CODEFORCES β
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acmASCIS Contest#5

A. The Vendor

time limit per test: 0.25 seconds
memory limit per test: 64 megabytes
input: standard input
output: standard output

3am Hassan is a moving vendor. He sells spud for living.

3am Hassan has a neat way of distributing his cargo to keep track of his spuds. Suppose that he has N boxes and M spuds. 3am Hassan can go to work with an eased mind if the M spuds can be equally divided into the N boxes without leaving any empty boxes or any spud without a box. In other words, 3am Hassan can only go to work if each box of the N boxes contains an x number of spuds, where $x * N = M$. Can you help 3am Hassan decide if he can go to work or not?

Input
The input consists of one line with two integers N and M ($1 \le N, M \le 2^{64} - 1$), which denote the number of boxes 3am Hassan has and the number of spuds he possesses, respectively.

Output
If 3am Hassan can go to work without a problem, print "Yes". If not, print "No".

Sample test(s)

input
5 35
output
Yes

input
45 3
output
No

Note
Note that each and every spud must be put in one of the boxes.

B. 54% Completed

time limit per test: 1 second
memory limit per test: 64 megabytes
input: standard input
output: standard output

Progress bars, progress bars, progress bars. Don't you hate them? When you see a progress bar you feel like: "Oh no! I'll have to wait for another bar to be completed!". So, we decided to make them a little bit interesting. Instead of displaying the progress bar for you, the page you're visiting will provide you with some information, and then it will ask you to draw the bar yourself. So let's have fun and draw some progress bars!

The page will tell you that the progress bar is divided into n equal-sized parts, and that each part needs $k\%$ to be fully filled, where $k * n = 100$.

Input

The page will provide you with 3 numbers n, k, t ($1 \le n, k \le 100$, $0 \le t \le 100$), where the page has loaded $t\%$ at the time it gave you this information.

Output

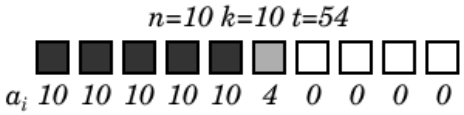
Print n numbers, where a_i is the saturation level of the i^{th} part of the progress bar (where the i^{th} part is $[a_i / k * 100]\%$ full).

Sample test(s)

input
10 10 54
output
10 10 10 10 10 4 0 0 0 0

Note

This is the drawing of the sample case:



C. Penguins of Madagascar

time limit per test: 2 seconds
memory limit per test: 64 megabytes
input: standard input
output: standard output

In a remote island, a flock of penguins live. Their King decided to marry his pretty girl to an intelligent penguin. The King didn't know which penguin to choose. Suddenly he got an idea, he decided to hold a competition and the “intelligent” penguin who will be the best competitor, will marry the king's daughter.

The game was as follows:

Each penguin that applied for the competition will enter a maze divided into cells. Each starting cell has a random positive number S_0, the next cell will be the sum of the squares of the digits of S_0, and is represented by S_1. In a similar way, let the sum of the squares of the digits of S_1 be represented by S_2 and so on. The goal of the game is to reach the cell with the number 1 on it. In other words, if a penguin reaches a cell where S_i = 1 (where 1 ≤ i), then the penguin wins the game and is considered an "intelligent" penguin.

For example, the penguin whose path starts with a cell with the number 7 will be an intelligent penguin since 7 -> 49 -> 97 -> 130 -> 10 -> 1 , and the one that starts with 4 will be a stupid penguin since 4 -> 16 -> 37 -> 58 -> 89 -> 145 -> 42 -> 20 -> 4.

This means that the intelligence of any penguin depends on choosing the right starting cell. Your task is to help the participating penguins decide if the starting cell number will lead him to be an "Intelligent Penguin" or not.

Input

The first line of input consists of the number t, which represents the number of test cases (1 ≤ t ≤ 50). Then t lines follow, the i^{th} consists of a number n, which represents the starting cell of the i^{th} penguin (1 ≤ n ≤ 1000).

Output

Print t lines. In the i^{th} line print "Intelligent" if the i^{th} penguin chose wisely. Else, print "Stupid".

