

1D ARRAY

1)Welcome Party

New Year is shortly arriving and the students of St. Philip's College of Business are eager to receive the freshers for the coming year. The Welcome party for the freshers is going to be organized in a week's time and in connection to that the College Management has ordered the students to renovate their class room block. The Class room block has N rooms in it numbered from 1 to N . Each room is currently painted in one of the red, blue or green colors. Students are given configuration of colors of their class room block by an array consisting of N values. In this array, color red will be denoted by '1', green by '2' and blue by '3'.

The Management wanted the class room block to be repainted such that each class room has same color. For painting, Students have all the 3 color paints available and mixing any 2 color paints will result into 3rd color paint i.e

- $1 + 2 = 3$
- $2 + 3 = 1$
- $3 + 1 = 2$

For example, if a room is already painted in green color, painting that room red color, will make the color of the room blue.

Also, students have many buckets of paint of each color. Simply put, you can assume that they will not run out of paint. Students are a bit lazy, so they does not want to work much and therefore, has asked you to find the minimum number of rooms they have to repaint (possibly zero) in order to have all the rooms with same color as told by the Management. Can you please help them?

Input Format:

First line of input contains an integer N , denoting the number of class rooms in the College's class room block. Assume that the maximum value for N as 50.

Next line of input contains N values, denoting the current color configuration of rooms.

Output Format:

Print the minimum number of rooms that need to be painted in order to have all the rooms painted with same color i.e red, blue or green.

Refer sample input and output for formatting specifications.

Sample Input 1:

```
3
1 2 1
```

Sample Output 1:

```
1
```

Sample Input 2:

3
1 1 1

Sample Output 2:

0

2)Friendship Test

Michael is celebrating his 10th birthday and he wished to arrange a party to all his class mates. But there are n tough guys amongst his class who are weird. They thought that this is the best occasion for testing their friendship with him. They put up conditions before Michael that they will break the friendship unless he gives them a grand party on their chosen day. Formally, i^{th} friend will break his friendship if he does not receive a grand party on d_i^{th} day.

Michael is not a lavish spender and can give at most one grand party daily. Also, he wants to invite only one person in a party. So he just wonders what the maximum number of friendships he can save.

Please help Michael in this difficult task.

Input Format:

First line will contain a single integer denoting n . Assume that the maximum value for n as 50.

Second line will contain n space separated integers where i^{th} integer corresponds to the day d_i^{th} as given in the problem.

Output Format:

Print a single line corresponding to the maximum number of friendships Michael can save. Refer sample input and output for formatting specifications.

Sample Input 1:

2
3 2

Sample Output 1:

2

Sample Input 2:

5
4 1 3 7 5

Sample Output 2:

5

3)Version Management System

A version Management system (VMS) is a repository of files, often the files for the source code of computer programs, with monitored access. Every change made to the source is tracked, along with who made the change, why they made it, and references to problems fixed, or enhancements introduced, by the change.

In this problem we will consider a simplified model of a development project. Let's suppose that there are N source files in the project. All the source files are distinct and numbered from 1 to N .

A VMS which is used for maintaining the project contains two sequences of source files. The first sequence contains M source files that are ignored by the VMS. If a source file is not in the first sequence, then it's considered to be unignored. The second sequence contains K source files that are tracked by the VMS. If a source file is not in the second sequence, then it's considered to be untracked.

A source file can either be or not be in any of these two sequences. Your task is to calculate two values: the number of source files of the project, that are both tracked and ignored, and the number of source files of the project, that are both untracked and unignored.

Input Format:

The first line of the input contains three integers N , M and K denoting the number of source files in the project, the number of ignored source files and the number of tracked source files. Assume that the maximum value for N as 50.

The second line contains M distinct integers denoting the sequence A of ignored source files. The sequence is strictly increasing.

The third line contains K distinct integers denoting the sequence B of tracked source files. The sequence is strictly increasing.

Output Format:

Output a single line containing two integers: the number of the source files, that are both tracked and ignored, and the number of the source files, that are both untracked and unignored.

Refer sample input and output for formatting specifications.

Sample Input 1:

```
7 4 6
1 4 6 7
1 2 3 4 6 7
```

Sample Output 1:

```
4 1
```

Sample Input 2:

```
4 2 2
1 4
3 4
```

Sample Output 2:

```
1 1
```

4) Lucy at the Film Festival

Lucarno's Film Festival is an annual film festival and is also known for being a prestigious platform for art house films. This time at the Lucarno's Film festival there are N movies screened, each of different genre ranging from drama movies to comedy ones and teen movies to horror ones. Lucy is a huge fan of movies and visited the film festival, but she's not sure which movie she should watch.

