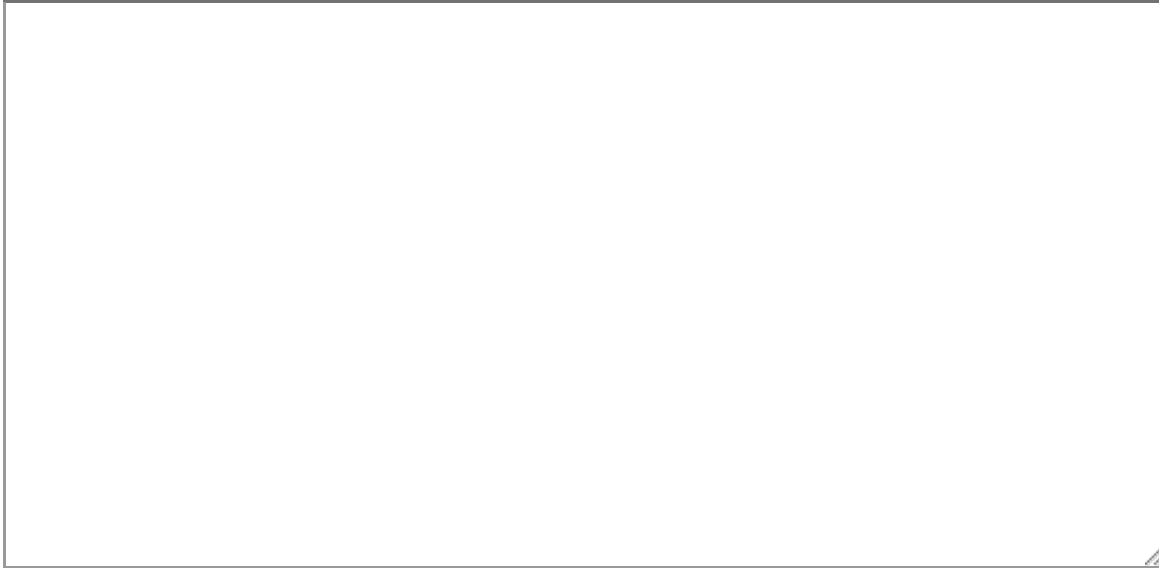
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Wednesday, 4th February 2015

Note. *Your programs should read from standard input. The programs should process one input and print the result at the standard output. When judging your submission we will run your program several times on different inputs.*

You did not try to solve this problem yet.
You have 1 hour and 15 minutes until the deadline.



Language:

In various social networks (such as Twitter) one can choose to "follow" other users. If user X is following user Y (we say that Y is an "idol" of X) it means that all the postings of Y are shown on X 's main page.

The network has figured out that a great way to make "idol" suggestions is to look at the list of idols of your idols who are not yet your own idols.

For instance, if John is following Sarah, and Sarah is following Peter, but John is not yet following Peter, he probably should. In other words, if Peter is Sarah's idol, and Sarah is John's idol, than it's quite likely that John will also consider Peter an idol.

Your job is to write a program that reads in a number k of people, together with the list of their idols, and a particular person X , and then prints all the potential idols of X , i.e. all idols of idols of X that are not yet idols of X .

Input Specification

Each input consists of:

- One line containing a number k ($1 \leq k \leq 50$).
- Then k lines specifying the name of k users with their corresponding non-empty list of idols. Each person will be given by a first and last name, in the format shown in the sample input. First and last names will consist of at most 25 alpha characters each.
- The name of a user X (one of the k listed) for whom we look to make idol suggestions.

If an idol does not appear in the list of the k users you can assume that this user has no idol's of their own. For instance, in the first example below "Silvia Berardi" is a user with an empty list of idols.

Output Specification

For each input, print the list of idols of idols of X who are not yet idols of X . Note that X cannot be their own idol. If this list is empty you should print "Nobody", as in the second sample input.

