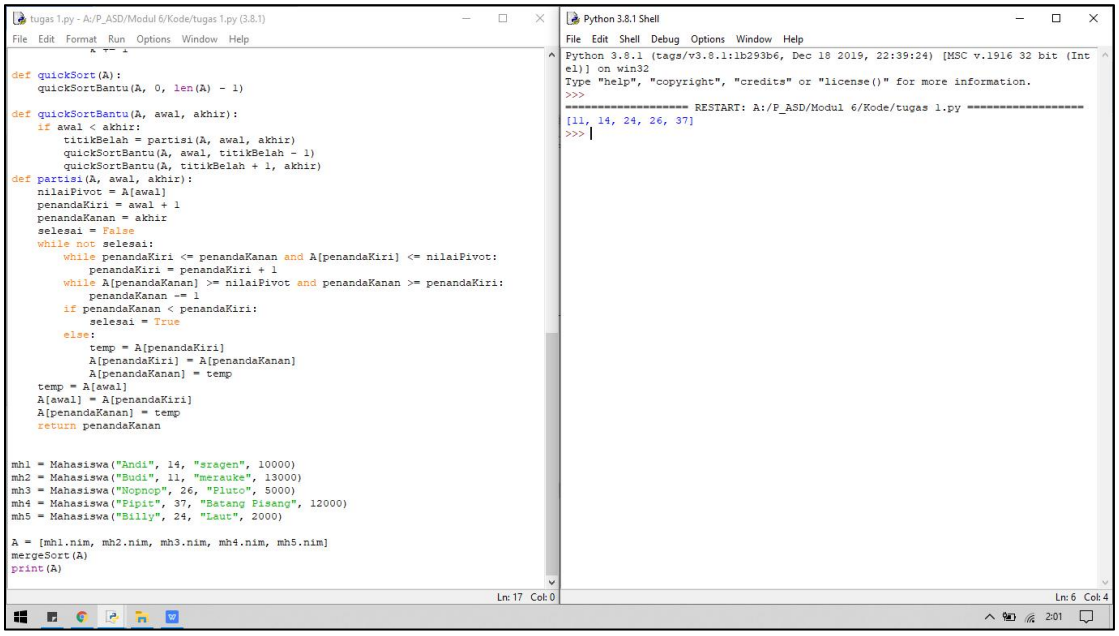
TUGAS PRAKTIKUM
ALGORITMA DAN STRUKTUR DATA
MODUL 6. PENGURUTAN LANJUT

6.4 Soal-soal untuk Mahasiswa

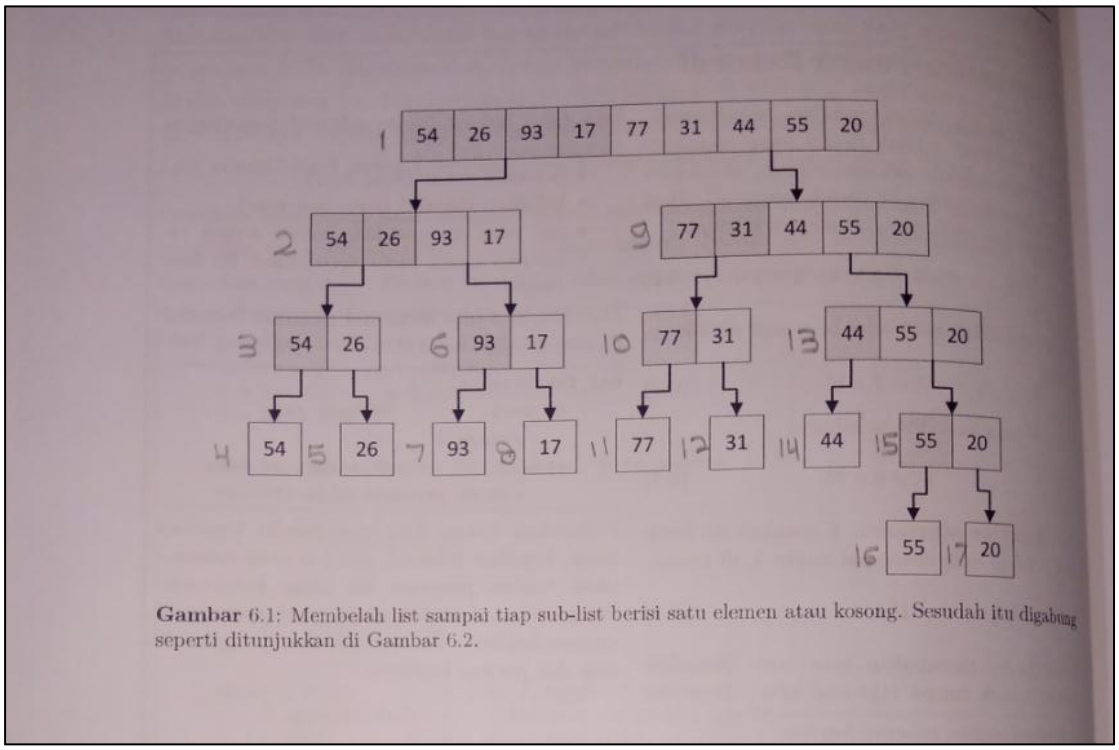
1.



