Ex. No. : 5.1

Balanced Array

Given an array of numbers, find the index of the smallest array element (the pivot), for which the sums of all elements to the left and to the right are equal. The array may not be reordered.

Example

arr=[1,2,3,4,6]

          the sum of the first three elements, 1+2+3=6. The value of the last element is 6.

          Using zero based indexing, arr[3]=4 is the pivot between the two subarrays.

          The index of the pivot is 3.

Constraints

          3 = n = 105

          1 = arr[i] = 2   104, where 0 = i < n

          It is guaranteed that a solution always exists.

The first line contains an integer n, the size of the array arr.

Each of the next n lines contains an integer, arr[i], where 0 = i < n.

For example:

Input

Result

4

1

2

3

3

2

3

1

2

1

1

a=int(input())

l=[]

for i in range(a):

    l.append(int(input()))

c=sum(l)//2

q=0

for j in l:

    q+=j

    if q >=c:

        q=j

        break;

print(l.index(q))

Ex. No. : 5.2

Check pair with difference k

Given an array A of sorted integers and another non negative integer k, find if there exists 2 indices i and j such that A[i] - A[j] = k, i != j.

Input Format

1.      First line is number of test cases T. Following T lines contain:

2.      N, followed by N integers of the array

3.      The non-negative integer k

Output format

Print 1 if such a pair exists and 0 if it doesn't.

Input

1

3

1

3

5

4

Output:

1

Input

1

3

1

3

5

99

Output

0

n=int(input())

for i in range (n):

    n1=int(input())

    l=[]

    for i in range (n1):

        b=int(input())

        l.append(b)

    b1=int(input())

    c=0

    for i in range (n1):

        for j in range(i,n1):

            if(abs(l[i]-l[j])==b1):

               c+=1

               break

    if(c>0):

        print(1)

    else:

        print(0)

Ex. No. : 5.3

Count Elements

Complete the program to count frequency of each element of an array. Frequency of a particular element will be printed once.

Sample Test Cases

 Test Case 1

 Input

 7

23

45

23

56

45

23

40

 Output

 23 occurs 3 times

45 occurs 2 times

56 occurs 1 times

40 occurs 1 times

n=int(input())

l=[]

l1=[]

for i in range (n):

    b=int(input())

    l.append(b)

for i in l:

    count=0

    for j in l:

        if i==j:

            count+=1

    if i not in l1:

        l1.append(i)

        print("%d occurs %d times"%(i,count))

Ex. No. : 5.4

Distinct Elements in an Array

Program to print all the distinct elements in an array. Distinct elements are nothing but the unique (non-duplicate) elements present in the given array.

Input Format:

First line take an Integer input from stdin which is array length n.

Second line take n Integers which is inputs of array.

Output Format:

Print the Distinct Elements in Array in single line which is space Separated

Example Input:

5

1

2

2

3

4

Output:

1 2 3 4

Example Input:

6

1

1

2

2

3

3

Output:

1 2 3

For example:

Input

Result

5

1

2

2

3

4

1 2 3 4

6

1

1

2

2

3

3

1 2 3

n=int(input())

s=[]

for i in range (n):

    b=int(input())

    if(b not in s):

        s.append(b)

        print(b,end=" ")

Ex. No. : 5.5

Element Insertion

Consider a program to insert an element / item in the sorted array. Complete the logic by filling up required code in editable section. Consider an array of size 10. The eleventh item is the data is to be inserted.

Sample TestCases

Test Case 1

Input

1

3

4

5

6

7

8

9

10

11

2

Output

ITEM to be inserted:2

After insertion array is:

1

2

3

4

5

6

7

8

9

10

11

Test Case 2

Input

11

22

33

55

66

77

88

99

110

120

44

Output

ITEM to be inserted:44

After insertion array is:

11

22

33

44

55

66

77

88

99

110

120

l=[]

for i in range(10):

    b=int(input())

    l.append(b)

n1=int(input())

print("ITEM to be inserted:%d"%(n1))

for i in range(10):

    if(n1<l[i]):

        l.insert(i,n1)

        break

print("After insertion array is:")

for i in range(11):

    print(l[i])

Ex. No. : 5.6

Find the Factor

Determine the factors of a number (i.e., all positive integer values that evenly divide into a number) and then return the pth element of the list, sorted ascending. If there is no pth element, return 0.

Constraints

1 = n = 1015

1 = p = 109

The first line contains an integer n, the number to factor.

The second line contains an integer p, the 1-based index of the factor to return.

Sample Case 0

Sample Input 0

10

3

Sample Output 0

5

Explanation 0

Factoring n = 10 results in {1, 2, 5, 10}. Return the p = 3rd factor, 5, as the answer.

