Universidad Católica Boliviana

Facultad de Ciencias Exactas e Ingeniería

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CONTEST SESSION

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Problem A
DBMS

Arthur Benjamin is in your class, he will write a "Double Birthday Magic Square" on the blackboard, but you are more fast in programming than he is in writing and you want to proof it giving the answer before him.

A "Double Birthday Magic Square" is made of a birthday date, for example your best friend's birthday is February 2 of 1989, it split in four numbers 2, 2, 8 and 9 ignoring 19 in the year, then you put this numbers in the first row of a grid composed by 4×4 cells, if you add this numbers you get $2+2+8+9$ equals 21 and this is the magic number. Notice than the sum of each row is 21, the sum of each column is also 21 and diagonals as well, and look at the corners and others cells.

2	2	8	9	21
7	10	1	3	21
10	9	1	1	21
2	0	11	8	21
21	21	21	21	21

In other words you have a = month, b = day, c = third digit of the year, d = fourth digit of the year and $a+b+c+d$ = magic number. You have notice than Arthur always put b in a corner and $c+1$ like the next grid.

a	b	c	d
?	?	?	?
?	$c+1$	?	?
b	?	?	?

Input

The input contains several test cases, each one described in a single line. The line contains three integers M, D and Y separated by a single space, representing the month, day and year respectively ($2 \leq M \leq 12$), ($2 \leq D \leq 31$) and ($1922 \leq Y \leq 1999$). The last line of the input contains EOF End of Line and should not be processed as a test case.

Output

For each test case print the "Double Birthday Magic Square" each cell separated by a single space. If there are multiple solutions output any.

Sample input	**Output for sample input**
2 2 1989 11 12 1988	2 2 8 9 7 10 1 3 10 9 1 1 2 0 11 8 11 12 8 8 7 9 10 13 9 9 11 10 12 9 10 8

Problem B
MiniMax

Given a natural number with four digits, all digist are not necesary the same, find the greater and smaller number than you can form with these digits.

For example if you have 6174 the greater number is 7641 and the smaller is 1467.

Input

The input contains several test cases, each one described in a single line. The line contains an integer N ($1000 \leq N \leq 9999$). The last line of the input contains a single 0 and should not be processed as a test case.

Output

For each test case output a single line with two integers A and B separated by a single space such that A is the greater number and B is the smaller number.

Sample input	**Output for sample input**
6174 1000 0	7641 1467 1000 1

Problem C
The Fraction Game

Alice and Bob are playing a game, each one will write on a paper an agreed quantity of fractions in only five seconds, the winner is the person than wrote more irreducible fractions. For example the number of fractions is three and Alice have: $\frac{1}{12}$, $\frac{7}{12}$ and $\frac{3}{12}$, Bob have: $\frac{3}{7}$, $\frac{2}{8}$ and $\frac{10}{5}$. The winner is Alice because she have two irreducible fractions $\frac{1}{12}$ and $\frac{7}{12}$ and Bob have only one $\frac{3}{7}$.

They are not good with math and the time is very short for think, help them for decide the winner.

Input

The input contains several test cases, each one described in three lines. The first line contains an integer N indicating the number of fractions than Alice and Bob wrote ($1 \leq N \leq 100$). The second line contains N fractions X_i separated by single spaces with a numerator n_i and denominator d_i, representing the Alice's fractions n_i/d_i ($1 \leq n_i, d_i \leq 100$ for $1 \leq i \leq N$). The third line contains N fractions Y_i separated by single spaces, representing the Bob's fractions ($1 \leq Y_i \leq 100$ for $1 \leq i \leq N$).

The last line of the input contains the number 0 and should not be processed as a test case.

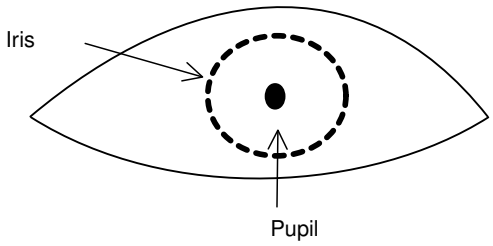
Output

For each test case output a single line containing an string "`Alice`" if the Alice is the winner, or an string "`Bob`" otherwise, in case of tie output "`=`".

Sample input	**Output for sample input**
3 1/12 7/12 3/12 3/7 2/8 10/5 5 2/4 6/3 8/2 1/3 15/3 3/5 9/11 4/2 56/4 33/3 1 7/2 4/5 0	Alice Bob =

Problem D
Eye Tracking

The eye is a part of human body litle estimate by a lot people, but it is used for research in human computer interaction, a software track the eye movements for determine where the user is looking at the computer screen and the mouse cursor place there. The UCB researchers are building a prototipe than will be operate by people with Amyotrophic Lateral Sclerosis, they can not move almost none muscle of the body only the eye muscles.



For determine the position in where place the mouse cursor, the researchers need the center of a convex polygon formed by points than encircle the pupil insted of find the points of the iris because sametimes same parts are hidden. Now you are part of this research group and they give you a task, given a set of point your work is find the convex hull to form the polygon and then find the center point.