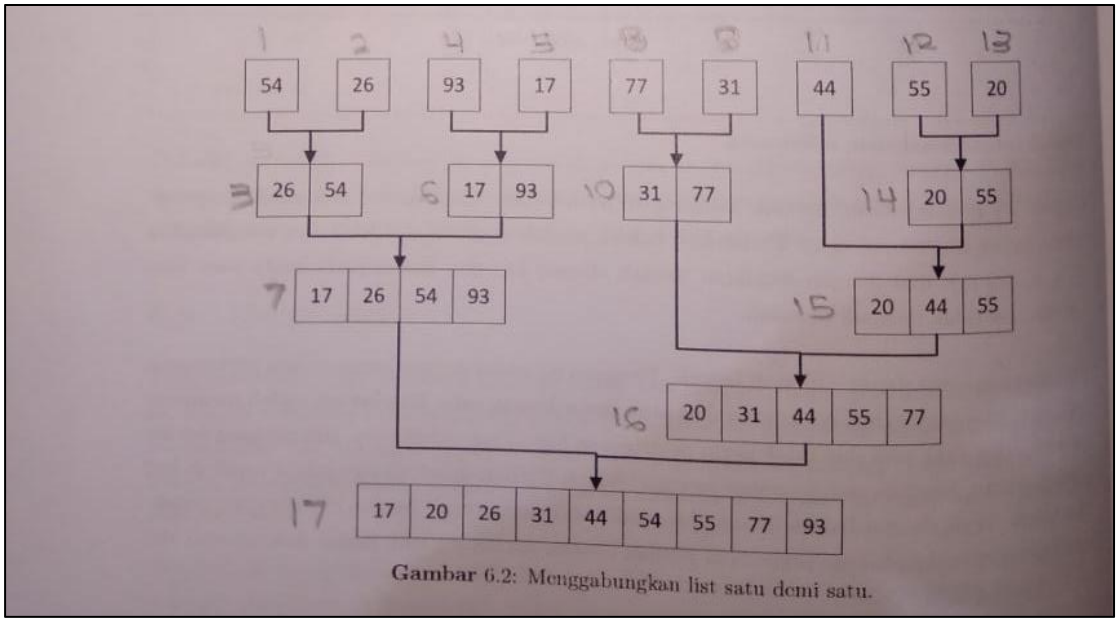
```
def quickSort(A):
    quickSortBantu(A, 0, len(A) - 1)

def quickSortBantu(A, awal, akhir):
    if awal < akhir:
        titikBelah = partisi(A, awal, akhir)
        quickSortBantu(A, awal, titikBelah - 1)
        quickSortBantu(A, titikBelah + 1, akhir)
def partisi(A, awal, akhir):
    nilaiPivot = A[awal]
    penandaKiri = awal + 1
    penandaKanan = akhir
    selesai = False
    while not selesai:
        while penandaKiri <= penandaKanan and A[penandaKiri] <= nilaiPivot:
            penandaKiri = penandaKiri + 1
        while A[penandaKanan] >= nilaiPivot and penandaKanan >= penandaKiri:
            penandaKanan -= 1
        if penandaKanan < penandaKiri:
            selesai = True
        else:
            temp = A[penandaKiri]
            A[penandaKiri] = A[penandaKanan]
            A[penandaKanan] = temp
    temp = A[awal]
    A[awal] = A[penandaKiri]
    A[penandaKanan] = temp
    return penandaKanan


mh1 = Mahasiswa("Andi", 14, "sragen", 10000)
mh2 = Mahasiswa("Budi", 11, "merauke", 13000)
mh3 = Mahasiswa("Nopnop", 26, "Pluto", 5000)
mh4 = Mahasiswa("Pipit", 37, "Batang Pisang", 12000)
mh5 = Mahasiswa("Billy", 24, "Laut", 2000)

A = [mh1.nim, mh2.nim, mh3.nim, mh4.nim, mh5.nim]
mergeSort(A)
print(A)
```

```
Python 3.8.1 (tags/v3.8.1:1b293b6, Dec 18 2019, 22:39:24) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: A:/P_ASD/Modul 6/Kode/tugas 1.py ==========
[11, 14, 24, 26, 37]
>>>
```

2.