Sample Case 1

Sample Input 1

10

5

Sample Output 1

0

Explanation 1

Factoring n = 10 results in {1, 2, 5, 10}. There are only 4 factors and p = 5, therefore 0 is returned as the answer.

Sample Case 2

Sample Input 2

1

1

Sample Output 2

1

Explanation 2

Factoring n = 1 results in {1}. The p = 1st factor of 1 is returned as the answer.

For example:

Input

Result

10

3

5

10

5

0

1

1

1

n1=int(input())

n2=int(input())

l=[]

for i in range(1,n1+1):

    if(n1%i==0):

        l.append(i)

if(n2>len(l)):

    print(0)

else:

    print(l[n2-1])

Ex. No. : 5.7

Merge List

Write a Python program to Zip two given lists of lists.

Input:

m : row size

n: column size

list1 and list 2 :  Two lists

Output

Zipped List : List which combined both list1 and list2

Sample test case

Sample input

2

2

1

3

5

7

2

4

6

8

Sample Output

[[1, 3, 2, 4], [5, 7, 6, 8]]

m = int(input())

n = int(input())

list1 = []

list2 = []

for i in range(m):

    sublist1 = []

    for j in range(n):

        value=int(input())

        sublist1.append(value)

    list1.append(sublist1)

for i in range(m):

    sublist2 = []

    for j in range(n):

        value=int(input())

        sublist2.append(value)

    list2.append(sublist2)

zipped\_list = []

for i in range(m):

    zipped\_list.append(list1[i] + list2[i])

print(zipped\_list)

Ex. No. : 5.8

Merge Two Sorted Arrays Without Duplication

Output is a merged array without duplicates.

Input Format

N1 - no of elements in array 1

Array elements for array 1

N2 - no of elements in array 2

Array elements for array2

Output Format

Display the merged array

Sample Input 1

5

1

2

3

6

9

4

2

4

5

10

Sample Output 1

      1 2 3 4 5 6 9 10

N1 = int(input())

array1 = [int(input()) for \_ in range(N1)]

N2 = int(input())

array2 = [int(input()) for \_ in range(N2)]

merged\_array = array1 + array2

merged\_array = list(set(merged\_array))

merged\_array.sort()

print(\*merged\_array)

Ex. No. : 5.9

Print Element Location

Write a program to print all the locations at which a particular element (taken as input) is found in a list and also print the total number of times it occurs in the list. The location starts from 1.

 For example, if there are 4 elements in the array:

5

6

5

7

If the element to search is 5 then the output will be:

5 is present at location 1

5 is present at location 3

5 is present 2 times in the array.

Sample Test Cases

Test Case 1

Input

4

5

6

5

7

5

Output

5 is present at location 1.

5 is present at location 3.

5 is present 2 times in the array.

Test Case 2

 Input

5

67

80

45

97

100

50

Output

50 is not present in the array.

n=int(input())

l=[]

for i in range (n):

    b=int(input())

    l.append(b)

n1=int(input())

count=0

for i in range(n):

    if (l[i]==n1):

        print("%d is present at location %d."%(n1,i+1))

        count+=1

if(count==0):

    print("%d is not present in the array."%(n1))

else:

    print("%d is present %d times in the array."%(n1,count))

Ex. No. : 5.10

Strictly increasing

Write a Python program to check if a given list is strictly increasing or not. Moreover, If removing only one element from the list results in a strictly increasing list, we still consider the list true

Input:

n : Number of elements

List1: List of values

Output

Print "True" if list is strictly increasing or decreasing else print "False"

Sample Test Case

Input

7

1

2

3

0

4

5

6

Output

True

def is\_strictly\_increasing\_or\_decreasing(l):

    n = len(l)

    if n == 1:

        return True

    flag = True

    for i in range(n-1):

        if (l[i] >= l[i+1]) == (i % 2 == 0):

            flag = False

            break

    return flag

def is\_strictly\_increasing(l):

    n = len(l)

    if n == 1:

        return True

    for i in range(n-1):

        if l[i] >= l[i+1]:

            return False

    return True

def is\_strictly\_decreasing(l):

    n = len(l)

    if n == 1:

        return True

    for i in range(n-1):

        if l[i] <= l[i+1]:

            return False

    return True

n = int(input())

List1 = [int(input()) for \_ in range(n)]

if is\_strictly\_increasing\_or\_decreasing(List1):

    print("True")

else:

    for i in range(n):

        new\_list = List1[:i] + List1[i+1:]

        if is\_strictly\_increasing(new\_list) or is\_strictly\_decreasing(new\_list):

            print("True")

            break

    else:

        print("False")