The list of idol recommendations should be given in lexicographic order. Initially, lexicographically order the list by first name. If there are users with the same first name then lexicographically order

these by their second name.

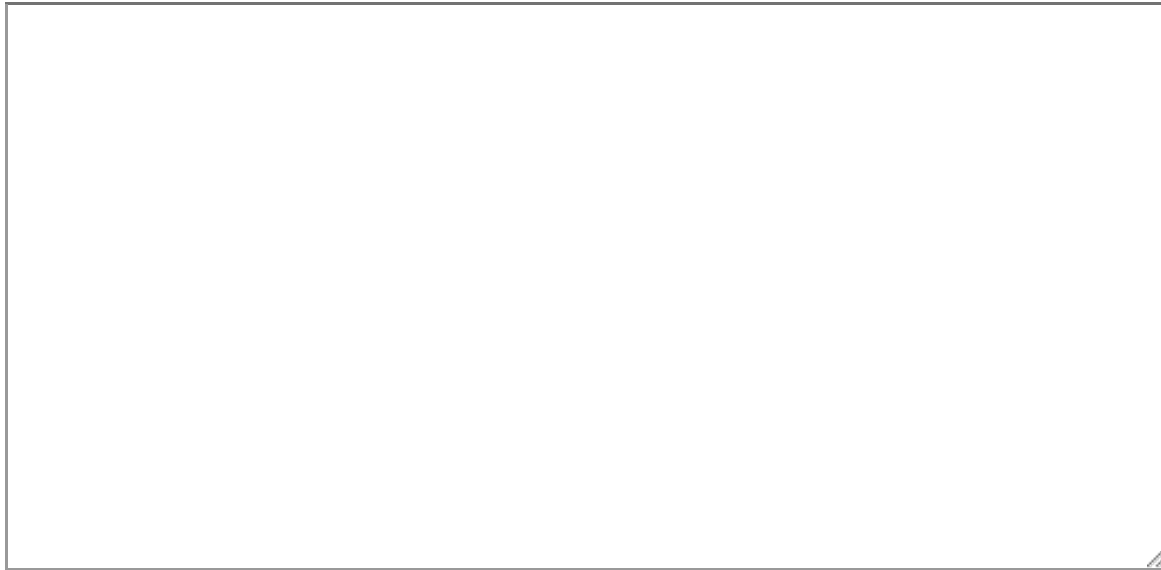
Sample Inputs.

Input	Output
4 Paul McDonald [Eva Clegg, Tony Blair, Nick Clegg] Eva Clegg [Tony Hedges, Silvia Berardi] Nick Clegg [David Cameron, Silvia Berardi, Paul McDonald] Tony Hedges [Eva Clegg, David Cameron, Nick Clegg] Eva Clegg	David Cameron Nick Clegg
3 Paul Harrold [Stefan Dantchev, Soren Riis] Stefan Dantchev [Soren Riis] Soren Riis [Paul Harrold, Stefan Dantchev] Paul Harrold	Nobody

Logout

You did not try to solve this problem yet.

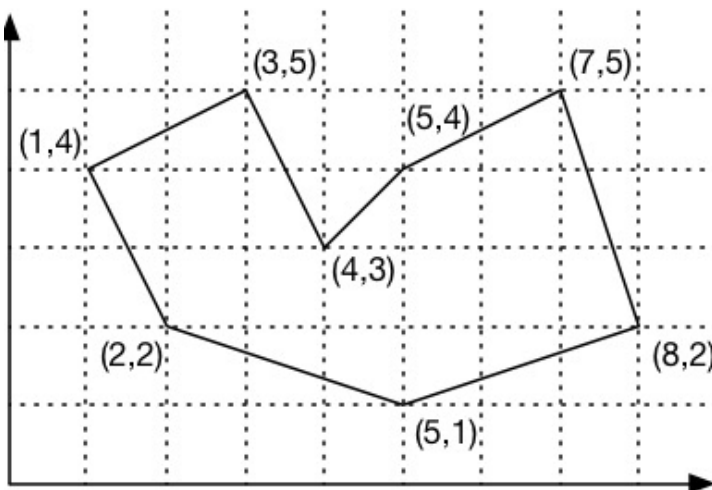
You have 1 hour and 14 minutes until the deadline.



