LAPORAN PRAKTIKUM

Modul 6

Prak Algoritma dan Struktur Data

Semester 4

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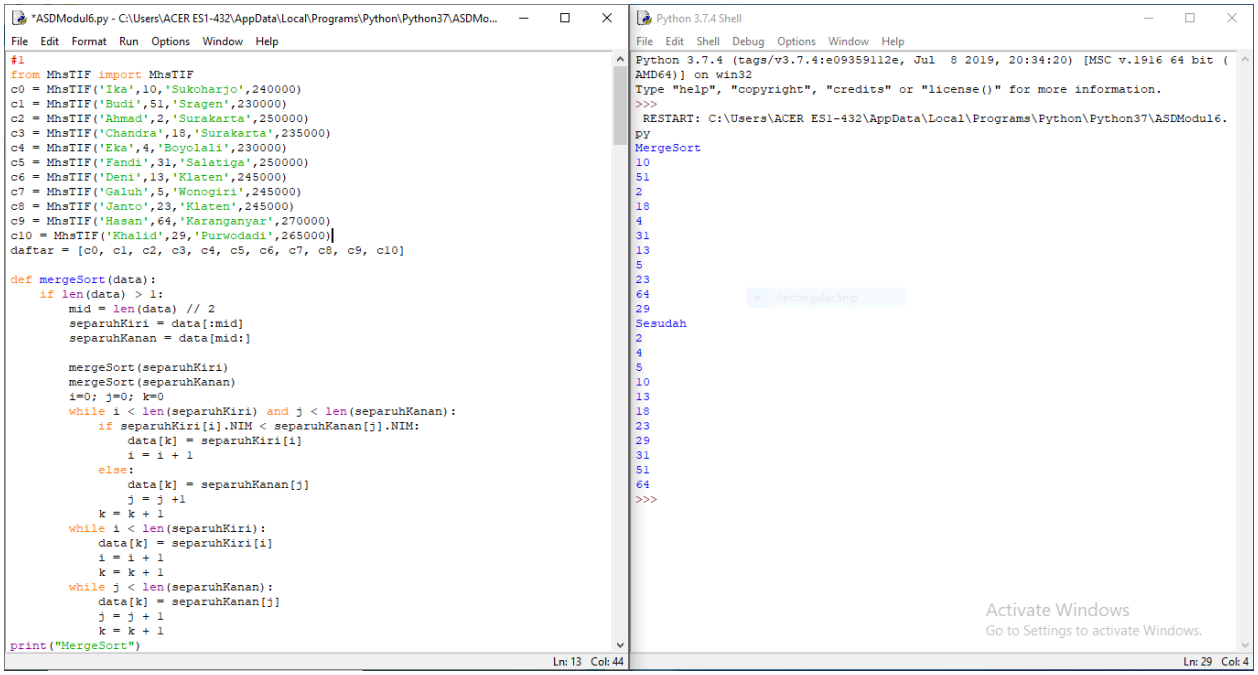
NIM : L200190247

KELAS : G

Tugas

1 MergeSort



*ASDModul6.py - C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDMo...

File Edit Format Run Options Window Help

```
#1
from MhsTIF import MhsTIF
c0 = MhsTIF('Ika',10,'Sukoharjo',240000)
c1 = MhsTIF('Budi',51,'Sragen',230000)
c2 = MhsTIF('Ahmad',2,'Surakarta',250000)
c3 = MhsTIF('Chandra',18,'Surakarta',235000)
c4 = MhsTIF('Eka',4,'Boyolali',230000)
c5 = MhsTIF('Fandi',31,'Salatiga',250000)
c6 = MhsTIF('Deni',13,'Klaten',245000)
c7 = MhsTIF('Galuh',5,'Wonogiri',245000)
c8 = MhsTIF('Janto',23,'Klaten',245000)
c9 = MhsTIF('Hasan',64,'Karanganyar',270000)
c10 = MhsTIF('Khalid',29,'Purwodadi',265000)
daftar = [c0, c1, c2, c3, c4, c5, c6, c7, c8, c9, c10]

def mergeSort(data):
    if len(data) > 1:
        mid = len(data) // 2
        separuhKiri = data[:mid]
        separuhKanan = data[mid:]

        mergeSort(separuhKiri)
        mergeSort(separuhKanan)
        i=0; j=0; k=0
        while i < len(separuhKiri) and j < len(separuhKanan):
            if separuhKiri[i].NIM < separuhKanan[j].NIM:
                data[k] = separuhKiri[i]
                i = i + 1
            else:
                data[k] = separuhKanan[j]
                j = j +1
            k = k + 1
        while i < len(separuhKiri):
            data[k] = separuhKiri[i]
            i = i + 1
            k = k + 1
        while j < len(separuhKanan):
            data[k] = separuhKanan[j]
            j = j + 1
            k = k + 1
print("MergeSort")
```