Each movie can be characterized by two integers L_i and R_i , denoting the length and the rating of the corresponding movie. Lucy wants to watch exactly one movie with the maximal value of $L_i \times R_i$. If there are several such movies, she would pick a one with the maximal R_i among them. If there is still a tie, she would pick the one with the minimal index among them.

Write a program to help Lucy pick a movie to watch at the film festival.

Input Format:

The first line of the input description contains an integer n . Assume that the maximum value for n is 50.

The second line of the input description contains n integers $L_1, L_2, \dots, L_n$.

The following line contains n integers $R_1, R_2, \dots, R_n$.

Output Format:

Output a single integer i denoting the index of the movie that Lucy should watch in the film festival. Note that you follow 1-based indexing.

Refer sample input and output for formatting specifications.

Sample Input 1:

```
2
1 2
2 1
```

Sample Output 1:

```
1
```

Sample Input 2:

```
4
2 1 4 1
2 4 1 4
```

Sample Output 2:

```
2
```

5)Best Couple Event

"Shades" Television Channel organizes a fun-filled event named "Best Couple 2017", where in married couples would be invited and given many tasks and activities.

Based on some criteria decided by the jury, a best couple will be chosen.

N couples registered for the event and each couple was given a unique registration number. One specific couple's registration Id got missed. The event coordinators wanted your help in finding the missing Id.

Write a program which takes an array of registration numbers as input and outputs the missing registration Id.

Input Format:

First line of the input contains the number of couples **N** who registered for the event. Assume that the maximum value for **N** as 50.

Second line of input contains **N** registration Id of each of the couple, separated by a space.

Output Format:

Output in a single line the missing registration Id.

Refer sample input and output for formatting specifications.

Sample Input 1:

```
3
1 2 1
```

Sample Output 1:

```
2
```

Sample Input 2:

```
5
1 1 2 2 3
```

Sample Output 2:

```
3
```

6)Favorite Sequence

Lucarnos Film Festival is an annual film festival and is also known for being a prestigious platform for art house films. Lucy, being a movie lover visits the Lucarnos Film Festival.

There were many films screened in the show, of which Lucy somehow choose the best movie of her choice and set off to watch it.

The movie which Lucy chose to watch has **N** sequences. A sequence is defined as a series of scenes in a movie that form a distinct narrative unit. Lucy likes a sequence better if the sequence contains her favorite sequence in the movie as a substring.

Given the sequence and Lucy's favorite sequence(**F**) check whether her favorite sequence is

contained in the sequence.

Input Format:

The first line of the input contains an integer N , which corresponds to the length of the sequence.

The second line of the input contains N space-separated integers, which corresponds to the sequence.

The third line of the input contains an integer n , which corresponds to the length of favorite sequence F .

The last line of the input contains n space-separated integers, which corresponds to the favorite sequence.

Output Format:

Print "Yes" (Without quotes) if the sequence contains Lucy's favourite sequence otherwise print "No" (Without quotes).

Refer sample input and output for formatting specifications

Sample Input 1:

```
6
1 2 3 4 5 6
3
2 3 4
```

Sample Output 1:

Yes

Sample Input 2:

```
6
22 5 6 33 1 4
2
4 15
```

Sample Output 2:

No

7)Library Time table

With the initiative of the Students Council of Sherland State University, the College Management has inaugurated a mini library in the hostel premises. There are N students living in the hostel. Any student can use the library but on a condition that only one student should avail it at a time. Based on this condition, the Hostel Warden came up with a timetable for library's usage in order to avoid the conflicts:

- The first student starts to use the library at the time O and should finish the reading not later than at the time A_1 .

- The second student starts to use the library at the time A_1 and should finish the reading not later than at the time A_2 .
- And so on.
- The N -th student starts to use the library at the time A_{N-1} and should finish the reading not later than at the time A_N

The holidays in Sherland are approaching, so today each of these N students wants to read some new edition of "Heart of Darkness". The i -th student needs B_i units of time to read the book.

The students have understood that probably not all of them will be able to read everything they want from the book. How many students will be able to read the book without violating the schedule?

