

acmASCIS Session 2**A. Playing With Numbers**

time limit per test: 1 second

memory limit per test: 64 megabytes

input: standard input

output: standard output

Ahmed has a problem in his first year of primary school. He can not write numbers.

So his teacher suggested that he write the numbers several times, under one condition: if the teacher says "7", then Ahmed will write this number 7 times.

Write a program that will help Ahmed in doing his task.

Input

The input consists of a single line containing one integer X ($1 \leq X \leq 10$).

Output

Print the number X , repeated X times. The numbers should be separated by one space.

Sample test(s)

input
7
output
7 7 7 7 7 7 7

input
6
output
6 6 6 6 6 6

B. Triangle

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

Mohamed has learned loops in the acmASCIS session and wants to print a triangle on the screen. Mohamed's triangle will consist of asterisks '*' only. Help him print the triangle.

Input

The input consists of one integer N ($1 \leq N \leq 100$).

Output

Print Mohamed's triangle using only asterisks.

Sample test(s)

input
3
output
* ** ***

input
6
output
* ** *** **** ***** *****

Note

- Look to sample tests for more details.

C. Digits Summation

time limit per test: 1 second

memory limit per test: 64 megabytes

input: standard input

output: standard output

Som3a and Omar challenged each other to a game. The game is, given a non-negative number X , they have to calculate the sum of the digits of X . The winner is the person who will say the sum first. Som3a wants to beat Omar, so he needs your help.

Input

The input consists of a number X ($X \leq 2^{63}$).

Output

Your program should print the summation of the digits of the number X .

Sample test(s)

input
3
output
3
input
121
output
4

D. Not a Mysterious Machine

time limit per test: 1 second

memory limit per test: 64 megabytes

input: standard input

output: standard output

Dr. Codenstein is at it again! Once again, Dr.Codenstein has invented a brilliant machine, but this time, he knows exactly what it does.

Dr.Codenstein is a big fan of Fibonacci, and he is obsessed with Fibonacci's sequence. Fibonacci's sequence is a sequence that defines its X th term as $F(X) = F(X-1) + F(X-2)$.

Given X , can you calculate the X th term?

Input

The input consists of a single integer X ($1 \leq X \leq 90$).

Output

Your program should output the X th term in the Fibonacci sequence.

Sample test(s)

input
1
output
1

input
4
output
3

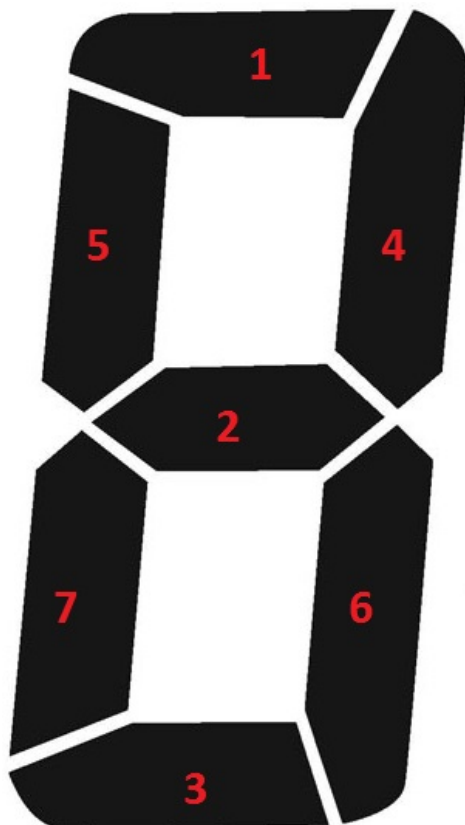
input
10
output
55

Note

Note that $F(1) = F(2) = 1$.

E. Digital Number

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



Mohamed has a LED-based, 7-segment display, which displays digits from 0 to 9. Each segment has a number (check the above picture).

You will be given an integer, where each digit in it represents a segment that will be displayed.

Input

The input consists of one integer N ($1 \leq N \leq 7654321$).