Language:

A good friend of yours has come to you with an interesting problem. While most farms have a nice rectangular shape, his farm has a weird shape. The problem is that, for tax purposes, he needs to calculate its precise total area. He placed the land on a Cartesian plane, and calculated the coordinates of each point where two straight fences meet.

Knowing you are a very good programmer, he came to you with the list of coordinates, listed clockwise, and asked you to write a program that calculates the internal area of the farm. Obviously, farm lands are *simple polygons*, like in the sample image below (i.e. cows can roam free to any part of the farm without crossing a fence).



Input

Each input will be given as follows. The first line of the input contains a single positive integer $3 \leq n \leq 1,000$ containing the number of corners. Then n lines follow giving the coordinates of these corners listed clockwise (starting from an arbitrary corner) in the format shown in the sample input below. Each coordinate is a pair of non-negative integers.

Output

For each input, output the internal area of the piece of land (with exactly one decimal point).

Sample Inputs.

Input	Output
8 (3,5) (4,3) (5,4) (7,5) (8,2) (5,1) (2,2) (1,4)	17.0
3 (0,0) (1,1) (1,0)	0.5

Logout

You did not try to solve this problem yet.
 You have 1 hour and 9 minutes until the deadline.

Language:

Professor Kingsley observed that the frequency of the k th most common word in a text is roughly proportional to $1/k$. While Kingsley's rationale has largely been discredited, the principle still holds, and others have afforded it a more sound mathematical basis.

You have been asked to write a program that finds all the words occurring n times in a given English text. A word is a sequence of letters. Words are separated by non-letters. Capitalization should be ignored. A word can be of any length that an English word can be. Words that use hyphen, such as "long-term", and words that use apostrophe, such as "it's", should be considered as one word.

Input

The first line of the input contains a single positive integer n . Several lines of text follow which will contain no more than 10000 words. The text is terminated by a single line containing EndOfText. EndOfText does not appear elsewhere in the input and is not considered a word.

Output

For each input, output the words which occur n times in the input text, one word per line, lower case, in alphabetical order. If there are no such words in the input, your program should output the following line:

There is no such word

Sample Inputs.

Input	Output
<pre>2 In practice, the difference between theory and practice is always greater than the difference between theory and practice in theory. - Anonymous Man will occasionally stumble over the truth, but most of the time he will pick himself up and continue on. - W. S. L. Churchill EndOfText</pre>	<pre>between difference in will</pre>

2

"He's going to spoil everything!", said the little girl to her mum. "No he won't my darling", she replied. "He's just being silly." "That's easy for you to say, he won't do that to you, you are a grown-up". "Well, when day you will be a grown-up too you know. Go to bed now"
EndOfText

a
he
he's
won't

Logout

Developed by [Radu Grigore](#).

You did not try to solve this problem yet.
You have 1 hour and 14 minutes until the deadline.

Language:

A number whose only prime factors are 2,3,5 or 7 is called a *decent* number. The sequence (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 24, 25, 27) shows the first 20 decent numbers.

Write a program to find and print the n th element in this sequence.

Input Specification

The input consists of a single number n with $1 \leq n \leq 1000$.

Output Specification

For each input, print one line saying "The n th decent number is $\langle number \rangle$ ". Depending on the value of n , the correct suffix "st", "nd", "rd", or "th" for the ordinal number n th has to be used like it is shown in the sample outputs.

Sample Inputs.

Input	Output
1	The 1st decent number is 1
11	The 11th decent number is 12
100	The 100th decent number is 450

You did not try to solve this problem yet.
You have 1 hour and 14 minutes until the deadline.

