RAJALAKSHMI ENGINEERING COLLEGE
An AUTONOMOUS Institution
Affiliated to ANNA UNIVERSITY, Chennai

REC-OCATS-1

CS23336-Introduction to Python Programming

Started on	Tuesday, 22 October 2024, 11:18 AM
State	Finished
Completed on	Tuesday, 22 October 2024, 5:28 PM
Time taken	6 hours 10 mins
Marks	10.00/10.00
Grade	**100.00** out of 100.00

Question 1

Correct
Mark 1.00 out of 1.00
☐ Flag question

Question text

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
Answer:(penalty regime: 0 %)

```
n=int(input())
lis=[]
set1={}
for i in range(n):
    a=int(input())
    lis.append(a)
for i in lis:
    if i in set1:
        set1[i]+=1
    else:
        set1[i]=1
for i in set1:

print(i,"occurs",set1[i],
"times")
```

Feedback

Input	Expected	Got
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!

Correct
Marks for this submission: 1.00/1.00.

Question 2

Correct
Mark 1.00 out of 1.00
☐ Flag question

Question text

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

Answer:(penalty regime: 0 %)

```
a=int(input())
p=[]
for i in range(a):
    x=int(input())
    p.append(x)
res=sorted(set(p))
print(*res)
```

Feedback

Input	Expected	Got
5 1 2 2 3 4	1 2 3 4	1 2 3 4
6		

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

Passed all tests!

Correct
Marks for this submission: 1.00/1.00.

Question 3

Correct
Mark 1.00 out of 1.00
Flag question

Question text

The program must accept **N** integers and an integer **K** as the input. The program must print every K integers in descending order as the output.

–

Note: If **N % K != 0**, then sort the final N%K integers in descending order.

Boundary Condition(s):

1 <= N <= 10^4
-99999 <= Array Element Value <= 99999

Input Format:

The first line contains the values of N and K separated by a space.
The second line contains N integers separated by space(s).

Output Format:

The first line contains N integers.

Example Input/Output 1:

Input:

7 3
48 541 23 68 13 41 6

Output:

541 48 23 68 41 13 6

Explanation:

The first three integers are 48 541 23, after sorting in descending order the integers are **541 48 23**.
The second three integers are 68 13 41, after sorting in descending order the integers are **68 41 13**.
The last integer is **6**.
The integers are **541 48 23 68 41 13 6**

Hence the output is **541 48 23 68 41 13 6**.

Answer:(penalty regime: 0 %)

```
import re
res=[]
a=input()
lis=re.findall(r'[0-
9]+',a)
a=input()
integers=re.findall(r'
[0-9]+',a)
split=len(integers)//i
nt(lis[1])
x=0
for i in range(split):

temp=integers[x:x+i
nt(lis[1])]

temp.sort(reverse=T
rue)
```

Feedback

Input	Expected	Got
7 3 48 541 23 68 13 41 6	541 48 23 68 41 13 6	541 48 23 68 41 13 6

Passed all tests!

Correct
Marks for this submission: 1.00/1.00.

Question 4

Correct
Mark 1.00 out of 1.00
☐ Flag question

Question text

Assume you have an array of length ***n*** initialized with all **0**'s and are given ***k*** update operations.

Each operation is represented as a triplet: **[startIndex, endIndex, inc]** which increments each element of subarray **A[startIndex ... endIndex]** (startIndex and endIndex inclusive) with **inc**.

Return the modified array after all ***k*** operations were executed.

Example:

Input:

5

3

1 3 2

2 4 3

0 2 -2

Output:

-2 0 3 5 3

Explanation:

Initial state:

length = 5, updates = [[1,3,2],[2,4,3],[0,2,-2]]

[0,0,0,0,0]

After applying operation [1,3,2]:

[0,2,2,2,0]

After applying operation [2,4,3]:

[0,2,5,5,3]

After applying operation [0,2,-2]:

[-2,0,3,5,3]

Answer:(penalty regime: 0 %)

```
n=int(input())
k=int(input())
arr=[0]*(n+1)
for _ in range(k):

s,e,inc=map(int,input(
).split())
    arr[s]+=inc
    if e+1<n:
        arr[e+1]-=inc
for i in range(1,n):
    arr[i]+=arr[i-1]
print('
'.join(map(str,arr[:n])))
```

Feedback

Input	Expected	Got
5 3 1 3 2 2 4 3 0 2 -2	-2 0 3 5 3 -2 0 3 5 3	-2 0 3 5 3 -2 0 3 5 3

Passed all tests!

Correct
Marks for this submission: 1.00/1.00.

