

Online UIT – ACM
Programming Contest
2015



Problems Overview

September 7, 2015

Problem A: Array

Problem B: Juggling game

Problem C: Captain Vietnam

Problem D: Mobile Programming

Problem E: Fibonacci Sequence

Note: The input and output for all problems are standard input and output.

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Problem A: Array

An integer N is have two positive integers $x \leq y$ such that $N = x * y$. With this analysis we will create a new integer number $N_1 = (x - 1) * (y + 1)$. This number can be positive or 0. If it is positive we can choose a certain analysis and repeat the operation on.

Given a integer N ($N \leq 10000$), what the numbers can create.

Input

The input file consists of several datasets. Each dataset contains a positive integers N .

Output

For each dataset, write in one line list all the numbers created in ascending order.

Sample input	Sample output
12	3 4 6 7 10

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Problem B: Juggling game

Juggling game is described as follows: for an array; the value of each element in the array indicates the maximum number of jumps that one can jump backwards array. Starting from the first position of the array. Ask if you can go to the last part of it or not?

Input

The input file consists of several test cases. Each test case consists of an array of integer numbers.

Output

For each test case, print on a single line the result “true” or “false”.

Spample Input	Sample Output
2 0 1 0 1 9 4	false
1 3 1 1 1 4 4	true



Problem C: Captain Vietnam

Captain Vietnam want to choose soliders from platoon A and B for military exercise mission. He knows that the ability between two platoon is different. So, he sends you two list A and B consisting of integers (the “power index” of each solider), sorted in ascending order. Check whether it is possible to choose u soliders in list A and choose v soliders in list B so that any solider chosen in the list A is strictly having “power index” less than any solider chosen in the list B.

Input

The first line of the input file contains two integers n_A, n_B ($1 \leq n_A, n_B \leq 10^5$): the sizes of lists A and B, correspondingly.

The 2nd line contains two integers u and v ($1 \leq u \leq n_A, 1 \leq v \leq n_B$).

The 3rd line contains n_A numbers a_1, a_2, \dots, a_{n_A} ($-10^9 \leq a_1 \leq a_2 \leq \dots \leq a_{n_A} \leq 10^9$): elements of list A.

The 4th line contains n_B integers b_1, b_2, \dots, b_{n_B} ($-10^9 \leq b_1 \leq b_2 \leq \dots \leq b_{n_B} \leq 10^9$): elements of list B.

All number are separated by spaces.

Output

Print "YES" (without the quotes), if you can choose u soliders in list A and v soliders in list B so that any solider chosen in list A was strictly having “power index” less than any solider chosen in list B. Otherwise, print "NO" (without the quotes).

Sample Input	Sample Output
4 4 2 1 2 3 4 5 5 6 7 8	YES

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Note

In the sample test you can, for example, choose numbers 2 and 3 from list A and number 5 from array B ($2 < 5$ and $3 < 5$).



Problem D: Mobile Programming

You are new to mobile programming and you want to re-create the classic ninja fruit game. In this game, player will “slash” across the screen with their finger, trying to slice as may fruits as they can. The most basic part of the game will be determine whether a “slash” did hit a fruits. For the easiness sake let us pretend that when player made those slashes they will always draw in straight lines, the fruit will always be in rectangular shape and the Cartesian coordinate system is used.

Input

The input file consists of several test cases. Each test case consists start with 2 lines.

The first line contain 4 integer: x_{start} , y_{start} , x_{end} , y_{end} where (x_{start}, y_{start}) is the coordinate of the starting point of a “slash” and (x_{end}, y_{end}) is the end point of a slash.

The second line contain the integer n ($n < 1000$), this is the number of fruits current displayed on the screen.

Each of the last n lines of the test case will contain 4 integer, x_{bot} , y_{bot} , x_{top} , y_{top} where (x_{bot}, y_{bot}) is the bottom left corner of a rectangular shape fruit and (x_{top}, y_{top}) is the top right corner of a rectangular shape fruit.

(All the coordinates will be natural number smaller than 1000.)

Output

For each fruits, if it was “slashed”, output coordinates of the entry point and exit point of the slash (entry point is close to starting point and exit pint is close to end point)

If the slash did not cut the fruit, output the string “missed” (without quote)

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Sample Input	Sample Output
667 672 262 197	missed
6	missed
69 430 243 527	467 437 368 321
484 173 973 244	missed
368 315 750 437	531 512 422 384
8 214 184 481	587 578 279 216
141 384 590 512	
218 216 587 669	



Problem E: Fibonacci Sequence

Fibonacci sequence is a well-known integer sequence that has many beautiful properties.

If you do not know about it, you can search the internet (Remember in offline UIT-ACM or another ACM-ICPC format, using internet is cheating. We only accept you to use the internet on this contest). The mathematical of Fibonacci sequence is define by recurrence relation.

$$F_n = F_{n-1} + F_{n-2}, n = 2 \dots 3; F_0 = F_1 = 1$$

Given two Fibonacci number, your task is to find their greatest common divisor (Search Google, Bing, yahoo again !).

Input

The input file consists of several test cases, but no more than 1000. Each test case contains 2 integer numbers n and m ($0 \leq n, m \leq 10^9$).

Output

For each test case, print a line contatin value of greatest common divisor of F_n and F_m modulo by 1,000,000,007 (one billion and seven).

Sample Input	Sample Output
2	1
843 742	8
6 12	