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Aim – Write a Merge-Sort algorithm using the concept of Divide-and-Conquers to arrange the elements in ascending orders. Use all the operations of divide and conquers as functions.

Functions and Generators

Content:

Function Basics : def statement, definition and call, local variables

Function Scope: the LEGB rule, global statement, nested functions,

Function Arguments : passing arguments, special arguments,

Advanced Function Topics: Recursive Functions, Function objects, anonymous functions

Comprehensions and Generations : Generator functions and expressions

```
def merge_sort(a):
    if len(a)>1:
        print("spliiting list\n ",a)
        m=len(a)//2   #middle term
        #Dividing the elements
        left_tree=a[:m]
        right_tree=a[m:]
        merge_sort(left_tree)
        merge_sort(right_tree)
        i=j=temp=0
        while i < len(left_tree) and j < len(right_tree):
            if left_tree[i] < right_tree[j]:
                a[temp]=left_tree[i]
                i=i+1
            else:
                a[temp]=right_tree[j]
                j=j+1
            temp=temp+1
        while i < len(left_tree):
            a[temp]=left_tree[i]
            i=i+1
            temp=temp+1
        while j < len(right_tree):
            a[temp]=right_tree[j]
            j=j+1
            temp=temp+1
        print("merging List \n",a)


n=int(input("Enter no of Elements to be sorted\n"))
a=[]
for i in range(0,n):
```

```
    try:
        ele=int(input("enter number"))
        a.append(ele)
    except ValueError as Error:
        print("Enter a Number")
merge_sort(a)

print("sorted list:\n",a)
```

```
12
enter number54
enter number8
enter number8
enter number15
enter number0
enter number5
enter number8
enter number12
enter number2
enter number5
enter number88
enter number98
spliiting list
  [54, 8, 8, 15, 0, 5, 8, 12, 2, 5, 88, 98]
spliiting list
  [54, 8, 8, 15, 0, 5]
spliiting list
  [54, 8, 8]
spliiting list
  [8, 8]
merging List
 [8, 8]
merging List
 [8, 8, 54]
spliiting list
  [15, 0, 5]
spliiting list
  [0, 5]
merging List
 [0, 5]
merging List
 [0, 5, 15]
merging List
 [0, 5, 8, 8, 15, 54]
spliiting list
  [8, 12, 2, 5, 88, 98]
spliiting list
  [8, 12, 2]
spliiting list
  [12, 2]
merging List
 [2, 12]
merging List
 [2, 8, 12]
spliiting list

  [5, 88, 98]
```

```
spliiting list
  [88, 98]
merging List
 [88, 98]
merging List
 [5, 88, 98]
merging List
 [2, 5, 8, 12, 88, 98]
merging List
 [0, 2, 5, 5, 8, 8, 8, 12, 15, 54, 88, 98]
sorted list:
 [0, 2, 5, 5, 8, 8, 8, 12, 15, 54, 88, 98]
```