

CS23336-Introduction to Python Programming

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Completed on	Tuesday, 22 October 2024, 10:20 PM
Time taken	1 hour 37 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

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 %)

```
1 n=int(input())
2 k=int(input())
3 arr=[0]*(n+1)
4 for _ in range(k):
5     s,e,inc=map(int,input().split())
6     arr[s]+=inc
7     if e+1<n:
8         arr[e+1]-=inc
9 for i in range (1,n):
10     arr[i]+=arr[i-1]
11 print(' '.join(map(str,arr[:n])))
```

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 2

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 %)

```
1 rows,col=map(int,input().split())
2 matrix=[list(map(int,input().split())) for _ in range(rows)]
3
4 count={}
5 for elem in matrix[0]:
6     count[elem]=1
7 for i in range(1,rows):
8     for elem in matrix[i]:
9         if elem in count and count[elem]==i + 1 - 1:
10             count[elem]+=1
11 smallestcommonelement=1
12 for elem in matrix[0]:
13     if count.get(elem)==rows:
14         smallestcommonelement=elem
15         break
16 print(smallestcommonelement)
17
```

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 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 $N \% K \neq 0$, 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 %)

```
1 n,k=map(int,input().split())
2 arr=list(map(int,input().split()))
3 for i in range(0,n,k):
4     chunk=arr[i:i+k]
5     chunk.sort(reverse=True)
6     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 4

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 pth element of the list, sorted ascending. If there is no pth 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 5
3

10 0
5

1 1
1

Answer:(penalty regime: 0 %)

```
1 p=int(input())
2 p=int(input())
3 def factor (num):
4     fact=[]
5     for i in range(1,num+1):
6         if num%i==0:
7             fact.append(i)
8     return fact
9 fact1=factor(n)
10 if p<=len(fact1):
11     print(fact1[p-1])
12 else:
13     print(0)
```

Feedback

Input Expected Got

10 5 5
3

10 0 0
5

1 1 1
1

Passed all tests!

Correct
Marks for this submission: 1.00/1.00.

Question 5

Correct

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 $nums[j] \leq maxes[i]$ 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
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 $\leq maxes[0]$.
- 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 %)

```
1 n=int(input())
2 nums=[int(input()) for _ in range(n)]
3 m=int(input())
4 maxes=[int(input()) for _ in range(m)]
5 res=[]
6 for max1 in maxes:
7     count=0
8     for num in nums:
9         if num<=max1:
10             count+=1
11     res.append(count)
12 for count in res:
13     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
8	0	0
4	3	3

3 4 4
1
7
8

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

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 %)

```
1 n=int(input())
2 array=[int(input()) for _ in range(n)]
3 ele=set(array)
4 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 7

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 %)

```
1 n=int(input())
2 ele=[]
3 for _ in range(n):
4     ele.append(int(input()))
5 f={}
6 for n in ele:
7     if n in f:
8         f[n]+=1
9     else:
10        f[n]=1
11 for n,count in f.items():
12     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.

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 %)

Reset answer

```
1 def CountingBits(n):
2     ans=[0]*(n+1)
3     for i in range (1,n+1):
4         ans[i]=ans[i>>1]+(i&1)
5     return ans
```


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 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
3      0
5
99
```

Answer:(penalty regime: 0 %)

```
1 T=int(input())
2 for test in range (T):
3     n=int(input())
4     a=[int(input()) for _ in range(n)]
5     k=int(input())
6     res=0
7     for i in range (n):
8         for j in range(n):
9             if i!=j:
10                d=a[i]-a[j]
11                if d==k:
12                    res=1
13 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

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

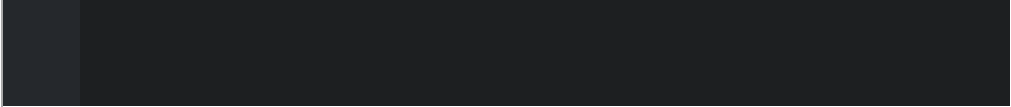
For example:

Input Result

```
4
6
5      True
4
3
```

Answer:(penalty regime: 0 %)

```
1  n=int(input())
2  arr=[]
3  for _ in range(n):
4      arr.append(int(input()))
5  def ismonotonic(array):
6      inc=dec=True
7      for i in range (1,len(array)):
8          if array[i]<array [i-1]:
9              inc=False
10         if array [i]>array[i-1]:
11             dec=False
12         return "True" if inc or dec else "False"
13  print(ismonotonic(arr))
```



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.
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