Language:

We are all so proud. Everyone knew that my father had been an very good bridge player for decades, but when it was announced that he would be in the Guinnesses Book of Records as the most successful bridge player ever, wow, that is amazing!

The Bridge Association for the Elderly has maintained, for several years, a weekly ranking of top 5 players (identified by their codes) in the world. Considering that each appearance in a weekly ranking constitutes a point for the player, dad was nominated the best player ever because he got the highest number of points.

Your job is to write a program that discovers (from the list of weekly rankings) my dad's code, i.e. the code that appears more often (this will be guaranteed to be unique in all test inputs).

Input Specification

The input consists of a number $1 \leq k \leq 1,000$ of weeks, followed by k lines each containing 5 numbers (the id of the top 5 players of that week).

Output Specification

For the given input, print dad's id (i.e. the id of the player that appears more often than any other player) and the number of weeks in which he was among the top five, in the format

id appears n times

The competition is setup so that it is guaranteed that there is a unique id which appears the most number of times.

Sample Inputs.

Input	Output
6 20 33 25 32 99 32 86 99 25 10 42 93 99 95 11	99 appears 5 times

29 99 10 33 86
21 64 28 98 18
19 33 74 99 32

10
20 33 25 32 28
32 86 28 25 10
42 93 28 95 11
29 28 10 33 86
21 64 28 98 18
19 33 74 28 32
20 33 25 32 28
32 86 27 25 10
42 93 28 95 11
29 28 10 33 86

28 appears 9 times

Logout

You did not try to solve this problem yet.
 You have 1 hour and 14 minutes until the deadline.

Language:

In the German Lotto you have to select 6 numbers from the set $\{1, 2, \dots, 49\}$.

A popular strategy to play Lotto - although it doesn't increase your chance of winning - is to select a subset S containing k ($k > 6$) of these 49 numbers, and then play several games with choosing numbers only from S .

For example, for $k=8$ and the set $S = \{1, 2, 3, 5, 8, 13, 21, 34\}$ there are 28 possible games: $[1, 2, 3, 5, 8, 13]$, $[1, 2, 3, 5, 8, 21]$, $[1, 2, 3, 5, 8, 34]$, $[1, 2, 3, 5, 13, 21]$, ..., $[3, 5, 8, 13, 21, 34]$.

Your job is to write a program that reads in the number k and the set S and then prints all possible games choosing numbers only from S .

Input Specification

Each input consists of one line containing several integers separated from each other by spaces. The first integer on the line will be the number k ($6 < k \leq 16$). Then k integers, specifying the set S , will follow in ascending order.

Output Specification

For each input, print all possible games that can be played using only numbers in the given set S , each game on a separate line.

The numbers of each game have to be sorted in ascending order and separated from each other by exactly one space. The games themselves have to be sorted lexicographically, that means sorted by the lowest number first, then by the second lowest and so on, as demonstrated in the sample outputs below.

Sample Inputs.

Input	Output
	1 2 3 4 5 6
	1 2 3 4 5 7
	1 2 3 4 6 7

7 1 2 3 4 5 6 7

1 2 3 5 6 7
1 2 4 5 6 7
1 3 4 5 6 7
2 3 4 5 6 7

8 1 2 3 5 8 13 21 34

1 2 3 5 8 13
1 2 3 5 8 21
1 2 3 5 8 34
1 2 3 5 13 21
1 2 3 5 13 34
1 2 3 5 21 34
1 2 3 8 13 21
1 2 3 8 13 34
1 2 3 8 21 34
1 2 3 13 21 34
1 2 5 8 13 21
1 2 5 8 13 34
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1 2 8 13 21 34
1 3 5 8 13 21
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1 3 5 13 21 34
1 3 8 13 21 34
1 5 8 13 21 34
2 3 5 8 13 21
2 3 5 8 13 34
2 3 5 8 21 34
2 3 5 13 21 34
2 3 8 13 21 34
2 5 8 13 21 34
3 5 8 13 21 34

Logout