
problems

problem	kino	editor	otmica
source file	kino.pas kino.c kino.cpp	editor.pas editor.c editor.cpp	otmica.pas otmica.c otmica.cpp
input data	stdin		
output data	stdout		
memory limit (heap)	16 MB		
memory limit (stack)	2 MB		
time limit (pentium4 1.6 ghz)	1 second		
points	40	50	60
	150		

kino

Mirko is celebrating his birthday and wants to invite his friends to the cinema.

They all like going to the cinema in big groups. Everyone requests that besides Mirko and himself/herself the certain number of other Mirko's friends comes to the cinema with them.

Mirko doesn't have enough money to invite them all so he wants to invite **minimal number of people**. He must determine such minimal group that every person's request is **satisfied** and it consists of at least one person.

Help Mirko to write a program that computes that number.

input data

In the first row there is an integer N , $2 \leq N \leq 10\,000$, number of friends.

In the next N rows there is one integer per row Z_i , $1 \leq Z_i < N$. That numbers represent requests of all Mirko's friends, that is, minimal number of people they are willing to go to the cinema with.

output data

In first and only row you should write minimal number of people Mirko can invite to the cinema.

examples

input

2

1

1

output

2

input

3

1

2

1

output

2

input

5

3

4

3

3

3

output

4

editor

You are given a text that is a sequence of characters.

Cursor can be positioned **inside** of the text (between any two consecutive characters), at the **beginning** (left of the first character) or at the **end** (right of the last character) of the text.

You are given sequence of operations you must perform on the text.

Possible operations are:

L move cursor one character to the **left** (if cursor is at the beginning, do nothing)

D move cursor one character to the **right** (if cursor is at the end, do nothing)

B **delete** character left of the cursor (if cursor is at the beginning, do nothing)

P \$ **add** character \$ right of the cursor (character \$ is any lowercase letter of English alphabet)

Before execution of given operations, cursor is **at the end** of the text.

Write a program that will determine what would the text look like after execution of given operations.

input data

In the first row there is the text. It consists only of lowercase letters of English alphabet and its maximal length is 100,000 characters.

In the next row there is an integer N , $1 \leq N \leq 500,000$, number of given operations.

In the next N rows there are operations given in the order of execution.

output data

In first and only row you should write text after the execution of all the operations.

examples

input

abcd

3

P x

L

P y

output

abcdyx

input

abc

9

L

L

L

L

L

P x

L

B

P y

output

yxabc

input

dmi h

11

B

B

P x

L

B

B

B

P y

D

D

P z

output

yxz

otmica

Bob was kidnapped at a street intersection in a city he is unfamiliar with. Kidnappers put him in the car and started driving to their secret hideout. They knew that Bob is unfamiliar with the city so they didn't blindfold him. Bob decided to remember the way.

City consists of **matrix of skyscrapers**. There is a street between every two neighboring skyscrapers. Streets are numbered starting from number 1 from top to down and from left to right.

When kidnappers drive through a street, Bob secretly notes down height of the skyscraper to the **left** of the car and to the **right** of the car. After the car drives through the intersection, Bob again notes the heights and so on. On every intersection, driver can turn **left**, go **straight**, turn **right** or turn **back**. When they reached the hideout, Bob sent an SMS with all the heights to the police.

Write the program that will help the police to determine coordinates of the intersection where kidnapper's hideout is.

input data

In the first row there are two integers R and S , $3 \leq R, S \leq 100$, number of rows and columns of matrix of skyscrapers in the city.

In the next R rows there are S integers per row, heights of the skyscrapers. Every skyscraper is tall at least 1 and at most 10,000.

In the next row there is an integer N , $1 \leq N \leq 10,000$, length of the path kidnappers drove Bob on.

In the next row there are N numbers, heights of the skyscrapers which Bob saw on the **left** of the car.

In the next row there are N numbers, heights of the skyscrapers which Bob saw on the **right** of the car.

output data

In first and only row you should write coordinates (**first row, then column**) of the intersection where kidnapper's hideout is. **If there are multiple solutions, write any one of them.**

examples

input

3 3
1 2 3
4 5 6
7 8 9
3
4 2 6
5 5 5

output

2 2

input

4 4
7 3 5 4
2 8 9 7
3 5 2 8
1 3 5 7
5
5 9 8 2 9
2 2 2 8 7

output

1 3

input

4 4
1 2 2 1
2 1 1 2
1 2 1 2
2 1 1 2
5
1 1 1 1 1
2 2 1 2 2

output

1 2