**Week6**

1,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.

Sample Case 0

Sample Input 0

4

1

2

3

3

Sample Output 0

2

Explanation 0

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

·         Using zero based indexing, arr[2]=3 is the pivot between the two subarrays.

·         The index of the pivot is 2.

Sample Case 1

Sample Input 1

3

1

2

1

Sample Output 1

1

Explanation 1

·         The first and last elements are equal to 1.

·         Using zero based indexing, arr[1]=2 is the pivot between the two subarrays.

·         The index of the pivot is 1.

**For example:**

| **Input** | **Result** |
| --- | --- |
| 4  1  2  3  3 | 2 |
| 3  1  2  1 | 1 |

**Program:**

**n = int(input())**

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

**total\_sum = sum(arr)**

**left\_sum = 0**

**for i, num in enumerate(arr):**

**total\_sum -= num**

**if left\_sum == total\_sum:**

**print(i)**

**break**

**left\_sum += num**

**else:**

**print(-1)**

**output:**

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 4  1  2  3  3 | 2 | 2 |  |
|  | 3  1  2  1 | 1 | 1 |  |

Passed all tests!

**2,** 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

**Program:**

**N1 = int(input())**

**array1 = set(int(input()) for \_ in range(N1))**

**N2 = int(input())**

**array2 = set(int(input()) for \_ in range(N2))**

**merged\_array = sorted(array1.union(array2))**

**print(\*merged\_array)**

**output:**

| **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- |
|  | 5  1  2  3  6  9  4  2  4  5  10 | 1 2 3 4 5 6 9 10 | 1 2 3 4 5 6 9 10 |  |
|  | 7  4  7  8  10  12  30  35  9  1  3  4  5  7  8  11  13  22 | 1 3 4 5 7 8 10 11 12 13 22 30 35 | 1 3 4 5 7 8 10 11 12 13 22 30 35 |  |

Passed all tests!

**3**

Correct

Mark 1.00 out of 1.00

Flag question

Question text

Find the intersection of two sorted arrays.

OR in other words,

Given 2 sorted arrays, find all the elements which occur in both the arrays.

Input Format

The first line contains T, the number of test cases. Following T lines contain:

1.      Line 1 contains N1, followed by N1 integers of the first array

2.      Line 2 contains N2, followed by N2 integers of the second array

Output Format

The intersection of the arrays in a single line

Example

Input:

1

3 10 17 57

6 2 7 10 15 57 246

Output:

10 57

Input:

1

7

1

2

3

3

4

5

6

2

1

6

Output:

1 6

**For example:**

| **Input** | **Result** |
| --- | --- |
| 1  3  10  17  57  6  2  7  10  15  57  246 | 10 57 |
| 1  7  1  2  3  3  4  5  6  2  1  6 | 1 6 |

Program:

**def intersection(l1,l2):**

**l3=[value for value in l1 if value in l2]**

**return l3**

**n=int(input())**

**for i in range(0,n):**

**s1=int(input())**

**l1=[]**

**for x in range(0,s1):**

**e1=int(input())**

**l1.append(e1)**

**s2=int(input())**

**l2=[]**

**for y in range(0,s2):**

**e2=int(input())**

**l2.append(e2)**

**print(\*intersection(l1,l2))**

**output:**

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 1  3  10  17  57  6  2  7  10  15  57  246 | 10 57 | 10 57 |  |
|  | 1  7  1  2  3  3  4  5  6  2  1  6 | 1 6 | 1 6 |  |

Passed all tests!

Question **4**

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 |

**PROGRAM:**

**l=[]**

**n=int(input())**

**for i in range(0,n):**

**e=int(input())**

**l.append(e)**

**print(\*set(l))**

**OUTPUT:**

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 5  1  2  2  3  4 | 1 2 3 4 | 1 2 3 4 |  |
|  | 6  1  1  2  2  3  3 | 1 2 3 | 1 2 3 |  |

Passed all tests!

### Question 5

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

PROGRAM:

def count\_frequency(arr):

frequency = {}

for num in arr:

frequency[num] = frequency.get(num, 0) + 1

for num, freq in frequency.items():

print(num, "occurs", freq, "times")

n = int(input())

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

OUPUT:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 7  23  45  23  56  45  23  40 | 23 occurs 3 times  45 occurs 2 times  56 occurs 1 times  40 occurs 1 times | 23 occurs 3 times  45 occurs 2 times  56 occurs 1 times  40 occurs 1 times |  |

Passed all tests!

