**Access**

The virus attacked the filesystem of the supercomputer and broke the control of access rights to the files. For each file there is a known set of operations which may be applied to it:

* write W,
* read R,
* execute X.

You need to recover the control over the access rights to the files.

Virus đã tấn công vào hệ thống tập tin của siêu máy tính và phá vỡ quyền kiểm soát truy cập vào tập tin. Với mỗi tập tin đã có một tập hợp các thao tác có thể áp dụng vào:

* Viết W,
* Đọc R,
* Thực hiện X.

Việc bạn cần làm là phải phục hồi lại quyền kiểm soát truy cập vào các tập tin này.

**Input description**

* The first line contains the number N — the number of files contained in the filesystem.
* The following N lines contain the file names and allowed operations with them, separated by spaces.
* The next line contains an integer M — the number of operations to the files.
* In the last M lines specify the operations that are requested for files. One file can be requested many times.

**Constraints**

* *N*,*M*<100

**Output description**

For each request your program should return OK if the requested operation is valid or Access denied if the operation is invalid.

**Sample test case**

**Sample input 1**

4

helloworld.exe R X

pinglog W R

nya R

goodluck X W R

5

read nya

write helloworld.exe

execute nya

read pinglog

write pinglog

**Sample output 1**

OK

Access denied

Access denied

OK

OK

**Union Array**

Given two integer sequences *A* & *B*. Find the sequence *C* consisting of all the elements present in either sequence *A* & *B*.  
If an element appears more than once in the sequences *A* & *B*, then in the sequence *C* it must appear only once.

Cho hai dãy số nguyên AA & BB. Tìm dãy CC gồm tất cả các phần tử có trong dãy AA & BB.  
Nếu một phần tử xuất hiện nhiều hơn một lần trong dãy AA & BB, thì trong dãy CC nó chỉ được xuất hiện một lần

**Input description**

* The first line is an integer *T*, which is the number of test sets.
* Each test includes:
  + The first line of each test contains 2 integers *n* and *m* are the size of the two given sequences.
  + The second line of each test contains *n* integers *a*1​,*a*2​,...,*an*​ which are the elements of the first sequence.
  + The third line of each test contains *m* integer *b*1​,*b*2​,...,*bm*​ which are the elements of the second sequence.

**Constraints**

* 1≤*T*≤30
* 1≤*n*,*m*≤1000
* 1≤*ai*​,*bi*​≤1000

**Output description**

*T* lines, each line is the result of a test: the sequence of numbers after sorting ascending.

**Sample test case**

**Sample input 1**

2

5 3

1 2 3 4 5

1 2 3

6 2

85 25 1 32 54 6

85 2

**Sample output 1**

1 2 3 4 5

1 2 6 25 32 54 85

**Seniority**

A galaxy has *N* planets. The planets are numbered from 1 to *N*. The *i*\_th planet's age is *Ai*​ years.

For each *i*\_th planet, count how many planets are younger than that planet.

**Input description**

* The first line contains the integer *N* - the number of planets in that galaxy.
* The second line contains a sequence of *N* integers *A*1​,*A*2​,...,*AN*​ - indicating the age of planets.

**Constraints**

* 1≤*N*≤105
* 1≤*Ai*​≤109

**Output description**

* Print the sequence of *N* integers, the value of the *i*\_th integer indicates the number of planets are younger than that planet (*i*\_th planet).

**Sample test case**

**Sample input 1**

4

12 11 13 14

**Sample output 1**

1 0 2 3

**Explanation**

In the above example,

* there is 1 planet whose age is lower than the first planet;
* there is no (0) planet whose age is lower than the second planet;
* there are 2 planets whose age is lower than the third planet;
* there are 3 planets whose age is lower than the fourth planet;

**Hotel**

After its success in retail sales of computers and computer parts, Phong Vu has decided to expand its business into the hotel industry. The new business is going quite smoothly when many guests book rooms at this new hotel. A problem has arisen, though: Phong Vu's hotel is quite small and cannot immediately accommodate such a large number of guests, while each customer requests a single room. Therefore, Phong Vu must build more rooms for the hotel. To maximize its profits, Phong Vu wants to build as few rooms as possible while still meeting the needs of all customers.