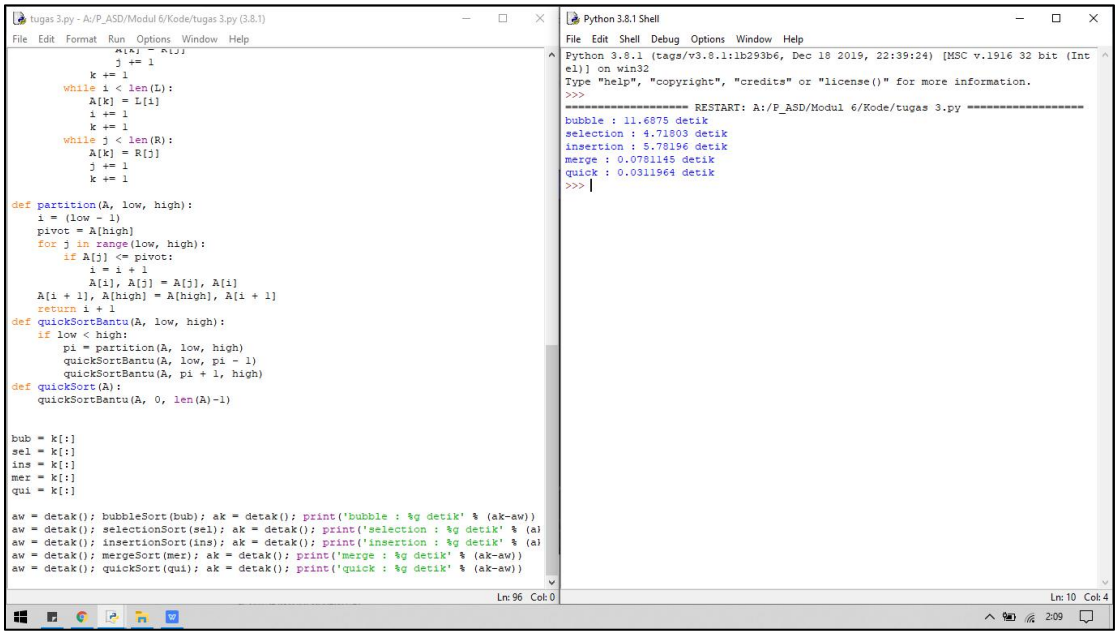


Gambar 6.1: Membelah list sampai tiap sub-list berisi satu elemen atau kosong. Sesudah itu digabung seperti ditunjukkan di Gambar 6.2.



Gambar 6.2: Menggabungkan list satu demi satu.

3.



4.

a.

80	7	24	16	43	91	35	2	19	72
7	80	16	24	43	91	2	35	19	72
7	16	24	80	2	35	43	91	19	72
2	7	16	24	35	43	80	91	19	72
2	7	16	19	24	35	43	72	80	91

b.