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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 Test Cases

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

PROGRAM:

l=[]

for i in range(0,10):

e=int(input())

l.append(e)

a=int(input())

print("ITEM to be inserted:{:d}".format(a))

print("After insertion array is:")

l.append(a)

l.sort()

for j in range(0,11):

print(l[j])

#### OUTPUT:

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 1  3  4  5  6  7  8  9  10  11  2 | ITEM to be inserted:2  After insertion array is:  1  2  3  4  5  6  7  8  9  10  11 | ITEM to be inserted:2  After insertion array is:  1  2  3  4  5  6  7  8  9  10  11 |  |
|  | 11  22  33  55  66  77  88  99  110  120  44 | ITEM to be inserted:44  After insertion array is:  11  22  33  44  55  66  77  88  99  110  120 | ITEM to be inserted:44  After insertion array is:  11  22  33  44  55  66  77  88  99  110  120 |  |

Passed all tests!

### Question 7

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

PROGRAM:

n = int(input(""))

list1 = [int(input()) for \_ in range(n)]

def is\_strictly\_increasing(lst):

count = 0

for i in range(1, len(lst)):

if lst[i] <= lst[i - 1]:

count += 1

if count > 1:

return False

if i == 1 or lst[i] > lst[i - 2]:

continue

elif i < len(lst) - 1 and lst[i + 1] > lst[i - 1]:

continue

else:

return False

return True

def is\_strictly\_decreasing(lst):

reversed\_lst = lst[::-1]

return is\_strictly\_increasing(reversed\_lst)

if is\_strictly\_increasing(list1) or is\_strictly\_decreasing(list1):

print("True")

else:

print("False")

#### OUTPUT:

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 7  1  2  3  0  4  5  6 | True | True |  |
|  | 4  2  1  0  -1 | True | True |  |

Passed all tests!

### Question 8

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.

PROGRAM:

l=[]

n=int(input())

for i in range(0,n):

e=int(input())

l.append(e)

p=int(input())

c=0

for j in range(0,n):

if(p==l[j]):

print(p,"is present at location {:d}.".format(j+1))

c+=1

if(c==0):

print(p,"is not present in the array.")

else:

print(p,"is present {:d} times in the array.".format(c))

#### OUTPUT:

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 4  5  6  5  7  5 | 5 is present at location 1.  5 is present at location 3.  5 is present 2 times in the array. | 5 is present at location 1.  5 is present at location 3.  5 is present 2 times in the array. |  |
|  | 5  67  80  45  97  100  50 | 50 is not present in the array. | 50 is not present in the array. |  |

Passed all tests!

### Question 9

Given two lists A and B, and B is an anagram of A. B is an anagram of A means B is made by randomizing the order of the elements in A.

We want to find an *index mapping* P, from A to B. A mapping P[i] = j means the ith element in A appears in B at index j.

These lists A and B may contain duplicates. If there are multiple answers, output any of them.

For example, given

**Input**

5

12 28 46 32 50

50 12 32 46 28

**Output**

1 4 3 2 0

**Explanation**

A = [12, 28, 46, 32, 50]

B = [50, 12, 32, 46, 28]

We should return

[1, 4, 3, 2, 0]

as P[0] = 1 because the 0th element of A appears at B[1], and P[1] = 4 because the 1st element of A appears at B[4], and so on.

PROGRAM:

n = int(input())

A = list(map(int, input().split()))

B = list(map(int, input().split()))

mapping = {num: i for i, num in enumerate(B)}

result = [mapping[num] for num in A]

print(\*result)

#### OUTPUT:

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 5  12 28 46 32 50  50 12 32 46 28 | 1 4 3 2 0 | 1 4 3 2 0 |  |

Passed all tests!

### Question 10

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.

Example

Input

1

3

1

3

5

4

Output:

1

Input

1

3

1

3

5

99

Output

0

**For example:**

| **Input** | **Result** |
| --- | --- |
| 1  3  1  3  5  4 | 1 |
| 1  3  1  3  5  99 | 0 |

PROGRAM:

t=int(input())

for i in range(0,t):

l=[]

n=int(input())

for i in range(0,n):

e=int(input())

l.append(e)

k=int(input())

c=0

for i in range(0,n):

for j in range(0,n):

if(i!=j and (l[i]-l[j]==k or l[j]-l[i]==k)):

c=1

if(c==0):

print("0")

else:

print("1")

#### OUTPUT:

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 1  3  1  3  5  4 | 1 | 1 |  |
|  | 1  3  1  3  5  99 | 0 | 0 |  |

Passed all tests!

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