Question 5

Correct
Mark 1.00 out of 1.00
☐ Flag question

Question text

An array is monotonic if it is either **monotone increasing** or **monotone decreasing**.
An array A is monotone increasing if for all i <= j, **A[i] <= A[j]**. An array A is monotone decreasing if for all i <= j, **A[i] >= A[j]**.

Write a program if n array is monotonic or not. Print "True" if is monotonic or "False" if it is not. Array can be monotone increasing or decreasing.

Input Format:

First line n-get number of elements

Next n Lines is the array of elements

Output Format:

True ,if array is monotone increasing or decreasing.

otherwise False is printed

Sample Input1

4

5

6

7

8

Sample Output1

True

Sample Input2

4

6

5

4

3

Sample Output2

True

Sample Input 3

4

6

7

8

7

Sample Output3

False

For example:

Input	Result
4 6 5 4 3	True

Answer:(penalty regime: 0 %)

```
n=int(input())
lis=[]
flag=0
for i in range(n):
    x=int(input())
    lis.append(x)
diff=(lis[0]-lis[1])
if diff<0:
    for i in range(n-1):
        if (lis[i]
<lis[i+1]):
            flag+=1
elif diff>0:
    for i in range(n-1):
        if lis[i]>lis[i+1]:
            flag+=1
if flag==n-1:
    print("True")
```

Feedback

Input	Expected	Got
4 6 5 4 3	True	True
4 3 5 7 4	False	False
4 1 6 9 2	False	False
4 9 6 4 2	True	True
3 2 1 4	False	False

Passed all tests!

Correct
Marks for this submission: 1.00/1.00.

Question 6

Correct
Mark 1.00 out of 1.00
☐ Flag question

Question text

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

Example

n = 20

p = 3

The factors of 20 in ascending order are {1, 2, 4, 5, 10, 20}. Using 1-based indexing, if p = 3, then 4 is returned. If p > 6, 0 would be returned.

Constraints

$1 \leq n \leq 10^{15}$

$1 \leq p \leq 10^{9}$

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

Answer:(penalty regime: 0 %)

```
n=int(input())
p=int(input())
lis=[]
for i in range(1,n+1):
    if n%i==0:
        lis.append(i)
if p<=len(lis):
    print(lis[p-1])
else:
    print(0)
```

Feedback

Input	Expected	Got
10 3	5	5
10 5	0	0
1 1	1	1

Passed all tests!

Correct
Marks for this submission: 1.00/1.00.

Question 7

Correct
Mark 1.00 out of 1.00
☐ Flag question

Question text

Given a matrix mat where every row is sorted in **strictly increasing** order, return the **smallest common element** in all rows.

If there is no common element, return -1.

Example 1:

Input:

4 5

1 2 3 4 5

2 4 5 8 10

3 5 7 9 11

1 3 5 7 9

Output:

5

Constraints:

- 1 <= mat.length, mat[i].length <= 500
- 1 <= mat[i][j] <= 10^4
- mat[i] is sorted in strictly increasing order.

Answer:(penalty regime: 0 %)

```
rows,col=map(int,in
put().split())
matrix=
[list(map(int,input().
split()))for _ in
range(rows)]

count={}
for elem in
matrix[0]:
    count[elem]=1
for i in
range(1,rows):
    for elem in
matrix[i]:
        if elem in count
and count[elem]==i
+ 1 - 1:
```

Feedback

Input	Expected	Got
4 5 1 2 3 4 5 2 4 5 8 10 5 3 5 7 9 11 1 3 5 7 9	5	5

Passed all tests!

Correct
Marks for this submission: 1.00/1.00.

Question 8

Correct
Mark 1.00 out of 1.00
☐ Flag question

Question text

Given an integer n, return an list of length n + 1 such that for each i (0 <= i <= n), ans[i] is the number of 1's in the binary representation of i.

Example:

Input: n = 2
Output: [0,1,1]
Explanation:
0 --> 0
1 --> 1
2 --> 10

Example2:

```
Input: n = 5
Output: [0,1,1,2,1,2]
Explanation:
0 --> 0
1 --> 1
2 --> 10
3 --> 11
4 --> 100
5 --> 101
```

Note: Complete the given function alone

For example:

Test	Result
`print(CountingBits(5))`	`[0, 1, 1, 2, 1, 2]`

Answer:(penalty regime: 0 %)

```
def CountingBits(n):
    lis=[]
    for i in range(n+1):
        s=0
        while i>0:
            x=i%2
            s+=x
            i//=2
        lis.append(s)
    return lis
```

Reset answer

Feedback

Test	Expected	Got
`print(CountingBits(2))`	`[0, 1, 1]`	`[0, 1, 1]`
`print(CountingBits(5))`	`[0, 1, 1, 2, 1, 2]`	`[0, 1, 1, 2, 1, 2]`

Passed all tests!