Input

The input contains several test cases, each one described in several lines. Each test case consists of an integer N ($3 \leq N \leq 100$) in a single line, indicating the number of points collected in the pupil border. Following, there are N lines, each containing two integers X, Y ($0 \leq X, Y \leq 10000$) corresponding to the coordinates of each point. The last line of the input contains EOF End of File and should not be processed as a test case.

Output

For each test case output the points of the convex hull each one in a single line with X and Y separeted by single space in counter clockwise order. The last line of the output is the center point of the convex hull, remember than this point is equivalent to the centroid (center of mass), enclosed with () like (X Y). All the points with three decimal digits.

Sample input	**Output for sample input**
9 200 400 300 390 300 300 400 300 400 370 500 400 500 200 350 250 200 200 3 0 0 0 3000 4000 0	200.000 200.000 500.000 200.000 500.000 400.000 200.000 400.000 200.000 200.000 (350.000 300.000) 0.000 0.000 4000.000 0.000 0.000 3000.000 0.000 0.000 (1333.333 1000.000)

Problem E
Felix Cat

The Felix Cat is proud because he say than he can build 1000 bricks with only his hands in less than a week, but a lot people are sceptical with this affirmation and they hire you for refute or corroborate it and prevent than others say the same in the future.

Input

The input contains several test cases, each one described in one line. The line contains two integers N and A separated by a single space, representing the number of bricks in a week and the average in minutes for build two bricks, respectively ($1 \leq N \leq 1000$) ($1 \leq A \leq 60$). The last line of the input contains the number 0 twice separated by a single space and should not be processed as a test case.

Output

For each test case output a single line containing an uppercase "`Y`" if the affirmation is true, or an uppercase "`N`" otherwise.

Consider a week with 40 work hours.

Sample input	**Output for sample input**

`1000 60`
`80 60`
`70 60`
`0 0`
	`N`
	`Y`
	`Y`

Problem F
Before sum, multiplication now

The teacher J.G. Büttner tried to occupy pupils by making them add the numbers from 1 to 100, but Gauss solved this problem very quickly. Now your teacher is doing the same with you using another kind of operation.

Given two very large numbers with the same and even quantity of digits, multiply them.

Input

The input contains several test cases, each one described in two lines. The first line contains one integers A, the second line contains another interger B ($10 \leq A, B \leq 2^{10000}$). The last line of the input contains EOF End of File and should not be processed as a test case.

Output

For each test case output a single line containing the result of $A * B$.

Sample input	**Output for sample input**
10 80 70 19876454	800 1391351780

Problem G
Bomb in the door

You're in a castle that can be represented by a grid of 10×10 cells, you must escape before a bomb explodes in the one exit door, but before you must to pick up the key.

You can only move up, down, left and right in the cells represented by "`o`", walls are represented by "`x`", you're represented by "`m`", key is represented by "`k`" and the exit by "`e`".

Which is the minimum number of movements that you need for to be out?

Input

The input contains several test cases, each one described in ten lines. The lines can contain "`o`", "`x`", "`m`", "`k`" and "`e`" explained above. The last line of the input contains EOF End of File and should not be processed as a test case.

Output

For each test case output a single line containing an integer with the minimum number of movements for to be out.

Sample input	Output for sample input
xxxxxxxxxx xmooxxxxxx xooooooox xxooxxxxxx xookxxxxxx xoooxxxxxx xxxooxxxxx xxxoooxxxx xxxooooooe xxxxxxxxxx xxxxxxxxxx xxxxxxxxxx xxxxxxxxxx xooooooox xooomooox xooooooox xxxokoooxx xxxooooooe xxxooooox xxxxxxxxxx	15 8

Problem H
Prime Queue

You are in the middle of a queue to buy tickets for the rock concert, but there are many people, yesterday the organizers handed out numbers to avoid fraud, today they decided to sell the tickets to people who are in the middle of prime numbers for example if you have the number 4 and the people who have the numbers 3 and 5 are present you will buy the tickets, but if the number 5 is not present and you're in the middle of 3 and 6 they do not sell you the tickets because 6 is not a prime number.

Input

The input contains several test cases, each one described in three lines. The first line contains an integers N indicating the number of people in the queue ($3 \leq N \leq 100000$). The second line contains N ordered or unordered integers X_i separated by single spaces, representing the the number of each person ($1 \leq X_i \leq 100000$ for $1 \leq i \leq N$). The third line contains your number Q ($1 \leq Q \leq 100000$). You're always in the middle of two people. The last line of the input contains EOF End of File and should not be processed as a test case.

Output

For each test case output a single line containing an uppercase "`Y`" if you will buy the tickets, or an uppercase "`N`" otherwise.

Sample input	**Output for sample input**
5 1 2 4 3 5 4 6 4 2 9 7 3 6 4 3 5 7 2 5	Y N Y