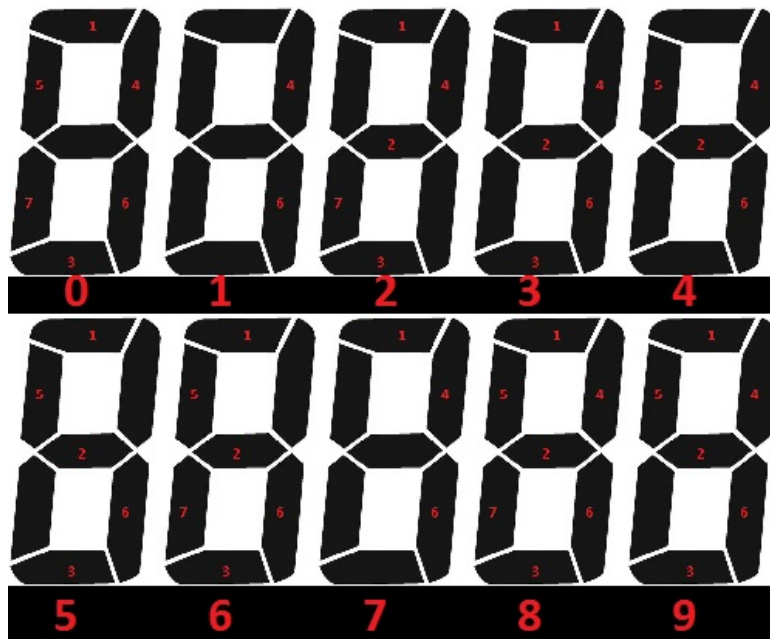
Output

Print the digit which will be created on the LED. If there is no solution to the problem, print -1 on a line.

Sample test(s)

input
145637
output
0
input
64
output
1

Note



F. SoundCloud

time limit per test: 1 second

memory limit per test: 64 megabytes

input: standard input

output: standard output

Kamal listens to music on SoundCloud alot, everywhere and at any time.

This annoys his friends. They say that he spends all his time listening to music and he quit doing anything else useful.

Kamal is bored from their advice to stop listening to music and decided to challenge them. If Kamal's friends win the challenge, Kamal will stop listening to music forever.

Kamal will start listening to his favorite playlist - which includes 20 songs, starting from song #1, but he made a mistake and told his friends that he will listen to N songs from the playlist (repetitions included).

Kamal's friends want to know the number of the last song Kamal listened to, after N Songs.

Help Kamal's friends win the challenge.

Input

The input consist of N, the number of songs Kamal will listen to ($1 \leq N \leq 1000$). Then N characters follow:

- '*' means Kamal is listening to the current song.
- '>' means Kamal skipped the current song and will listen to the next song.
- '<' means Kamal repeated the last song.

The first character of the N number of characters will be either '*' or '>'.

Output

Print the number (in the playlist) of the last song Kamal has listened to after N songs.

Sample test(s)

input
7 *****
output
7
input
6 *>*>*>
output
9

Note

- Kamal may play the playlist many times.

G. Factorial

time limit per test: 1 second

memory limit per test: 64 megabytes

input: standard input

output: standard output

Given a number N , compute its factorial $\text{Fact}(N)$.

Where $\text{Fact}(N) = N * (N-1) * (N-2) * \dots * 3 * 2 * 1$.

Input

The input consists of one integer N ($1 \leq N \leq 20$).

Output

Print the factorial of N .

Sample test(s)

input
3
output
6
input
5
output
120

H. Palindromic Numbers

time limit per test: 1 second

memory limit per test: 64 megabytes

input: standard input

output: standard output

Gamil is writing a letter to his Indian pen-pal, but he isn't sure if Indians read numbers from left to right or from right to left. Gamil wants to make sure that any number he writes is read the same from both sides, to avoid any misunderstanding. You have a list with all the numbers Gamil will write in his letter. Can you tell Gamil how many of the numbers he will write may cause a misunderstanding?

Input

The input consists of two lines, the first line consists of one integer N ($1 \leq N \leq 100$), which is the number of numbers you have on the list. The second line contains N numbers, separated by spaces, which are the numbers Gamil will write in his letter ($0 \leq A_i \leq 10^{12}$).

Output

Print one integer, which is how many numbers Gamil will write that may cause a misunderstanding.

Sample test(s)

input
3 121 1 35
output
1

I. Calculator Again!

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

Koko has attended the second session in acmASCIS level 1, and now he wants to make a more advanced calculator. His new calculator will do the same operations as the old one (addition, subtraction, multiplication and division of two integers), but it can also make multiple operations at a time, and it makes them in order.

Input

The input consists of a sequence of operations. Each operation consists of an integer X then symbol ('+' or '-' or '*' or '/', without the single quotes), then another integer Y ($0 < |X|, |Y| < 10^4$). The character '.' ends the sequence.

Output

For each operation in the sequence of operations, print the result of the calculation that was made by Koko's new calculator.

Sample test(s)

input
3+5*2.
output
16

input
12-2/2.
output
5

Note

- The sequence will contain at least one operation.
- For every operation except the first one, X represents the result of the previous operations.
- The division in this calculator is an integer division.
- The maximum number of operations in the sequence is 11.
- Make sure that the final result will be less than 2^{64} .

J. Jolly's Fibonacci

time limit per test: 1 second

memory limit per test: 64 megabytes

input: standard input

output: standard output

Jolly's math teacher gave her a task to calculate the Nth Fibonacci number. Can you help her?

