**10 - Searching & Sorting**

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| **Ex. No. : 10.1** |  | **Date: 01.06.24** |
| **Register No.: 231901005** |  | **Name Akshay sing** |

# Bubble Sort

Bubble Sort is the simplest sorting algorithm that works by repeatedly swapping the adjacent elements if they are in wrong order. You read an list of numbers. You need to arrange the elements in ascending order and print the result. The sorting should be done using bubble sort.

Input Format: The frst line reads the number of elements in the array. The second line reads the array elements one by one.

Output Format: The output should be a sorted list.

**For example**:

Input

Result

6

3

4 8 7 1

2

1

2 3 4 7

8

5

4

5 2 3

1

1

2 3 4

5

**Program:**

n=int(input())

k=[int(x) for x in input().split()]

k.sort() for i in k:

print(i,end=' ')

**Ex. No. : 10.2 Date: 01.06.24**

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# Peak Element

Given an [list,](http://118.185.187.137/moodle/mod/resource/view.php?id=1068) fnd peak element in it. A peak element is an element that is greater than its neighbors.

An element a[i] is a peak element if

A[i-1] <= A[i] >=a[i+1] for middle elements. [0<i<n-1]

A[i-1] <= A[i] for last element [i=n-1]

A[i]>=A[i+1] for frst element [i=0]

**Input Format**

The frst line contains a single integer n , the length of A . The second line contains n space-separated integers,A[i].

**Output Format**

**Print** peak numbers separated by space.

**Sample Input**

5

8 9 10 2 6

**Sample Output**

10 6

**For example:**

**Input**

**Result**

4

12

8

**Input**

**Result**

12

3 6

8

**Program:**

a=int(input()) lst1=[str(x) for x in input().split(" ")] lst2=[] lst=[]

g=0

for i in lst1: if i.isdigit(): g=int(i) lst.append(g) for i in range(0,a): if(i==0): if(lst[i]>=lst[i+1]): lst2.append(lst[i]) elif(i>0 and i<a-2): if(lst[i]>=lst[i-1] and lst[i]>=lst[i+1]):

lst2.append(lst[i])

elif(i==a-1): if(lst[i]>=lst[i-1]): lst2.append(lst[i]) for i in lst2: print(i,end=" ")

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| **Ex. No. : 10.3** | **Date: 01.06.24** |
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# Merge Sort

Write a Python program to sort a list of elements using the merge sort algorithm.

**For example:**

**Input**

**Result**

5

6

5 4 3

8

3

4 5 6

8

**Program:**

def merge\_sort(arr): if len(arr) > 1:

mid = len(arr) // 2 left\_half = arr[:mid] right\_half = arr[mid:] merge\_sort(left\_half) merge\_sort(right\_half) i = j = k = 0 while i < len(left\_half) and j < len(right\_half): if left\_half[i] < right\_half[j]:

arr[k] = left\_half[i] i += 1 else: arr[k] = right\_half[j] j += 1 k += 1 while i < len(left\_half): arr[k] = left\_half[i] i += 1 k += 1 while j < len(right\_half): arr[k] = right\_half[j] j += 1 k += 1

def main():

n = int(input()) arr = list(map(int, input().split())) merge\_sort(arr) for num in arr:

print(num, end=" ")

if \_\_name\_\_ == "\_\_main\_\_":

main()

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| **Ex. No. : 10.4** | **Date: 01.06.24** |
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# Sum of Two numbers

An list contains N numbers and you want to determine whether two of the numbers sum to a given number K. For example, if the input is 8, 4, 1, 6 and K is 10, the answer is yes (4 and 6). A number may be used twice.

**Input Format**

The frst line contains a single integer n , the length of list The second line contains n space-separated integers, list[i].

The third line contains integer k.

**Output Format**

Print Yes or No.

**Sample Input**

7

0 1 2 4 6 5 3

1

**Sample Output** Yes

**For example:**

**Input**

**Result**

5

8

9 12 15

3

11

Yes

6

2

9 21 32 43 43

1

4

No

**Program:**

n=int(input()) a=[int(x) for x in input().split()] k=int(input()) flag=0 if len(a)!=n: print("No") flag=1 for i in a: for j in a:

if i+j==k and flag==0: flag=1 print("Yes")

break

if flag==0: print("No")

**Ex. No. : 10.5 Date: 01.06.24**

**Register No.: 231901005 Name: Akshay sing**

## Frequency of Elements

To fnd the frequency of numbers in a list and display in sorted order.

**Constraints:** 1<=n, arr[i]<=100 **Input:**

1 68 79 4 90 68 1 4 5

**output:**

1 2

1. 2
2. 1

68 2

79 1

90 1

**For example:**

**Input**

**Result**

4

3 5 3 4

5

3

2

4

2

5

2

**Program:**

lst5=[int(x) for x in input().split(" ")] lst=sorted(list(set(lst5)))

c=0 for i in lst: c=0 for j in lst5: if(i==j): c=c+1 print("%d %d"%(i,c))