Sample test(s)

input
3 7 4 13
output
Intelligent Stupid Intelligent

D. Range Queries Problem

time limit per test: 2 seconds
memory limit per test: 64 megabytes
input: standard input
output: standard output

One of my favorite problems is range query problems. Range query problems are problems in which you are given a large array and a certain number of queries, where each query consists of two integers, x and y, and you have to find the maximum, minimum, sum, or product of the interval $[x, y]$. Usually that array is so large that you have to use certain structures, which I think is the coolest ever; one is called Segment Tree, and the other is called Binary Indexed Tree. But, because you're yet to meet these structures in the senior training, this is a simplified version of that problem.

Input

You are given an integer N ($2 \le N \le 10000$), which represents the size of the array, then N integers follow. Then, you are given an integer Q ($1 \le Q \le 10000$), which represents the number of queries to be made, then Q lines follow, each line consisting of two integers x and y ($1 \le x,y \le N$).

Output

Output the maximum, minimum, and sum of the interval $[x, y]$ separated by spaces.

Sample test(s)

input
10 1 2 3 4 5 6 7 8 9 10 5 1 10 2 10 5 10 2 9 3 8
output
10 1 55 10 2 54 10 5 45 9 2 44 8 3 33

E. Afifi's Will II

time limit per test: 0.25 seconds
memory limit per test: 4 megabytes
input: standard input
output: standard output

After you wrote the program to open the safe, you found Afifi's will inside it saying:

"My dear family,

This is Afifi, writing to you his will...

You may have found it difficult to open the safe, but I wanted to make sure that one of you can become a great programmer. However, I also want to make sure that this person can be a great mathematician too, so that he/she can benefit humankind with his/her science. That's why I put my final will inside a bank safe that can't be opened without using Mathematics. This time the safe is a digital one. Its password consists of one integer that is the result of the function:

$$\sum_{i=1}^{i=n}(2n-1)$$

I hope you succeed in opening the safe and getting my wealth.

Yours, Afifi..."

Since you were the one who opened the first safe, you must write a program that generates the password of the second safe to be able to open it too. Remember not to disappoint your grandpa, Afifi, and your family.

Input
The input consists of one integer n ($1 \le n \le 10^9$).

Output
Print a line that consists of the safe's password (the result of the function).

Sample test(s)

input
1
output
1

input
737
output
543169

F. Leyland Number

time limit per test: 2 seconds
memory limit per test: 64 megabytes
input: standard input
output: standard output

In number theory, a Leyland number is a number of the form $x^y + y^x$ where x and y are integers greater than 1 and $x \le y$. They are named after the mathematician Paul Leyland.

Your task is to find out whether a number is a Leyland number or not.

Input
You are given a number N ($1 \le N \le 10^9$)

Output
Print "YES" if the number is a Leyland number then print x and y on the next line, otherwise, print "NO".

Sample test(s)

input
8
output
YES 2 2

input
54
output
YES 3 3

input
13
output
NO

G. Simplification

time limit per test: 1 second
memory limit per test: 64 megabytes
input: standard input
output: standard output

"Simplify the following fraction to the simplest form". We have all seen this sentence in our mathematics tests before. Your task here is not different at all. You are given a fraction and you have to provide us with its simplest form to pass to the next level.

Input

The first line of input contains one number t, which represents the number of test cases ($1 \le t \le 300$). t lines follow, and in each line you're given a fraction to simplify ($1 \le numerator, denominator \le 10^6$).

Output

Print t lines, in which the i^{th} line represents the simplest form of the i^{th} fraction ($1 \le i \le t$).

Sample test(s)

input
2 4/6 3/1
output
2/3 3

Note

Note that the simplest form for c/1 is c (see the second example case).

H. Quest for bananas!

time limit per test: 1 second
memory limit per test: 64 megabytes
input: standard input
output: standard output

A group of scientifically enhanced monkeys are tested in an experiment. There is a password protected door and behind it is the monkeys' dream: bananas! The door password consists of n unique characters. The door security machine can give the monkeys hints in the form of a password string containing some characters to help them get the password faster. For example, “1**”. The monkeys try a new password every hour. What is the maximum number of hours the monkeys have, to keep trying new passwords, before they can open the door?

