



CS23336-Introduction to Python Programming

Started on Friday, 18 October 2024, 7:40 PM

State Finished

Completed on Friday, 18 October 2024, 11:10 PM

Time taken 3 hours 30 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

An array is monotonic if it is either **monotone increasing** or **monotone decreasing**.

An array A is monotone increasing if for all $i \leq j$, $A[i] \leq A[j]$. An array A is monotone decreasing if for all $i \leq j$, $A[i] \geq A[j]$.

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	True
4	
3	

Answer:(penalty regime: 0 %)

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

arr.append(int(input(
)))
def mono(array):
    inc=dec=True
    for i in
range(1,len(array)):
        if array[i]
<array[i-1]:
            inc=False
        if
array[i]>array[i-1]:
            dec=False
    return "True" if
inc or dec else
```

Feedback

Input Expected Got

4		
6		
5	True	True
4		
3		
4		
3		
5	False	False
7		
4		
4		
1		
6	False	False
9		
2		
4		
9		
6	True	True
4		
2		

3
2
1 False False
4

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

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):
    ans=[0]*(n+1)
    for i in
range(1,n+1):

ans[i]=ans[i>>1]+
(i&1)
    return ans
```

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 3

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 %)

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

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

Feedback

Input Expected Got

```
5
3
1 3 2  -2 0 3 5 3 -2 0 3 5 3
2 4 3
0 2 -2
```

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

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 $N \% K \neq 0$, then sort the final $N \% K$ integers in descending order.

Boundary Condition(s):

$1 \leq N \leq 10^4$
 $-99999 \leq \text{Array Element Value} \leq 99999$

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 %)

```
n,k=map(int,input().split())
arr=list(map(int,input().split()))
for i in range(0,n,k):
    chunk=arr[i:i+k]

    chunk.sort(reverse=True)
    print(*chunk,end=' ')
```

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 5

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	1 2 3 4
2	
3	
4	
6	
1	
1	
2	1 2 3
2	
3	
3	

Answer:(penalty regime: 0 %)

```
n=int(input())
array=[int(input())for
_ in range (n)]
ele=set(array)
print("
".join(map(str,ele)))
```

Feedback

Input Expected Got

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

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:

- $1 \leq \text{mat.length}, \text{mat}[i].\text{length} \leq 500$
- $1 \leq \text{mat}[i][j] \leq 10^4$
- $\text{mat}[i]$ 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	5	
3 5 7 9 11		
1 3 5 7 9		

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 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, $\text{answer} = [2, 3]$.

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 $nums[j] \leq maxes[i]$ where $0 \leq j < n$ and $0 \leq i < m$, in the given order.

The program has the following:

$nums[nums[0], \dots, nums[n-1]]$: first array of positive integers

$maxes[maxes[0], \dots, maxes[m-1]]$: second array of positive integers

Constraints

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

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 $0 \leq j < n$.

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 $0 \leq i < m$.

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 $\leq maxes[0]$.

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 $\leq maxes[1]$.

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
```

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 $\leq maxes[0]$.
2. For $maxes[1] = 1$, there are 0 elements in $nums$ that are $\leq maxes[1]$.
3. For $maxes[2] = 7$, we have 3 elements in $nums$ ($nums[0] = 2$, $nums[2] = 5$, and $nums[3] = 4$) that are $\leq maxes[2]$.
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 $\leq maxes[3]$.

Thus, the program returns the array $[1, 0, 3, 4]$ as the answer.

Answer:(penalty regime: 0 %)

```
n=int(input())
nums=[int(input()) for
_in range(n)]
m=int(input())
maxes=[int(input())for
_in range(m)]
res=[]
for max1 in maxes:
    count=0
    for num in nums:
        if num<=max1:
            count+=1
    res.append(count)
for count in res:
    print(count)
```

Feedback

Input Expected Got

4		
1		
4		
2	2	2
4	4	4
2		
3		
5		
5		
2		
10		
5		
4	1	1
4	0	0
8	3	3
4	4	4
3		
1		
7		
8		

Passed all tests!

Correct
Marks for this submission: 1.00/1.00.

Question 8

Correct
Mark 1.00 out of 1.00

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 $p = 3^{\text{rd}}$ 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 $p = 1^{\text{st}}$ 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())
def factor (num):
    fact=[]
    for i in
range(1,num+1):
    if num%i==0:
        fact.append(i)
    return fact
fact1=factor(n)
if p<=len(fact1):
    print(fact1[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 9

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 $A[i] - A[j] = k$, $i \neq j$.

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 1

3

5

4

1

3

1 0

3

5

99

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	1	1
3		
5		
4		

1		
3		
1	0	0
3		
5		
99		

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

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())
ele=[]
for _ in range(n):

ele.append(int(input()))
)
f={}
for n in ele:
    if n in f:
        f[n]+=1
    else:
        f[n]=1
for n,count in
f.items():
    print(f"{n} occurs
{count} times")
```

Feedback

Input	Expected	Got
7		
23		
45	23 occurs 3 times	23 occurs 3 times
23	45 occurs 2 times	45 occurs 2 times
56	56 occurs 1 times	56 occurs 1 times
45	40 occurs 1 times	40 occurs 1 times
23		
40		

Passed all tests!

Correct
Marks for this submission: 1.00/1.00.

Save the state of the flags

[Finish review](#)
[Skip Quiz navigation](#)

Quiz navigation

[Question 1 This page](#) [Question 2 This page](#) [Question 3 This page](#) [Question 4 This page](#) [Question 5 This page](#) [Question 6 This page](#) [Question 7 This page](#) [Question 8 This page](#) [Question 9 This page](#) [Question 10 This page](#) [Show one page at a time](#)[Finish review](#)