Ln: 13 Col: 44

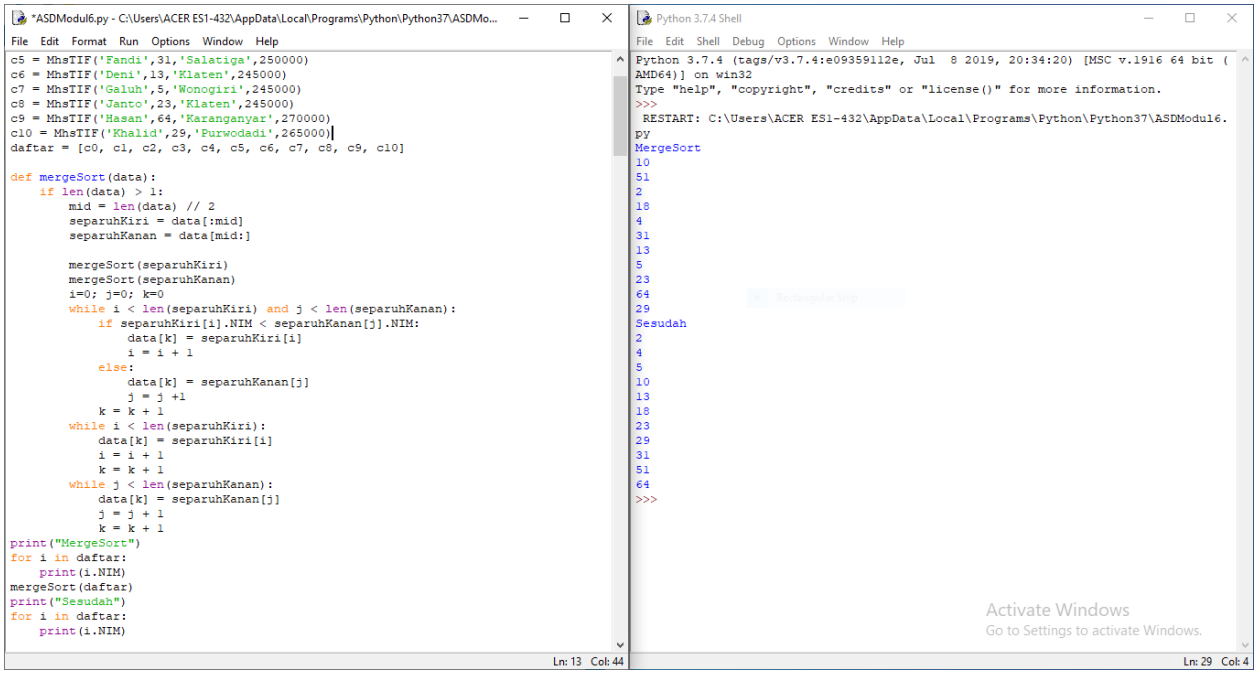
Python 3.7.4 Shell

File Edit Shell Debug Options Window Help

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 20:34:20) [MSC v.1916 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
 RESTART: C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDModul6.
py
MergeSort
10
51
2
18
4
31
13
5
23
64
29
Sesudah
2
4
5
10
13
18
23
29
31
51
64
>>>
```

Activate Windows
Go to Settings to activate Windows.

Ln: 29 Col: 4



*ASDModul6.py - C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDMo...

File Edit Format Run Options Window Help