Input

The first line of input will be a single integer n, which is the length of the password ($1 \le n \le 20$). The second line contains n characters (the password), in which each character can be an asterisk (‘*’) representing an unknown character, or it can be a reserved character which can be a single digit (‘0’...’9’) or a capital alphabetic character (‘A’...’J’).

Output

Print one number representing the maximum number of passwords that can be entered by the monkeys into the machine before getting the bananas.

Sample test(s)

input
5 1***7
output
4896

input
4 G**9
output
306

input
9 D2******8
output
8910720

I. Stern-Brocot Numbers

time limit per test: 2 seconds
memory limit per test: 64 megabytes
input: standard input
output: standard output

Stern-Brocot sequence is a sequence of numbers that goes like this:

1- You start with {1, 1}.

2- You pick the first two numbers (x, y) and add their summation to the end of the sequence.

3- You add the second number (y) to the end of the sequence.

4- You then pick the next two numbers and do the same operations to them, and so on.

The first few numbers of Stern-Brocot sequence are: {1, 1, 2, 1, 3, 2, 3, 1, 4, 3}.

Input
You are given a number n ($1 \le n \le 10^6$).

Output
Print the n^{th} number of Stern-Brocot sequence.

Sample test(s)

input
3
output
2

input
10
output
3

J. ACM

time limit per test: 1 second
memory limit per test: 64 megabytes
input: standard input
output: standard output

An ACMer can not be a true ACMer until he knows the detailed history of the ACM and acmASCIS.

ACM, which stands for “Association for Computing Machinery”, is the world’s largest educational and scientific computing society. It delivers resources that advance computing as a science and a profession.

The ACM provides the computing field’s premier Digital Library and serves its members and the computing profession with leading-edge publications, conferences, and career resources.

The ACM Organization was established in 1947, with the establishment of the first computer program for digitally storing; and has many branches all over the world.

acmASCIS is Ain Shams University’s student chapter supported by ACM organization. It started on February 19th, 2002 and was given the name ASCIS. ASCIS stands for Ain Shams Computer and Information Science. acmASCIS is a nonprofit organization managed by a group of FCIS students from different academic years.

Being their main goal to spread knowledge, they are looking forward to a true revival for their community made by young computer scientists. acmASCIS organizes many events in order to achieve that goal (i.e. weekly trainings, conferences, contests, technical/non technical sessions, online weekly challenges, weekly scientific posts, etc...).

acmASCIS was founded by Wael Khalifa (president), Mohamed Fawzy Abd El Aziz(vice), and Mahmoud El Sayed. Back then, submissions were made on a floppy disk and the verdict was given on a floppy disk too. Can you imagine?

Then, in 2003/2004 Hussein Mahana was president; in 2004/2005 came Mohamed Abdelrahman and Abdullah Gamal (who became a TA for a while) and now both of them work in Microsoft; in 2005/2006 came Yasser Rehan; in 2006/2007 came Wael Elgayar, which is when they achieved the best rank for the chapter in the recent years when he came 4th in the Regionals along with Abdallah Gamal, Mostafa Elmasrawy and Haytham Alaa. In 2007/2008 came Alaa Shaker with Roaa Mohamed as his vice; in 2008/2009 Abdallah Hassan; in 2009/2010 Abdelrahman Elogeel; in 2010/2011 Muhamed Hesham; in 2011/2012 Amr Mahdi; in 2012/2013 Amr Ahmad Elroumy; in 2013/2014 Mohamed Gamal Soliman; and the current president is Mahmoud Mohamed Afifi and already the chapter has broken its previous record of the highest rank in the Regionals, which has been achieved by team TAU (Ahmed Mohsen Hassan, Mohamed Salama, and Ahmed Ameen) that received 3rd place and has qualified for the World Finals 2015 in Morocco.

Now that you know acmASCIS' history in detail, we can get to the problem. The problem is simple. Given two numbers A and B, output the sum of the two numbers.

Input
The input consists of two integers A and B ($1 \le A, B \le 100000$).

Output
Print one line containing the answer to the problem.

Sample test(s)

input
17 11
output
28

input
10007 31
output
10038