The company's employees have recorded the arrival and rental times of all guests. Please help Phong Vu calculate the minimum number of rooms that need to be built to serve all the guests.

**Input description**

* The 1st line is a positive integer *N* - number of guests.
* The 2nd line consists of *N* positive integers *ai*​ - Arrival time of the *i*\_th guest.
* The 3rd line consists of *N* positive integers *bi*​ - Rental time of the *i*\_th guest.

**Constraints**

* 1≤*N*≤105.
* 1≤*ai*​,*bi*​≤109;1≤*i*≤*N*.

**Output description**

* Contains a single positive integer that is the minimum number of rooms that need to be built to serve all *N* guests. A room can be used if it is newly built or at the time of use the room is empty.

**Sample test case**

**Sample input 1**

3

1 2 3

3 3 3

**Sample output 1**

3

**Sample input 2**

3

1 2 5

2 3 2

**Sample output 2**

2

**Đề2**

**Good Password**

Given a string, please check if it can be used as a good password or not.

A good password is a string that sastifies at the same time the following conditions:

* At least 1 letter between [a-z] and 1 letter between [A-Z].
* At least 1 number between [0-9].
* At least 1 character from [$#@].
* Minimum length 6 characters.
* Maximum length 16 characters.

**Input description**

* The only line contain the given string

**Constraints**

* String length <20

**Output description**

* YES if the given string can be used as a good password;
* NO otherwise.

**Sample test case**

**Sample input 1**

passwordWr@a

**Sample output 1**

NO

**Sample input 2**

passwordW3r@100a

**Sample output 2**

YES

**File Names**

You are given *n* desired file names in the order of their creation.

Since two files cannot have the names in the OS, the one which comes later will have an additional part to the end of its name in a form of (k), where k is the smallest positive integer such that the obtained name is not used yet.

**Input description**

* First line contains the number *n*
* Then followed by *n* filenames in *n* lines

**Constraints**

* 5≤*n*≤1000,
* 1≤ filename length ≤15

**Output description**

List of names that will be given to the files, each in a separate line.

**Sample test case**

**Sample input 1**

5

doc

doc

image

doc(1)

doc

**Sample output 1**

doc

doc(1)

image

doc(1)(1)

doc(2)

**Sample input 2**

5

doc

doc

image

doc(1)

doc

**Sample output 2**

doc

doc(1)

image

doc(1)(1)

doc(2)

**Candy**

On the occasion of the Mid-Autumn Festival, Teko company organizes a full-moon party for its employees and their families. Attending the party are *C* children who are children of the employees, and the company has prepared *N* bags of candies numbered from 1 to *N* as gifts. The i-th candy bag contains *Pi*​ candies. The human resources department will give the candies to our *C* little friends. Because the candies are so delicious, the kids will all eat up their candies before participating in other activities. Each child in 1 second can finish *T* candies.

In order to optimize the time for other activities in the party, the human resources department wants to divide all the candies among the children in such a way that the time they spend on eating candies is as small as possible. How many seconds is this minimum time (rounded up to the nearest integer), knowing that each child will be given consecutively numbered bags of candies and each bag can only be distributed to 1 little friend?

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**Input description**

* The 1st line consists of integers *N*,*C*,*T*.
* The next line consists of *N* integers. The *i*\_th number is value of *Pi*​.

**Constraints**

* 1≤*N*,*C*≤105,1≤*T*≤50
* 1≤*Pi*​≤105

**Output description**

* The single integer, which is the time duration (number of seconds) that we have to calculate.

