WEEK 10-PYTHON PROGRAMMING

1.Given an list, find 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 first element [i=0]

Input Format

The first 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 3 6 8	12 8

Solution:

```
n=int(input())
s=input()
z=s.split()
l=[]

for i in range(0,n):
```

```
    if i==0:
        if int(z[i])>int(z[i+1]):
            l.append(int(z[i]))
        else:
            l.append(int(z[i+1]))
    elif i==n-1:
        if int(z[i])>int(z[i-1]) and int(z[i]) not in l:
            l.append(int(z[i]))
        elif int(z[i])<int(z[i-1]) and int(z[i-1]) not in l:
            l.append(int(z[i-1]))
    else:
        m=int(z[i-1])
        for j in range(i-1,i+2):
            if m<int(z[j]):
                m=int(z[j])
        if m not in l:
            l.append(m)

for i in l:
    print(i,end=' ')
```

2.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 first 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

Solution:

```
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")
```

3.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

Solution:

```
n=int(input())
a=[int(x) for x in input().split()]
a.sort()
for i in a:
    print(i,end=" ")
```

4.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 first 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

Solution:

```
n=int(input())
a=[int(x) for x in input().split()]
a.sort()
for i in a:
    print(i,end=" ")
```

5.Write a Python program for binary search.

For example:

Input Result
1,2,3,5,8
6
False
3,5,9,45,42
42
True

Solution:

```
a=input().split(",")
k=int(input())
flag=0
for i in a:
    if int(i)==k:
        flag+=1
if flag>0:
    print("True")
else:
    print("False")
```