Correct
Marks for this submission: 1.00/1.00.

Question 9

Correct
Mark 1.00 out of 1.00
☐ Flag question

Question text

Given two arrays of positive integers, for each element in the second array, find the total number of elements in the first array which are *less than or equal to* that element. Store the values determined in an array.

For example, if the first array is *[1, 2, 3]* and the second array is *[2, 4]*, then there are *2* elements in the first array *less than or equal to 2.* There are *3* elements in the first array which are *less than or equal to 4*. We can store these answers in an array, *answer = [2, 3]*.

Program Description

The program must return an array of *m* positive integers, one *for each maxes[i]* representing the total number of elements *nums[j]* satisfying *nums[j] ≤ maxes[i]* where *0 ≤ j < n* and *0 ≤ i < m,* in the given order.

The program has the following:

nums[nums[0],...nums[n-1]]: first array of positive integers
maxes[maxes[0],...maxes[n-1]]: second array of positive integers

Constraints

- $2 \le n, m \le 10^5$
- $1 \le nums[j] \le 10^9$, where $0 \le j < n$.
- $1 \le maxes[i] \le 10^9$, where $0 \le i < m$.

Input Format For Custom Testing

Input from stdin will be processed as follows and passed to the program.

The first line contains an integer *n*, the number of elements in *nums*.
The next *n* lines each contain an integer describing *nums[j]* where $0 \le j < n$.
The next line contains an integer *m*, the number of elements in *maxes*.
The next *m* lines each contain an integer describing *maxes[i]* where $0 \le i < m$.

Sample Case 0

Sample Input 0

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

Sample Output 0

```
2
4
```

Explanation 0

We are given $n = 4$, $nums = [1, 4, 2, 4]$, $m = 2$, and $maxes = [3, 5]$.

1. For $maxes[0] = 3$, we have 2 elements in $nums$ ($nums[0] = 1$ and $nums[2] = 2$) that are $\le maxes[0]$.
2. For $maxes[1] = 5$, we have 4 elements in $nums$ ($nums[0] = 1$, $nums[1] = 4$, $nums[2] = 2$, and $nums[3] = 4$) that are $\le maxes[1]$.

Thus, the program returns the array $[2, 4]$ as the answer.

Sample Case 1

Sample Input 1

```
5
2
10
5
4
8
4
3
1
7
8
```

Sample Output 1

1
0
3
4

Explanation 1

We are given, *n = 5*, *nums = [2, 10, 5, 4, 8]*, *m = 4*, and *maxes = [3, 1, 7, 8]*.
1. For *maxes[0] = 3*, we have *1* element in *nums* (*nums[0] = 2*) that is ≤ *maxes[0]*.
2. For *maxes[1] = 1*, there are *0* elements in *nums* that are ≤ *maxes[1]*.
3. For *maxes[2] = 7*, we have *3* elements in *nums* (*nums[0] = 2*, *nums[2] = 5*, and *nums[3] = 4*) that are ≤ *maxes[2]*.
4. For *maxes[3] = 8*, we have *4* elements in *nums* (*nums[0] = 2*, *nums[2] = 5*, *nums[3] = 4*, and *nums[4] = 8*) that are ≤ *maxes[3]*.

Thus, the program returns the array *[1, 0, 3, 4]* as the answer.
Answer:(penalty regime: 0 %)

```
num=[]
maxe=[]
res=[]
a=int(input())
for i in range(a):
    x=int(input())
    num.append(x)
b=int(input())
for i in range(b):
    x=int(input())
    maxe.append(x)
for i in maxe:
    s=0
    for j in num:
        if i>=j:
            s+=1
    res.append(s)
print(*res,sep="\n")
```

Feedback

Input	Expected	Got
4 1 4 2 4 2 3 5	2 4	2 4
5 2 10 5 4 8 4 3 1 7 8	1 0 3 4	1 0 3 4

Passed all tests!

Correct
Marks for this submission: 1.00/1.00.

Question 10

Correct
Mark 1.00 out of 1.00
☐ Flag question

Question text

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

Answer:(penalty regime: 0 %)

```
T=int(input())
for test in range(T):
    n=int(input())
    a=[int(input()) for _
in range(n)]
    k=int(input())
    res=0
    for i in range(n):
        for j in range(n):
            if i!=j:
                d=a[i]-a[j]
                if d==k:
                    res=1
    print(res)
```

Feedback

Input	Expected	Got
1 3 1 3 5 4	1	1
1 3 1 3 5 99	0	0

Passed all tests!

Correct
Marks for this submission: 1.00/1.00.

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