Question **1**

Correct

Mark 1.00 out of 1.00

Flag question

Question text

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 |

Answer:(penalty regime: 0 %)

def binary\_search(arr, target):

left, right = 0, len(arr) - 1

while left <= right:

mid = left + (right - left) // 2

if arr[mid] == target:

return True

elif arr[mid] < target:

left = mid + 1

else:

right = mid - 1

return False

input\_list = sorted([int(x) for x in input().split(",")])

target\_value = int(input())

result = binary\_search(input\_list, target\_value)

print(result)

Feedback

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 1,2,3,5,8  6 | False | False |  |
|  | 3,5,9,45,42  42 | True | True |  |
|  | 52,45,89,43,11  11 | True | True |  |

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

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 |

Answer:(penalty regime: 0 %)

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

# Merge the two sorted halves

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

# Copy remaining elements of left\_half

while i < len(left\_half):

arr[k] = left\_half[i]

i += 1

k += 1

# Copy remaining elements of right\_half

while j < len(right\_half):

arr[k] = right\_half[j]

j += 1

k += 1

def print\_list(arr):

for num in arr:

print(num, end=' ')

print()

n = int(input())

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

merge\_sort(arr)

print\_list(arr)

Feedback

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 5  6 5 4 3 8 | 3 4 5 6 8 | 3 4 5 6 8 |  |
|  | 9  14 46 43 27 57 41 45 21 70 | 14 21 27 41 43 45 46 57 70 | 14 21 27 41 43 45 46 57 70 |  |
|  | 4  86 43 23 49 | 23 43 49 86 | 23 43 49 86 |  |

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

Given an listof integers, sort the array in ascending order using the *Bubble Sort* algorithm above. Once sorted, print the following three lines:

1.      List is sorted in numSwaps swaps., where numSwaps is the number of swaps that took place.

2.      First Element: firstElement, the  *first* element in the sorted list.

3.      Last Element: lastElement, the *last* element in the sorted list.

For example, given a worst-case but small array to sort: a=[6,4,1]. It took  3 swaps to sort the array. Output would be

Array is sorted in 3 swaps.

First Element: 1

Last Element: 6

**Input Format**

The first line contains an integer,n , the size of the list a .  
The second line contains  n,  space-separated integers a[i].

**Constraints**

·         2<=n<=600

·         1<=a[i]<=2x106.

**Output Format**

You must print the following three lines of output:

1.      List is sorted in numSwaps swaps., where numSwaps is the number of swaps that took place.

2.      First Element: firstElement, the  *first* element in the sorted list.

3.      Last Element: lastElement, the *last* element in the sorted list.

**Sample Input 0**

3

1 2 3

**Sample Output 0**

List is sorted in 0 swaps.

First Element: 1

Last Element: 3

**For example:**

| **Input** | **Result** |
| --- | --- |
| 3  3 2 1 | List is sorted in 3 swaps.  First Element: 1  Last Element: 3 |
| 5  1 9 2 8 4 | List is sorted in 4 swaps.  First Element: 1  Last Element: 9 |

Answer:(penalty regime: 0 %)

def bubble\_sort(arr):

n = len(arr)

num\_swaps = 0

for i in range(n):

for j in range(0, n-i-1):

if arr[j] > arr[j+1]:

arr[j], arr[j+1] = arr[j+1], arr[j]

num\_swaps += 1

return num\_swaps

# Read input

n = int(input())

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

# Sort the array using Bubble Sort and get the number of swaps

num\_swaps = bubble\_sort(arr)

# Print the required information

print("List is sorted in", num\_swaps, "swaps.")

print("First Element:", arr[0])

print("Last Element:", arr[-1])

Feedback

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 3  3 2 1 | List is sorted in 3 swaps.  First Element: 1  Last Element: 3 | List is sorted in 3 swaps.  First Element: 1  Last Element: 3 |  |
|  | 5  1 9 2 8 4 | List is sorted in 4 swaps.  First Element: 1  Last Element: 9 | List is sorted in 4 swaps.  First Element: 1  Last Element: 9 |  |

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

To find 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

 4 2

 5 1

 68 2

 79 1

90 1

**For example:**

| **Input** | **Result** |
| --- | --- |
| 4 3 5 3 4 5 | 3 2  4 2  5 2 |

Answer:(penalty regime: 0 %)

def frequency\_sorted(nums):

freq = {}

for num in nums:

freq[num] = freq.get(num, 0) + 1

sorted\_freq = sorted(freq.items())

for key, value in sorted\_freq:

print(key, value)

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

frequency\_sorted(nums)

Feedback

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 4 3 5 3 4 5 | 3 2  4 2  5 2 | 3 2  4 2  5 2 |  |
|  | 12 4 4 4 2 3 5 | 2 1  3 1  4 3  5 1  12 1 | 2 1  3 1  4 3  5 1  12 1 |  |
|  | 5 4 5 4 6 5 7 3 | 3 1  4 2  5 3  6 1  7 1 | 3 1  4 2  5 3  6 1  7 1 |  |

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

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

**For example:**

| **Input** | **Result** |
| --- | --- |
| 5  8 9 12 15 3  11 | Yes |
| 6  2 9 21 32 43 43 1  4 | No |

Answer:(penalty regime: 0 %)

n = int(input())

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

k = int(input())

arr.sort()

i = 0

j = n - 1

while i < j:

if arr[i] + arr[j] == k:

print("Yes")

exit()

elif arr[i] + arr[j] < k:

i += 1

else:

j -= 1

print("No")

Feedback

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 5  8 9 12 15 3  11 | Yes | Yes |  |
|  | 6  2 9 21 32 43 43 1  4 | No | No |  |
|  | 6  13 42 31 4 8 9  17 | Yes | Yes |  |

Passed all tests!

**Correct**

Marks for this submission: 1.00/1.00.