Input

There are multiple test cases. The first line of input contains a single integer T denoting the number of test cases ($1 \leq T \leq 1000$). For each test case, there is a single line containing 3 integers (A, B, N), separated by a single space.

"A" represents the first number in the Fibonacci sequence (F_0) ($2 \leq A < 100$). "B" represents the second number in the Fibonacci sequence (F_1) ($2 \leq B < 100$). "N" represents the index of required Fibonacci number (F_i) ($N=i$) ($2 \leq N < 50$).

Output

For each test case, calculate and print the Nth Fibonacci number.

Sample test(s)

input
3 4 7 10 3 4 5 2 9 20
output
521 29 69247

Note

The Fibonacci sequence is (0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, ...), which is defined by the recurrence:

$$F_0 = 0$$

$$F_1 = 1$$

$$F_i = F_{i-1} + F_{i-2} \text{ for } i > 1$$

K. Find it!

time limit per test: 1 second

memory limit per test: 64 megabytes

input: standard input

output: standard output

Ayman loves math, he enjoys solving math problems. His brother, Ahmed, entered a challenge with him. Ahmed will give Ayman (N-1) unsorted numbers within the range (1 to N) and Ayman should find the missing number.

Your mission is to help Ayman win the challenge by writing a program that can find out the missing number.

For example, if N equals 6, then Ahmed will give Ayman 5 numbers: 1 3 5 2 6. Then the missing number will be 4.

Input

The input begins with one positive number N ($1 < N \leq 50$), followed by N-1 number of integers, where the i-th integer is in the range ($1 \leq i \leq N$).

Output

You should print a single positive integer, which is the missing number that doesn't exist in the given (N-1) numbers.

Sample test(s)

input
6 1 2 5 6 3
output
4

input
4 2 4 3
output
1

L. Koky and Moky

time limit per test: 1 second

memory limit per test: 64 megabytes

input: standard input

output: standard output

Our friends Koky and Moky were sitting in the garden. Bored as ever, they decided to play a game while they were sitting in front of the garden's door. The game is, given that the college has a total of X students, and Koky and Moky only know Y of them, if N of them enter the garden, what is the maximum number of people it is probable that they know?

Input

The input consists of three integers X , Y ($1 \leq Y \leq X \leq 10^9$), Q ($1 \leq Q \leq 100$), which are the number of people X in the college, the number of people Y Koky and Moky know and the number of queries Q to be made.

The three integers are then followed by a Q number of lines. Each line consists of an integer N ($1 \leq N \leq 10^9$), which is the number of people who will enter the garden.

Output

For each query, determine the number of people that it is probable that Koky and Moky know.

Sample test(s)

input
100 50 3 1 2 100
output
1 1 50

Note

If there's any chance that they know a certain person, just assume they know the person.

M. The $3n + 1$ problem

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

Consider the following algorithm:

- 1- input n
- 2- if $n = 1$ then STOP
- 3- if n is odd then $n = 3n + 1$.
- 4- else $n = n / 2$.
- 5- GOTO 2

For example you are given the input 22, the following sequence of numbers will be printed 22 11 34 17 52 26 13 40 20 10 5 16 8 4 2 1

Given an input n , it is possible to determine the number of numbers printed (including the 1). For a given n this is called the cycle-length of n . In the example above, the cycle length of 22 is 16.

For any two numbers i and j you are to determine the maximum cycle length over all numbers between i and j .

Input

The input will consist of a series of pairs of integers i, j ($0 < i \leq j \leq 1000000$) one pair of integers per line.

Output

Print the maximum cycle length over all numbers between i and j .

Sample test(s)

input
1 10
output
20
input
100 200
output
125
input
201 210
output
89

N. Jumping Mario

time limit per test: 2 seconds

memory limit per test: 64 megabytes

input: standard input

output: standard output

Mario is in the final castle. He now needs to jump over few walls and then enter the Koopa's Chamber where he has to defeat the monster in order to save the princess. For this problem, we are only concerned with the "jumping over the wall" part. You will be given the heights of N walls from left to right. Mario is currently standing on the first wall. He has to jump to the adjacent walls one after another until he reaches the last one. That means, he will make $(N-1)$ jumps. A high jump is one where Mario has to jump to a taller wall, and similarly, a low jump is one where Mario has to jump to a shorter wall. Can you find out the total number of high jumps and low jumps Mario has to make?

Input

The first line starts with an integer N ($0 < N < 50$) that determines the number of walls. The next line gives the height of the N walls from left to right. Each height is a positive integer not exceeding 10.

Output

Print two integers, total high jumps and total low jumps, respectively.

Sample test(s)

input
8 1 4 2 2 3 5 3 4
output
4 2
input
1 9
output
0 0
input
5 1 2 3 4 5
output
4 0