```
c5 = MhsTIF('Fandi',31,'Salatiga',250000)
c6 = MhsTIF('Deni',13,'Klaten',245000)
c7 = MhsTIF('Galuh',5,'Wonogiri',245000)
c8 = MhsTIF('Janto',23,'Klaten',245000)
c9 = MhsTIF('Hasan',64,'Karanganyar',270000)
c10 = MhsTIF('Khalid',29,'Purwodadi',265000)
daftar = [c0, c1, c2, c3, c4, c5, c6, c7, c8, c9, c10]

def mergeSort(data):
    if len(data) > 1:
        mid = len(data) // 2
        separuhKiri = data[:mid]
        separuhKanan = data[mid:]

        mergeSort(separuhKiri)
        mergeSort(separuhKanan)
        i=0; j=0; k=0
        while i < len(separuhKiri) and j < len(separuhKanan):
            if separuhKiri[i].NIM < separuhKanan[j].NIM:
                data[k] = separuhKiri[i]
                i = i + 1
            else:
                data[k] = separuhKanan[j]
                j = j +1
            k = k + 1
        while i < len(separuhKiri):
            data[k] = separuhKiri[i]
            i = i + 1
            k = k + 1
        while j < len(separuhKanan):
            data[k] = separuhKanan[j]
            j = j + 1
            k = k + 1
print("MergeSort")
for i in daftar:
    print(i.NIM)
mergeSort(daftar)
print("Sesudah")
for i in daftar:
    print(i.NIM)
```

Ln: 13 Col: 44

Python 3.7.4 Shell

File Edit Shell Debug Options Window Help

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 20:34:20) [MSC v.1916 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
 RESTART: C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDModul6.
py
MergeSort
10
51
2
18
4
31
13
5
23
64
29
Sesudah
2
4
5
10
13
18
23
29
31
51
64
>>>
```

Activate Windows
Go to Settings to activate Windows.

Ln: 29 Col: 4

1 QuickSort

ASDModul6.py - C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDMod...

File Edit Format Run Options Window Help

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

def quickSortBantu(data, awal, akhir):
    if awal<akhir:
        titikBelah = partisi(data, awal, akhir)
        quickSortBantu(data, awal, titikBelah-1)
        quickSortBantu(data, titikBelah+1, akhir)

def partisi(data, awal, akhir):
    nilaiPivot = data[awal].NIM
    penandaKiri = awal + 1
    penandaKanan = akhir
    selesai = False

    while not selesai:
        while penandaKiri <= penandaKanan and data[penandaKiri].NIM <= nilaiPivot:
            penandaKiri = penandaKiri + 1
        while penandaKanan >= penandaKiri and data[penandaKanan].NIM >= nilaiPivot
            penandaKanan = penandaKanan - 1
        if penandaKanan < penandaKiri:
            selesai = True
        else:
            temp = data[penandaKiri]
            data[penandaKiri] = data[penandaKanan]
            data[penandaKanan] = temp
    temp = data[awal]
    data[awal] = data[penandaKanan]
    data[penandaKanan] = temp