80	7	24	16	43	91	35	2	19	72

Pivot

80	7	24	16	43	91	35	2	19	72

Low High

Pivot

72	7	24	16	43	91	35	2	19	80

Low High

Pivot

72	7	24	16	43	91	35	2	19	72

Low Hight

Pivot

72	7	24	16	43	80	35	2	19	91

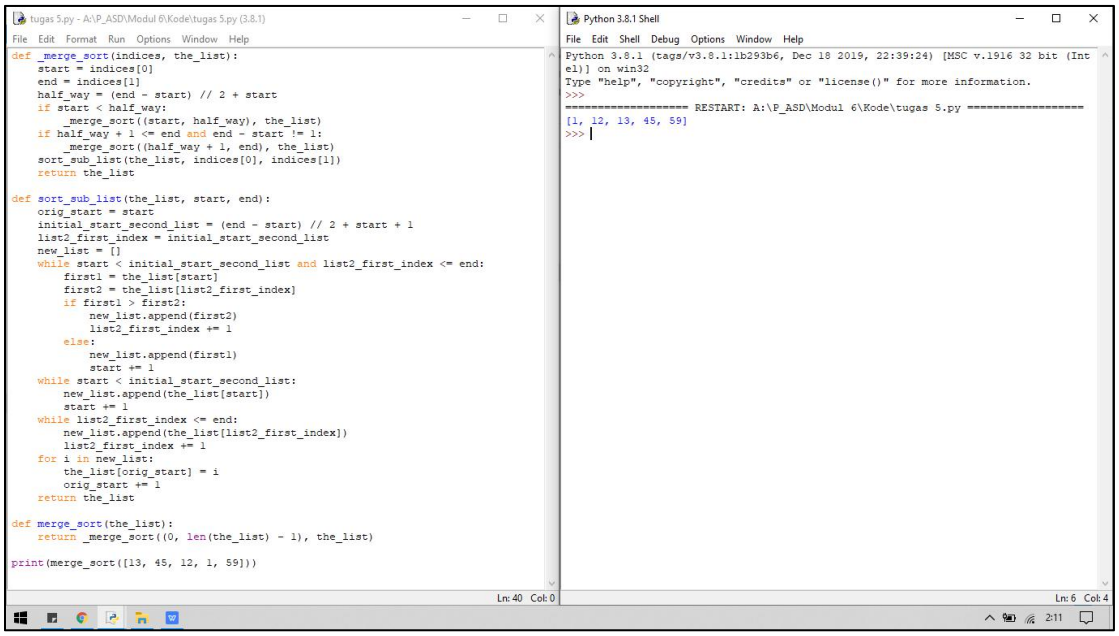
Low Hight

Pivot

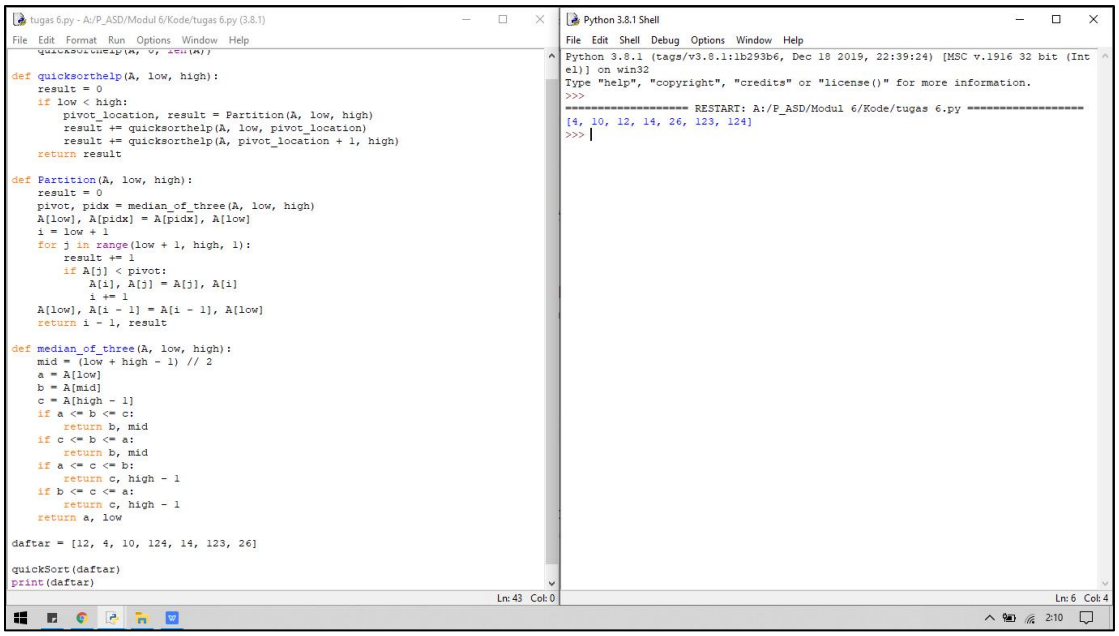
72	7	24	16	43	19	35	2	80	91

Low Hight

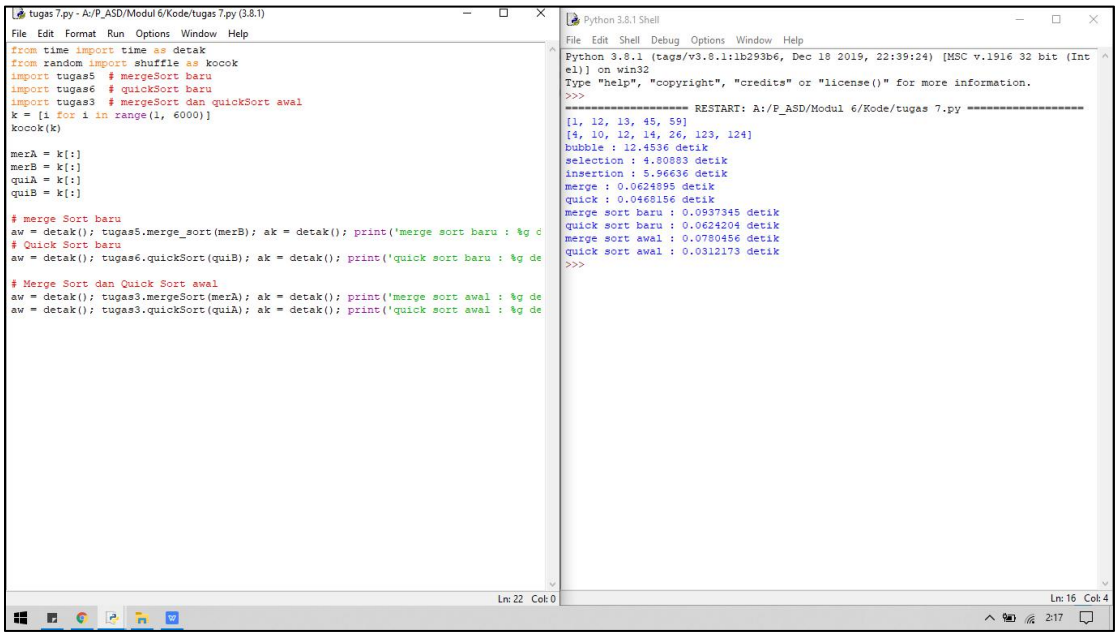
5.



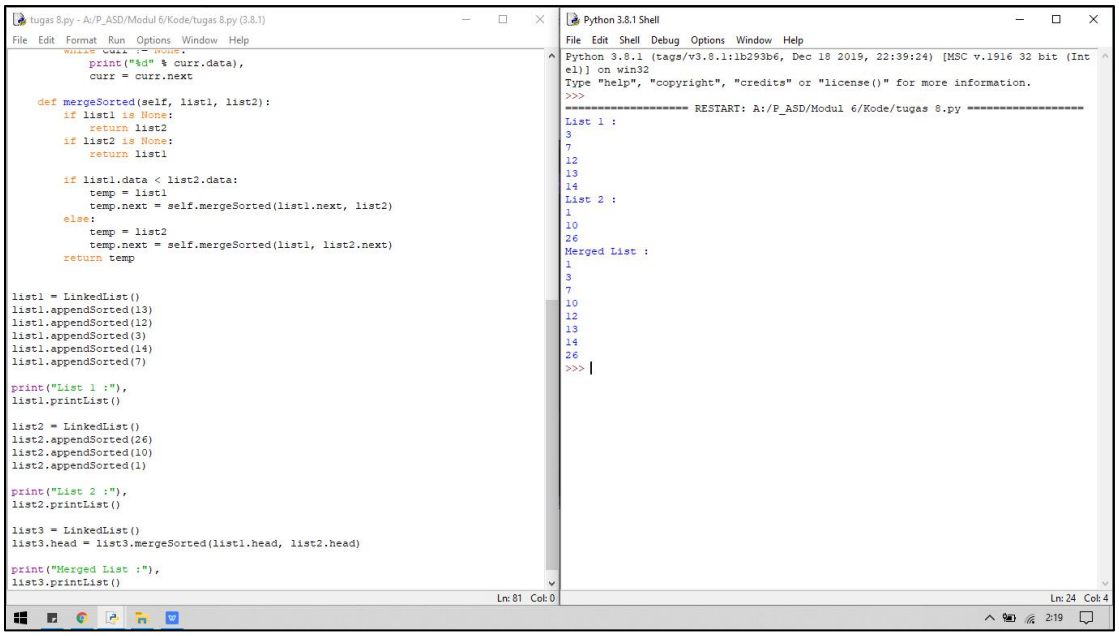
6.


