

# CS23336-Introduction to Python Programming

Started on	Monday, 21 October 2024, 10:08 PM
State	Finished
Completed on	Monday, 21 October 2024, 11:05 PM
Time taken	56 mins 35 secs
Marks	10.00/10.00
Grade	<b>100.00</b> out of 100.00

## Question 1

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  $p^{\text{th}}$  element of the list, sorted ascending. If there is no  $p^{\text{th}}$  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  $p = 1$ st 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 n=int(input())
2 p=int(input())
3 lis=[]
4 for i in range(1,n+1):
5     if n%i==0:
6         lis.append(i)
7 if p<=len(lis):
8     print(lis[p-1])
9 else:
10    print(0)
11
```

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 2

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 lis=[]
3 flag=0
4 for i in range(n):
5     x=int(input())
6     lis.append(x)
7 diff=(lis[0]-lis[1])
8 if diff<0:
9     for i in range(n-1):
10         if(lis[i]<lis[i+1]):
11             flag+=1
12 elif diff>0:
13     for i in range(n-1):
14         if(lis[i]>lis[i+1]):
15             flag+=1
16 if flag==n-1:
17     print("True")
18 else:
19     print("False")
20
```

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 3

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 lis=[]
3 set1={}
4 for i in range(n):
5     a=int(input())
6     lis.append(a)
7 for i in lis:
8     if i in set1:
9         set1[i]+=1
10    else:
11        set1[i]=1
12 for i in set1:
13     print(i,"occurs",set1[i],"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 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 4

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 %)

```
1 T=int(input())
2 for t in range(T):
3     n=int(input())
4     lis=[]
5     f=0
6     for i in range(n):
7         x=int(input())
8         lis.append(x)
9     k=int(input())
10    for i in range(n):
11        for j in range(n):
12            if (lis[i]-lis[j]==k):
13                print(1)
14                f=1
15                break
16    if f==0:
17        print(0)
18
```

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 5

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 import re
2 a=input()
3 row=int(a[0])
4 column=int(a[2])
5 matrix=[]
6 res=-1
7 for i in range(row):
8     temp=input()
9     matrix.append(re.findall(r'[0-9]+',temp))
10 for k in range(column):
11     x=(matrix[0])[k]
12     flag=0
13     for i in matrix:
14         if x in i:
15             flag+=1
16     if flag==row and res==-1:
17         res=x
18     elif flag==row and x<res:
19         res=x
20 print(res)
```

#### 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 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 a=int(input())
2 p=[]
3 for i in range(a):
4     x=int(input())
5     p.append(x)
6 res=sorted(set(p))
7 print(*res)
```

## 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

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:

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

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

### Constraints

- $2 \leq n, m \leq 10^5$
- $1 \leq \text{nums}[j] \leq 10^9$ , where  $0 \leq j < n$ .
- $1 \leq \text{maxes}[i] \leq 10^9$ , 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  $\text{nums}$ .  
The next  $n$  lines each contain an integer describing  $\text{nums}[j]$  where  $0 \leq j < n$ .  
The next line contains an integer  $m$ , the number of elements in  $\text{maxes}$ .  
The next  $m$  lines each contain an integer describing  $\text{maxes}[i]$  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  $n = 4$ ,  $\text{nums} = [1, 4, 2, 4]$ ,  $m = 2$ , and  $\text{maxes} = [3, 5]$ .

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

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 num=[]
2 maxe=[]
3 res=[]
4 a=int(input())
5 for i in range(a):
6     x=int(input())
7     num.append(x)
8 b=int(input())
9 for i in range(b):
10    x=int(input())
11    maxe.append(x)
12 for i in maxe:
13     s=0
14     for j in num:
15         if i>=j:
16             s+=1
17     res.append(s)
18 print(*res,sep="\n")
```

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 8

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 import re
2 n=int(input())
3 lis=[]
4 tes=[]
5 for i in range(n):
6     lis.append(0)
7 u=int(input())
8 for i in range(u):
9     a=input()
10    temp=re.findall(r'((-9)-0)+' ,a)
11    tes.append(temp)
12 for z in tes:
13     for i in range(int(z[0]),int(z[1])+1):
14         inc=int(z[2])
15         lis[i]+=inc
16 print(*lis)
```

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 9

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     lis=[]
3     for i in range(n+1):
4         s=0
5         while i>0:
6             x=i%2
7             s+=x
8             i//=2
9         lis.append(s)
10    return lis
```



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 10

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 %)

```
1 import re
2 res=[]
3 a=input()
4 lis=re.findall(r'[0-9]+',a)
5 a=input()
6 integers=re.findall(r'[0-9]+',a)
7 split=len(integers)//int(lis[1])
8 x=0
9 for i in range(split):
10     temp=integers[x:x+int(lis[1])]
11     temp.sort(reverse=True)
12     res.extend(temp)
13     x+=int(lis[1])
14 if split*int(lis[1])!= len(integers):
15     res.extend(integers[x:])
16 print(*res)
```

## 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.

[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](#)