    return penandaKanan

print("QuickSort")
for i in daftar:
    print(i.NIM)
quickSort(daftar)
print("Sesudah")
for i in daftar:
    print(i.NIM)
```

Ln: 81 Col: 18

Python 3.7.4 Shell

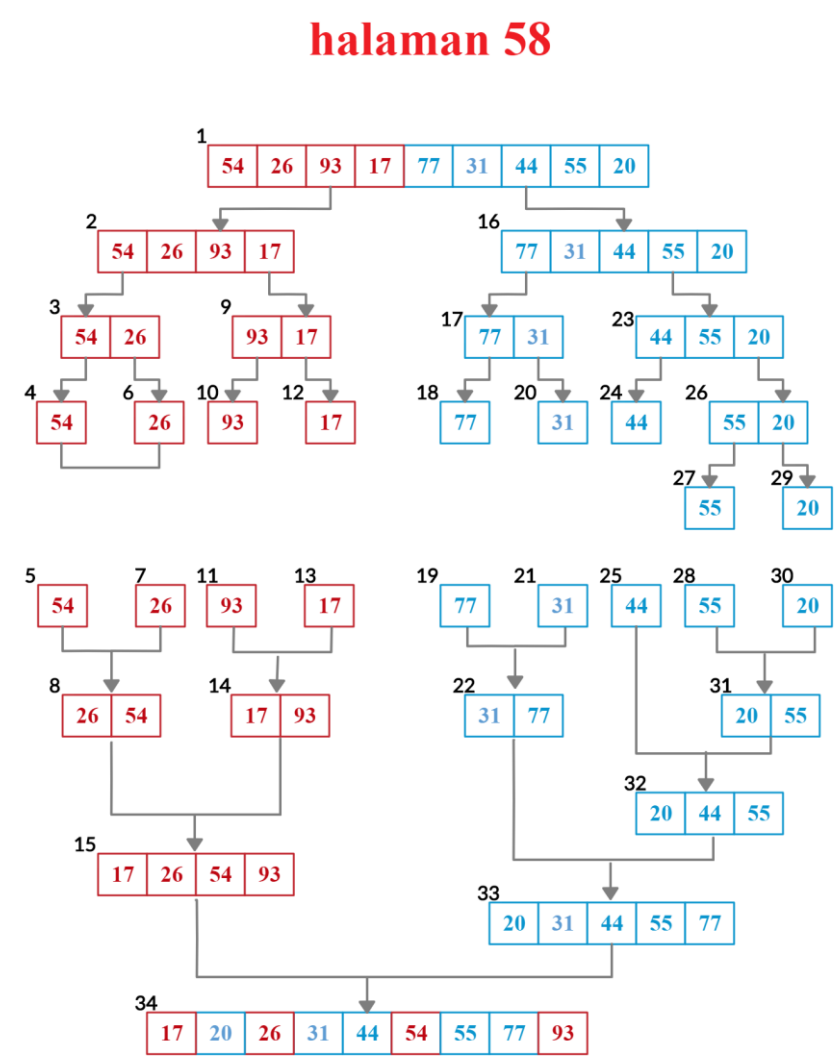
File Edit Shell Debug Options Window Help

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 20:34:20) [MSC v.1916 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
 RESTART: C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDModul6.
py
QuickSort
10
51
2
18
4
31
13
5
23
64
29
Sesudah
2
4
5
10
13
18
23
29
31
51
64
>>>
```