tugas 6.py - A:/P_ASD/Modul 6/Kode/tugas 6.py (3.8.1)
File Edit Format Run Options Window Help
def quicksorthelp(A, low, high):
result = 0
if low < high:
pivot_location, result = Partition(A, low, high)
result += quicksorthelp(A, low, pivot_location)
result += quicksorthelp(A, pivot_location + 1, high)
return result
def Partition(A, low, high):
result = 0
pivot, pidx = median_of_three(A, low, high)
A[low], A[pidx] = A[pidx], A[low]
i = low + 1
for j in range(low + 1, high, 1):
result += 1
if A[j] < pivot:
A[i], A[j] = A[j], A[i]
i += 1
A[low], A[i - 1] = A[i - 1], A[low]
return i - 1, result
def median_of_three(A, low, high):
mid = (low + high - 1) // 2
a = A[low]
b = A[mid]
c = A[high - 1]
if a <= b <= c:
return b, mid
if c <= b <= a:
return b, mid
if a <= c <= b:
return c, high - 1
if b <= c <= a:
return c, high - 1
return a, low
daftar = [12, 4, 10, 124, 14, 123, 26]
quickSort(daftar)
print(daftar)
Ln: 43 Col: 0
Python 3.8.1 Shell
File Edit Shell Debug Options Window Help
Python 3.8.1 (tags/v3.8.1:1b293b6, Dec 18 2019, 22:39:24) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: A:/P_ASD/Modul 6/Kode/tugas 6.py ==========
[4, 10, 12, 14, 26, 123, 124]
>>>
Ln: 6 Col: 4
2:10

7.


tugas 7.py - A:/P_ASD/Modul 6/Kode/tugas 7.py (3.8.1)
File Edit Format Run Options Window Help
from time import time as detak
from random import shuffle as kocok
import tugas5 # mergeSort baru
import tugas6 # quickSort baru
import tugas3 # mergeSort dan quickSort awal
k = [i for i in range(1, 6000)]
kocok(k)
merA = k[:]
merB = k[:]
quiA = k[:]
quiB = k[:]
# merge Sort baru
aw = detak(); tugas5.merge_sort(merB); ak = detak(); print('merge sort baru : %g d
# Quick Sort baru
aw = detak(); tugas6.quickSort(quiB); ak = detak(); print('quick sort baru : %g de
# Merge Sort dan Quick Sort awal
aw = detak(); tugas3.mergeSort(merA); ak = detak(); print('merge sort awal : %g de
aw = detak(); tugas3.quickSort(quiA); ak = detak(); print('quick sort awal : %g de
Ln: 22 Col: 0
Python 3.8.1 Shell
File Edit Shell Debug Options Window Help
Python 3.8.1 (tags/v3.8.1:1b293b6, Dec 18 2019, 22:39:24) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: A:/P_ASD/Modul 6/Kode/tugas 7.py ==========
[1, 12, 13, 45, 59]
[4, 10, 12, 14, 26, 123, 124]
bubble : 12.4536 detik
selection : 4.80883 detik
insertion : 5.96636 detik
merge : 0.0624895 detik
quick : 0.0468156 detik
merge sort baru : 0.0937345 detik
quick sort baru : 0.0624204 detik
merge sort awal : 0.0780456 detik
quick sort awal : 0.0312173 detik
>>>
Ln: 16 Col: 4
2:17

8.


tugas 8.py - A:/P_ASD/Modul 6/Kode/tugas 8.py (3.8.1)
File Edit Format Run Options Window Help
print("%d" % curr.data),
curr = curr.next
def mergeSorted(self, list1, list2):
if list1 is None:
return list2
if list2 is None:
return list1
if list1.data < list2.data:
temp = list1
temp.next = self.mergeSorted(list1.next, list2)
else:
temp = list2
temp.next = self.mergeSorted(list1, list2.next)
return temp
list1 = LinkedList()
list1.appendSorted(13)
list1.appendSorted(12)
list1.appendSorted(3)
list1.appendSorted(14)
list1.appendSorted(7)
print("List 1 :"),
list1.printList()
list2 = LinkedList()
list2.appendSorted(26)
list2.appendSorted(10)
list2.appendSorted(1)
print("List 2 :"),
list2.printList()
list3 = LinkedList()
list3.head = list3.mergeSorted(list1.head, list2.head)
print("Merged List :"),
list3.printList()
Ln: 81 Col: 0
Python 3.8.1 Shell
File Edit Shell Debug Options Window Help
Python 3.8.1 (tags/v3.8.1:1b293b6, Dec 18 2019, 22:39:24) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: A:/P_ASD/Modul 6/Kode/tugas 8.py ==========
List 1 :
3
7
12
13
14
List 2 :
1
10
26
Merged List :
1
3
7
10
12
13
14
26
>>>
Ln: 24 Col: 4
2:19