**Sample test case**

**Sample input 1**

5 3 4

5 8 3 10 7

**Sample output 1**

4

**Explanation**

* • the first child eats the first 22 candy in 44 seconds.
* • the 22nd kid eats the 33rd candy in 33 seconds.
* • the last kid ate the candy 44 in 22 seconds.

**Hotel**

After its success in retail sales of computers and computer parts, Phong Vu has decided to expand its business into the hotel industry. The new business is going quite smoothly when many guests book rooms at this new hotel. A problem has arisen, though: Phong Vu's hotel is quite small and cannot immediately accommodate such a large number of guests, while each customer requests a single room. Therefore, Phong Vu must build more rooms for the hotel. To maximize its profits, Phong Vu wants to build as few rooms as possible while still meeting the needs of all customers.

The company's employees have recorded the arrival and rental times of all guests. Please help Phong Vu calculate the minimum number of rooms that need to be built to serve all the guests.

Sau khi thành công trong các chuỗi bán lẻ máy tính và linh kiện, công ty Phong Vũ quyết định mở rộng ngành nghề kinh doanh sang lĩnh vực cho thuê khách sạn. Công việc kinh doanh mới diễn ra khá thuận lợi khi có rất nhiều khách đặt phòng ở khách sạn mới này. Điều này nảy sinh ra một vấn đề mới: Khách sạn của Phong Vũ khá nhỏ và chưa thể đáp ứng ngay lượng khách lớn như vậy, trong khi mỗi khách hàng lại yêu cầu được ở một mình một phòng, do đó bắt buộc Phong Vũ phải xây thêm phòng cho khách sạn. Để tối ưu lợi nhuận, Phong Vũ muốn xây thêm càng ít phòng càng tốt mà vẫn đáp ứng được nhu cầu của tất cả các khách hàng.

Các nhân viên của công ty đã ghi chép lại thời gian đến và thời gian thuê phòng của tất cả các khách tới thuê. Hãy giúp Phong Vũ tính toán số lượng phòng ít nhất cần xây thêm để phục vụ hết khách.

**Input description**

* The 1st line is a positive integer *N* - number of guests.
* The 2nd line consists of *N* positive integers *ai*​ - Arrival time of the *i*\_th guest.
* The 3rd line consists of *N* positive integers *bi*​ - Rental time of the *i*\_th guest.

**Constraints**

* 1≤*N*≤105.
* 1≤*ai*​,*bi*​≤109;1≤*i*≤*N*.

**Output description**

* Contains a single positive integer that is the minimum number of rooms that need to be built to serve all *N* guests. A room can be used if it is newly built or at the time of use the room is empty.

**Sample test case**

**Sample input 1**

3

1 2 3

3 3 3

**Sample output 1**

3

**Sample input 2**

3

1 2 5

2 3 2

**Sample output 2**

2

**Đề 3**

**Trip**

Teko Company has *n* branches. All of these branches are located on a straight line and are numbered in ascending order from 1 to n. The distance between two adjacent branches is 1km. All roads connecting branches are one-way and can only go from one branch to another with a larger number.

At the end of this year, the company's director decided to make a trip to visit all *n* branches by car. The fuel tank capacity of this car is *v* liters, and the car consumes exactly 1 liter of gas for every 1 km of travel. At the beginning of the journey, the manager was at branch number 1 with an empty gas tank and wanted to go to branch *n*.

There is a gas station in front of each branch. At branch gate *i*, the price of 1 liter of gas is *i* dollars. The manager doesn't want to waste money on gas, so he wants to spend the minimum amount of money on gas to complete the trip. Please help the director calculate this minimum amount.

**Input description**

* 1 line with 2 integers *n* (number of branches) and *v* (gas tank capacity)

**Constraints**

* 2≤*n*≤
* 1≤*v*≤

**Output description**

* A single positive integer, which is the minimum amount the director needs to spend to buy gas for the trip.

**Sample test case**

**Sample input 1**

4 2

**Sample output 1**

4

**Sample input 2**

7 6

**Sample output 2**

6