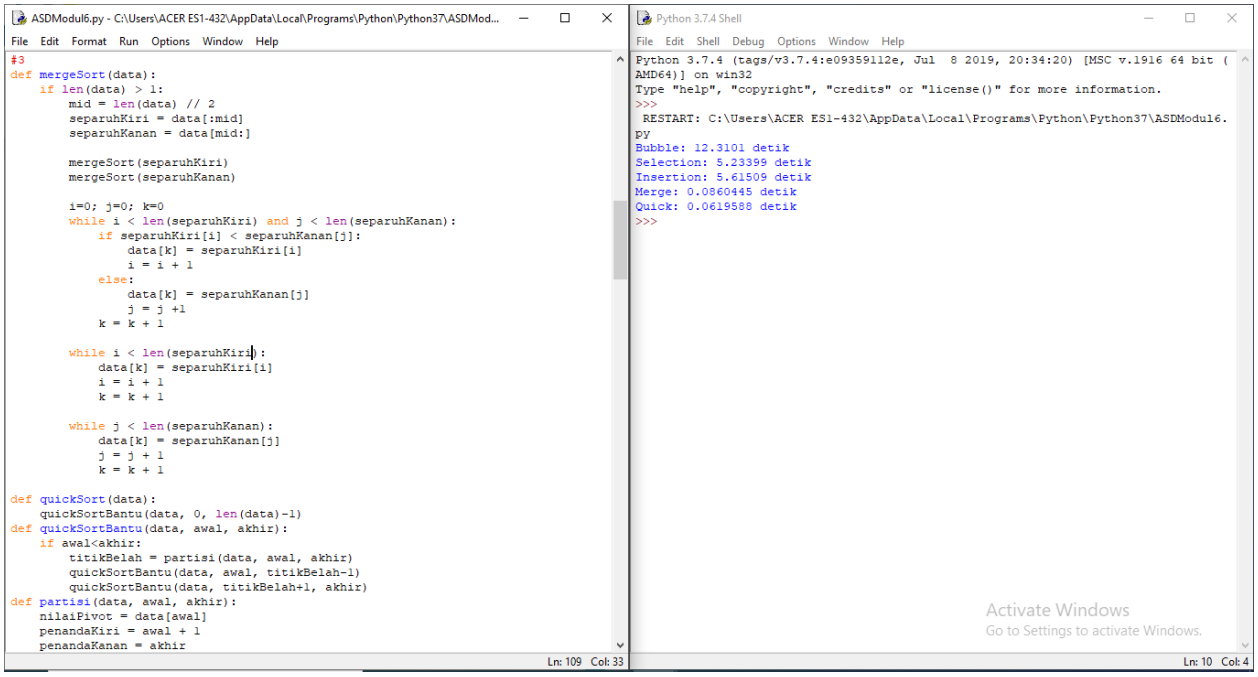
Activate Windows
Go to Settings to activate Windows.

Ln: 29 Col: 4

2



3



ASDModul6.py - C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDMod...

File Edit Format Run Options Window Help

```
#3
def mergeSort(data):
    if len(data) > 1:
        mid = len(data) // 2
        separuhKiri = data[:mid]
        separuhKanan = data[mid:]

        mergeSort(separuhKiri)
        mergeSort(separuhKanan)

        i=0; j=0; k=0
        while i < len(separuhKiri) and j < len(separuhKanan):
            if separuhKiri[i] < separuhKanan[j]:
                data[k] = separuhKiri[i]
                i = i + 1
            else:
                data[k] = separuhKanan[j]
                j = j +1
            k = k + 1

        while i < len(separuhKiri):
            data[k] = separuhKiri[i]
            i = i + 1
            k = k + 1

        while j < len(separuhKanan):
            data[k] = separuhKanan[j]
            j = j + 1
            k = k + 1

def quickSort(data):
    quickSortBantu(data, 0, len(data)-1)
def quickSortBantu(data, awal, akhir):
    if awal<akhir:
        titikBelah = partisi(data, awal, akhir)
        quickSortBantu(data, awal, titikBelah-1)
        quickSortBantu(data, titikBelah+1, akhir)
def partisi(data, awal, akhir):
    nilaiPivot = data[awal]
    penandaKiri = awal + 1
    penandaKanan = akhir
```

