Questions of Advanced-Programing course at Shahid-Beheshti-University

Introduction to java

by

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The most frequent number

Write a program that receives a number and prints its most frequent digit.

If there are multiple answers, print the smallest answer.

Using array and string is not allowed, but you can define as many variables as you like.

Entrance

A number of up to 18 digits is given (so that you can get it in the long input)

Output

On the only output line, print only one digit that is the most frequent (and if there are multiple!) digits in the given number.

The first night

Numbers that have exactly two divisors are called prime numbers. Numbers that have exactly three divisors are called prime numbers. By writing a program, get a number of numbers from the user and print for each one whether it is prime or not.

Entrance

In the first line, get NNN (the number of numbers to be checked) from the user. On the next line, get NNN numbers from the user, separated by spaces, and print the answer for each of them on a separate line.

$$N \leq 100$$

$$Ai \leq 10^4$$

Output

If the number is pseudo-prime, YES will be printed in the output, otherwise NO.

Each output should be printed on a separate line.

Calculation of the area of the triangle

Write a program that takes a decimal number as the side of an equilateral triangle and prints the area of the corresponding triangle in the output (up to four decimal places) as long as the user has not entered the number -1. Print each area on a separate line.

Entrance

An unspecified number of decimal numbers, unless the user has entered -1

Output

The area of each triangle, each on a separate line, up to four decimal places

The area of the common area

Write a program that receives the specifications of 2 circles from the user, calculate the area of the common area between them.

Entrance

Enter three numbers in the first line and three numbers in the second line.

In each row, the first two numbers are the center of the circle, respectively, x and y, and the third number is the radius of the circle.

Output

Output the area of the common area of two circles with three decimal places. Truncate (do not round) the output number.

Triangular processes

Write a program that, by receiving the coordinates of 3 points, determines whether these points can be 3 vertices of a triangle or not. If they form a triangle, print the area of the triangle to 2 decimal places.

Entrance

3 pairs of X and Y in 3 lines.

Note that X and Y are separated by a space.

Output

If they form a triangle, type YES and in the next line, print the area value up to 2 decimal places.

If they do not form a triangle, just print NO.

Advanced reverse

You must have written a program to print the reciprocal of a number in the course of programming basics. As you remember, it was a very simple exercise. Now we are going to make the same question a little more challenging, so that you have to invert only part of the number. When you get 3 numbers NNN, LLL and RRR, invert the NNN number from the LLL digit to the RRR digit and print the rest in the same order as before.

Entrance

First enter the number NNN, which is your main number. Then the numbers L and R (the bigger R is equal to L.)

$$0 \leq N \leq 10^9$$

It is guaranteed that the number N has at least R digits.

$$0 \leq L \leq R \leq \text{length}(N)$$

Output

Print the requested output on one line.

Pay attention to whether the ranges are inclusive or exclusive

right turn (credit)

The rotation operation to the right is defined as follows: all digits are moved one unit to the right, and the right digit is moved to the left of the number: 123 -> 312

Write a program that takes two numbers M and N from the user as input. Move the number M to base 16 and then rotate the resulting number N times to the right.

Entrance

Get M (the number itself) in the first line and N in the next line.

$$M, N \leq 10^9$$

Output

The number obtained by rotating the number M in base 16 N times. To print numbers 10 to 15 in base 16, use letters a, b, c, d, e, f.