Tasks

Task	CETIRI	OKTALNI	TAJNA	DEJAVU	CUDAK	REDOKS
Input	standard input (keyboard)					
Output	standard output (screen)					
Memory limit (heap+stack)	32 MB					64 MB
Time limit (per test)	1 second					3 seconds
Number of tests	5	5	8	10	10	10
Points per test	4	4	5	5	8	9
Total points	**20**	**20**	**40**	**50**	**80**	**90**
	300					

Note: The evaluation system has two Intel Pentium 4 3.0 GHz processors and is running the Linux operating system. The following compile options are used for different languages:

- C: –O2 –s –static –std=c99 –lm

- C++: –O2 –s –static –lm

- Pascal: –O1 –XS

1. CETIRI

Mirko has chosen four integers which form an arithmetic progression. In other words, when the four numbers are sorted, then the difference between each pair of **adjacent** elements is **constant**.

As has become usual, Mirko **lost** one of the numbers and also is not sure whether the remaining three are in the correct (sorted) order.

Write a program that, given the three remaining numbers, finds the fourth number.

Input

The input contains 3 integers between -100 and 100 on a single line, separated by single spaces.

Note: the input data will guarantee that a solution, although not necessarily unique, will always exist.

Output

Output any number which could have been the fourth number in the sequence.

Sample test data

input	input
4 6 8	10 1 4
output	**output**
10	7

Slavko is learning about different numeral systems. Slavko is not the brightest when it comes to math, so he is starting out converting binary numerals to octal. The algorithm Slavko uses is this:

- Pad the binary numeral with zeros on the left until the number of digits is divisible by three.

- Group adjacent binary digits into groups of 3 digits.

- Replace each group of binary digits with the corresponding octal digit (as in the table on the right).

Write a program that converts a binary numeral to octal so that Slavko can verify his results.

000	0
001	1
010	2
011	3
100	4
101	5
110	6
111	7

Input

The input contains a binary numeral. The number of digits will be less than 100, and the first digit will be 1.

Output

Output the number in octal.

Sample test data

input	input
1010	11001100
output	**output**
12	314

3. TAJNA

Every evening, little Ivica sends secret messages to little Marica through e-mail. Knowing Ivica's e-letter travels unguarded through the network on its way to Marica's e-mailbox, they have decided to encrypt every message using the following algorithm:

- Suppose Ivica's message consists of N characters.

- Ivica must first find a matrix consisting of R rows and C columns **such that R ≤ C** and R·C = N. If there is more than one such matrix, Ivica chooses the one with the most rows.

- Ivica writes his message into the matrix in row-major order. In other words, he writes the first segment of the message into the first row, the second segment into the second row and so on.

- The message he sends to Marica is the matrix read in column-major order.

Marica has grown tired of spending her precious time deciphering Ivica's messages, so you must write a program to do it for her.

Input

The input contains the received message, a string of lowercase letters of the English alphabet (with no spaces).

The number of letters will be between 1 and 100.

Output

Output the original (decrypted) message.

Sample test data

input	input	input
bok	koaski	boudonuimilcbsai
output	**output**	**output**
bok	kakosi	bombonisuuladici

Third sample test:

Ivica wants to send the message "bombonisuuladici" containing 16 letters. He can use a 1×16, 2×8 or 4×4 matrix. Of these, the 4×4 has the most rows. When the message is written into it, the matrix looks like this:

b	o	m	b
o	n	i	s
u	u	l	a
d	i	c	i

4. DEJAVU

N points are placed in the coordinate plane.

Write a program that calculates how many ways we can choose three points so that they form a **right** triangle with **legs** parallel to the coordinate axes.

A right triangle has one 90-degree internal angle. The legs of a right triangle are its two shorter sides.

Input

The first line of input contains the integer N ($3 \leq N \leq 100\,000$), the number of points.

Each of the following N lines contains two integers X and Y ($1 \leq X, Y \leq 100\,000$), the coordinates of one point.

No pair of points will share the same pair of coordinates.

Output

Output the number of triangles.

Scoring

In 40% of all test cases, N will be less than 100.

In 70% of all test cases, N will be less than 10000.

Sample test data

input	input	input
3	5	6
4 2	1 2	10 10
2 1	2 1	20 10
1 3	2 2	10 20
	2 3	20 20
output	3 2	30 20
		30 30
0	output	
		output
	4	
		8

5. CUDAK

Božo is a strange little boy. Every day he tires his friends with strange questions. Today's question is: how many integers in the interval [A, B] are there such that the sum of their digits is S, and which is the smallest such number?

Write a program that answers Božo's question so that he can get some sleep.

Input

The input contains three integers A, B and S ($1 \leq A \leq B < 10^{15}$, $1 \leq S \leq 135$).

Output

The first line should contain the number of integers in the interval with the digit sum equal to S.

The second line should contain the smallest such integer.

The input data will guarantee that the first number is at least 1.

Scoring

For correctly outputting one of the two numbers you will receive 50% of the score.

Note: if you want to receive credit for just the second number, be sure to output something (0, for example) as the first number so the judge can interpret your output correctly.

Sample test data

input	input	input
1 9 5	1 100 10	11111 99999 24
output	**output**	**output**
1	9	5445
5	19	11499

6. REDOKS

Luka is not paying attention in class again, while the teacher is explaining redox reactions. Instead of paying attention, he is playing with analog dials.

An analog dial is a small device which always shows one digit between 0 and 9. It also contains a small button which increases the number by 1 (unless it is 9, in which case it is changed to 0).

Luka has N such dials on his desk, numbered 1 to N left to right, and two sheets of paper for him to write on.

Luka's game starts with him setting the dials in some starting configuration, which he then writes onto the first sheet. Luka then does the following M times:

- Choose two integers A and B (1 ≤ A ≤ B ≤ N) and write them down on the first sheet.

- Calculate the sum of numbers on dials numbered between A and B (inclusive), and write the sum down on the second sheet.

- Press the button once on all dials numbered between A and B.

Just as he had finished his game, the teacher noticed him, and took away all his dials and the **second** sheet of paper.

Given the contents of the first sheet, help him calculate the numbers on the second sheet.

Input

The first line contains two integers N and M (1 ≤ N ≤ 250 000, 1 ≤ M ≤ 100 000).

The second line contains the initial configuration of the dials, N decimal digits with no spaces. The first digit is the number initially on dial 1, the second digit the number on dial 2 and so on.

Each of the following M lines contains two integers A and B (1 ≤ A ≤ B ≤ N).

Output

Output M lines, the sums calculated by Luka, in order in which he calculated them.

Scoring

In 30% of all test cases, the numbers N and M will be less than 1000.

6. REDOKS

Sample test data

input	input	input
4 3	4 4	7 5
1234	1234	9081337
1 4	1 1	1 3
1 4	1 2	3 7
1 4	1 3	1 3
	1 4	3 7
output		1 3
	output	
10		**output**
14	1	
18	4	17
	9	23
	16	1
		19
		5