.

06 - Strings in Python

**Department of Computer Science and Engineering** | **Rajalakshmi Engineering College**

111

**Ex. No. : 6.1 Date: 3.05.2024**

**Register No.: 231401037 Name: ILANKO M**

## Count Frequency

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

def count\_frequency(arr): freq\_dict = {}

for num in arr:

if num in freq\_dict: freq\_dict[num] += 1

else:

freq\_dict[num] = 1 return freq\_dict

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

.

.

112

arr = []

for \_ in range(n): arr.append(int(input()))

frequency\_dict = count\_frequency(arr)

for key, value in frequency\_dict.items(): print(f"{key} occurs {value} times")

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **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 |  |

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

. .

113

**Ex. No. : 6.2 Date: 3.05.2024**

**Register No.: 231401037 Name: ILANKO M**

## Non-duplicate elements

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 |

.

114

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

.

**def find\_intersection(arr1, arr2):**

**intersection = []**

**i, j = 0, 0**

**while i < len(arr1) and j < len(arr2):**

**if arr1[i] == arr2[j]:**

**intersection.append(arr1[i])**

**i += 1**

**j += 1**

**elif arr1[i] < arr2[j]:**

**i += 1**

**else:**

**j += 1**

**return intersection**

**# Input**

**T = int(input())**

**for \_ in range(T):**

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

**arr1= [int(input()) for i in range(N1)]**

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

**arr2 = [int(input()) for i in range(N2)]**

**# Output**

**intersection = find\_intersection(arr1, arr2)**

**print(\*intersection)**

|  |
| --- |
|  |
| **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 |  |  |

**Ex. No. : 6.3 Date: 3.05.2024**

**Register No.: 231401037 Name: ILANKO M**

## Merged array

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

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

.

116

.

def merge\_arrays(arr1, arr2):

set1 = set(arr1) set2 = set(arr2)

merged\_array = sorted(set1.union(se t2))

return merged\_array

def main(): try:

n1 = int(input()) arr1 =

[int(input()) for \_ in range(n1)]

n2 = int(input()) arr2 =

[int(input()) for \_ in range(n2)]

merged =merge\_arrays(arr1, arr2)

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

117

.

.

#### print(end="")

**for num in merged: print(num, end=" ")**

#### except ValueError: print()

**if name == " main ": main()**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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 |  |

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

. .

118

**Ex. No. : 6.4 Date: 3.05.2024**

**Register No.: 231401037 Name: ILANKO M**

# Sorted array

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

.

.

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College** 119

def insert\_into\_sorted\_array(arr, n, item): arr.append(0)

i = n - 1

while i >= 0 and arr[i] > item: arr[i+1] = arr[i]

i -= 1

arr[i+1] = item return arr

n = 10

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

arr = insert\_into\_sorted\_array(arr, n, item) print(f"ITEM to be inserted:{item}") print("After insertion array is:")

for element in arr: print(element)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **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 |  |

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

.

.

120

**Ex. No. : 6.5 Date: 3.05.2024**

**Register No.: 231401037 Name: ILANKO M**

# Deleting element in list

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

n = int(input())

List1 = list(map(int, input().split()))

def is\_strictly\_increasing(n, List1):

# Remove one element from the list and check if the remaining elements are strictly increasing for i in range(n):

new\_list = List1[:i] + List1[i+1:]

if is\_strictly\_increasing\_helper(new\_list): return True

# Check if the original list is strictly increasing return is\_strictly\_increasing\_helper(List1)

def is\_strictly\_increasing\_helper(List1): for i in range(len(List1) - 1):

if List1[i] >= List1[i+1]: return False

return True

.

.

121

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

# Check if the list is strictly decreasing if List1 == sorted(List1, reverse=True):

print("True")

elif is\_strictly\_increasing(n, List1): print("True")

else:

print("False")

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

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

. .

122

**Ex. No. : 6.6 Date: 3.05.2024**

**Register No.: 231401037 Name: ILANKO M**

# Repeated integers

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

def find\_pair\_with\_difference(arr, k): seen = set()

for i in range(len(arr)):

if (arr[i] - k) in seen or (arr[i] + k) in seen: return 1

seen.add(arr[i]) return 0

t = int(input()) for \_ in range(t):

n = int(input())

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

.

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

12

k = int(input())

result = find\_pair\_with\_difference(arr, k)

.

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

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

124

.

.

**x. No. : 6.7 Date: 3.05.2024**

**Register No.: 231401037 Name: ILANKO M**

### Pivot element

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.

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

.

125

Test Case 2

Input

5

67

80

45

97

100

50

Output

50 is not present in the array.

def find\_locations\_and\_count(lst, element):

locations = []

count = 0

for i, num in enumerate(lst, 1):

if num == element:

locations.append(i)

count += 1

if count > 0:

for loc in locations:

print(f"{element} is present at location {loc}.")

print(f"{element} is present {count} times in the array.")

else:

print(f"{element} is not present in the array.")

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

.

125

n = int(input().strip())

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

element = int(input().strip())

find\_locations\_and\_count(lst, element)

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

.

125

| **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. |  |

.

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

.

126

.

**Ex. No. : 6.8 Date: 3.05.2024**

**Register No.: 231401037 Name: ILANKO M**

**Zip List** Write a Python program to Zip two given lists of lists. Input:

m : row size n: column size

list1 and list 2 : Two lists Output

Zipped List : List which combined both list1 and list2

def zip\_lists\_user\_input(): m = int(input())

n = int(input())

list1 = [[int(input()) for \_ in range(n)] for \_ in range(m)] list2 = [[int(input()) for \_ in range(n)] for \_ in range(m)]

zipped\_list = [a + b for a, b in zip(list1, list2)] return zipped\_list

zipped\_result = zip\_lists\_user\_input() print(zipped\_result)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Input** | **Expected** | **Got** |  |
|  | 2  2  1  2  3  4  5  6  7  8 | [[1, 2, 5, 6], [3, 4, 7, 8]] | [[1, 2, 5, 6], [3, 4, 7, 8]] |  |

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

.

.

127

**Ex. No. : 6.9 Date: 3.05.2024**

**Register No.: 231401037 Name: ILANKO M**

### Factors of a number

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 ≤ n ≤ 1015

1 ≤ p ≤ 109

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

def find\_pth\_factor(n, p): factors = []

for i in range(1, n + 1): if n % i == 0:

factors.append(i) factors.sort()

if p <= len(factors): return factors[p - 1]

else:

return 0

def main(): try:

n = int(input()) p = int(input())

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

.

128

.

pth\_factor = find\_pth\_factor(n, p)

print(pth\_factor) except

ValueError:

print()

if name == " main ":

main()

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Input** | **Expected** | **Got** |  |
|  | 10  3 | 5 | 5 |  |
|  | 10  5 | 0 | 0 |  |
|  | 1  1 | 1 | 1 |  |

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

.

129

.

**Ex. No. : 6.10 Date: 3.05.2024**

**Register No.: 231401037 Name: ILANKO M**

### Index Mapping

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

def find\_mapping(A, B): mapping = {}

for i, num in enumerate(B): mapping[num] = i

return [mapping[num] for num in A]

if name == " main ": n

= int(input())

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

B = list(map(int, input().split())) mapping = find\_mapping(A, B) print(\*mapping)

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

**Department of Computer Science & Business Systems** | **Rajalakshmi Engineering College**

. .

130