**PYTHON PROGRAM 1:**

**Python Program for Merge Sort.**

def merge(arr, l, m, r):

n1 = m - l + 1

n2 = r- m

L = [0] \* (n1)

R = [0] \* (n2)

for i in range(0 , n1):

L[i] = arr[l + i]

for j in range(0 , n2):

R[j] = arr[m + 1 + j]

i = 0

j = 0

k = l

while i < n1 and j < n2 :

if L[i] <= R[j]:

arr[k] = L[i]

i += 1

else:

arr[k] = R[j]

j += 1

k += 1

while i < n1:

arr[k] = L[i]

i += 1

k += 1

while j < n2:

arr[k] = R[j]

j += 1

k += 1

def mergeSort(arr,l,r):

if l < r:

m = (l+(r-1))//2

mergeSort(arr, l, m)

mergeSort(arr, m+1, r)

merge(arr, l, m, r)

arr = [12, 11, 13, 5, 6, 7]

n = len(arr)

print ("Given array is")

for i in range(n):

print ("%d" %arr[i]),

mergeSort(arr,0,n-1)

print ("\n\nSorted array is")

for i in range(n):

print ("%d" %arr[i]),

**OUTPUT:**