Input Format:

The first line of input contains a single integer N denoting the number of students. Assume that the maximum value for N is 50.

The second line contains N space-separated integers $A_1, A_2, \dots, A_N$ denoting the moments of time by when the corresponding student should finish reading.

The third line contains N space-separated integers $B_1, B_2, \dots, B_N$ denoting the time required for each of the students to read.

Output Format:

Output a single line containing the number of students that will be able to finish reading.

Refer sample input and output for formatting specifications.

Sample Input 1:

```
3
1 10 15
1 10 3
```

Sample Output 1:

```
2
```

Sample Input 2:

```
3
10 20 30
15 5 20
```

Sample Output 2:

```
1
```

8)Competitive Test

"Axcent Academy" has arranged for a competitive test for medical students from rural villages. Those successful students of the test will be awarded the scholarship for their NEET preparations at Axcent Academy. Benny, the co-coordinator and founder of the academy has given one problem for the first stage of the test. The problem goes like this:

Given an array $A_1, A_2, \dots, A_N$, count the number of subarrays of array A which are non-decreasing.

A subarray $A[i, j]$, where $1 \leq i \leq j \leq N$ is a sequence of integers $A_i, A_{i+1}, \dots, A_j$.

A subarray $A[i, j]$ is non-decreasing if $A_i \leq A_{i+1} \leq A_{i+2} \leq \dots \leq A_j$. Count the total number of such subarrays.

Benny himself has not computed the solution of the problem. Write a program to help him find the answer for the same to evaluate the students.

Input Format:

The first line of input contains a single integer N denoting the size of array. Assume that the maximum value for N as 50.

The second line contains N space-separated integers $A_1, A_2, \dots, A_N$ denoting the elements of the array.

Output Format:

Output in a single line, the count of the total number of such subarrays.

Refer sample input and output for formatting specifications.

Sample Input 1:

4

1 4 2 3

Sample Output 1:

6

Sample Input 2:

3

3 1 4

Sample Output 2:

4

9)Bob's Challenge

Stella and friends have set out on a vacation to Manali. They have booked accommodation in a resort and the resort authorities headed by Bob, organize Camp fires every night as a part of their daily activities. Stella volunteered herself for an activity called the "Stick Game".

Stella was given a total of N sticks. Length of i -th stick is A_i . Bob insists Stella to choose any four sticks and to make a rectangle with those sticks as its sides. Bob warns Stella not to break any of the sticks, she has to use sticks as a whole.

Also, Bob wants that the rectangle formed should have the maximum possible area among all the rectangles that Stella can make. Stella takes this challenge up and overcomes it. You have to help her know whether it is even possible to create a rectangle. If yes, then tell the maximum possible area of rectangle.

Input Format:

The first line of the input contains a single integer N denoting the number of sticks.

The second line of each test case contains N space-separated integers $A_1, A_2, \dots, A_N$ denoting the lengths of sticks.

Output Format:

Output a single line containing an integer representing the maximum possible area for rectangle or output -1, if it's impossible to form any rectangle using the available sticks.

Refer sample input and output for formatting specifications.

Sample Input 1:

```
5
1 2 3 1 2
```

Sample Output 1:

```
2
```

Sample Input 2:

```
4
1 2 2 3
```

Sample Output 2:

```
-1
```

10)Adjacent Stick Game

Mukesh and friends have set out on a vacation to Coorg. They have booked accommodation in a resort and the resort authorities organize Camp fires every night as a part of their daily activities. Mukesh volunteered himself for an activity called the "Adjacent Stick Game" where sticks of different length will be placed in a line and Mukesh needs to remove a stick from each adjacent pair of sticks. He then has to form a bigger stick by combining all the remaining sticks.

Mukesh needs to know the smallest length of the bigger stick so formed and needs your help to compute the same. Given the number of sticks N and the lengths of each of the sticks, write a program to find the smallest length of the bigger stick that is formed.

Input Format:

First line of input contains an integer N denoting the number of sticks. Assume that the maximum value for N as 50.

Assume that N is always even.

Next line of input contains an N integer denoting the length of each of the sticks.

Output Format:

Output the smallest length of the bigger stick that is formed.

Refer sample input and output for formatting specifications.

Sample Input 1:

```
4
2 1 3 1
```

Sample Output 1:

```
2
```

Sample Input 2:

```
4
4 2 3 5
```

Sample Output 2:

```
5
```