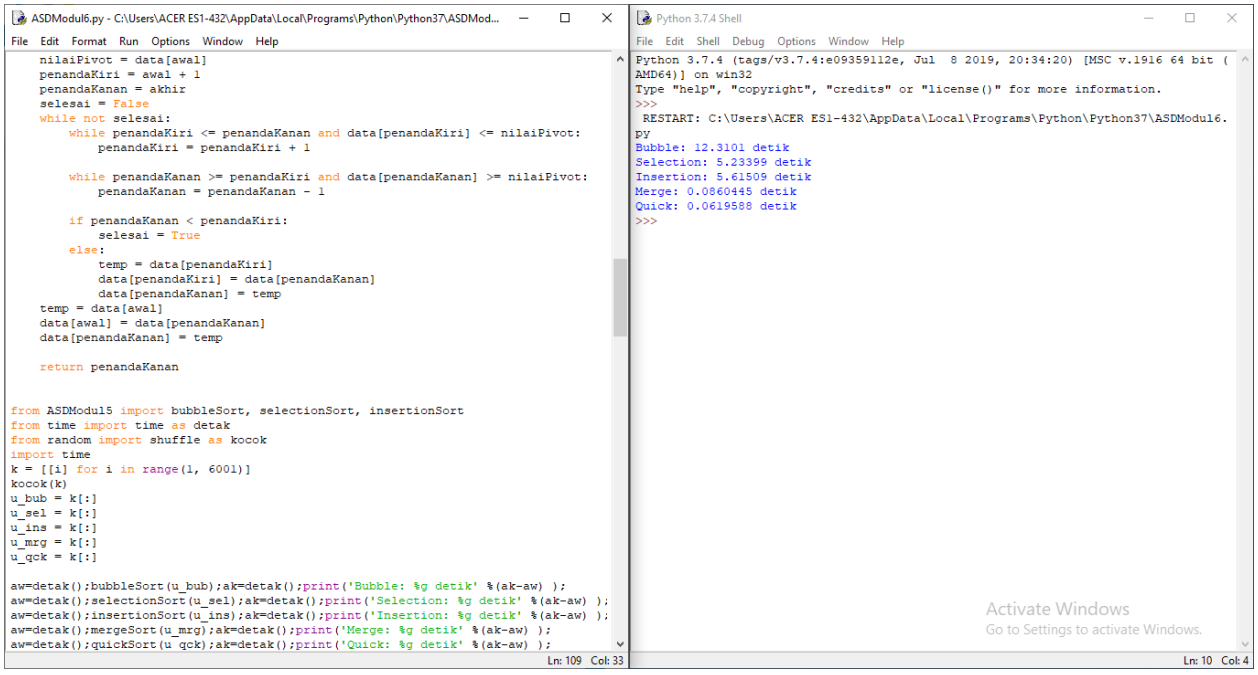
Ln: 109 Col: 33

Python 3.7.4 Shell

File Edit Shell Debug Options Window Help

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 20:34:20) [MSC v.1916 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
 RESTART: C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDModul6.
py
Bubble: 12.3101 detik
Selection: 5.23399 detik
Insertion: 5.61509 detik
Merge: 0.0860445 detik
Quick: 0.0619588 detik
>>>
```


Ln: 10 Col: 4



ASDModul6.py - C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDMod...

File Edit Format Run Options Window Help

```
    nilaiPivot = data[awal]
    penandaKiri = awal + 1
    penandaKanan = akhir
    selesai = False
    while not selesai:
        while penandaKiri <= penandaKanan and data[penandaKiri] <= nilaiPivot:
            penandaKiri = penandaKiri + 1

        while penandaKanan >= penandaKiri and data[penandaKanan] >= nilaiPivot:
            penandaKanan = penandaKanan - 1

        if penandaKanan < penandaKiri:
            selesai = True
        else:
            temp = data[penandaKiri]
            data[penandaKiri] = data[penandaKanan]
            data[penandaKanan] = temp
    temp = data[awal]
    data[awal] = data[penandaKanan]
    data[penandaKanan] = temp

    return penandaKanan


from ASDModul5 import bubbleSort, selectionSort, insertionSort
from time import time as detak
from random import shuffle as kocok
import time
k = [[i] for i in range(1, 6001)]
kocok(k)
u_bub = k[:]
u_sel = k[:]
u_ins = k[:]
u_mrg = k[:]
u_qck = k[:]

aw=detak();bubbleSort(u_bub);ak=detak();print('Bubble: %g detik' %(ak-aw) );
aw=detak();selectionSort(u_sel);ak=detak();print('Selection: %g detik' %(ak-aw) );
aw=detak();insertionSort(u_ins);ak=detak();print('Insertion: %g detik' %(ak-aw) );
aw=detak();mergeSort(u_mrg);ak=detak();print('Merge: %g detik' %(ak-aw) );
aw=detak();quickSort(u_qck);ak=detak();print('Quick: %g detik' %(ak-aw) );
```

Ln: 109 Col: 33

Python 3.7.4 Shell

File Edit Shell Debug Options Window Help

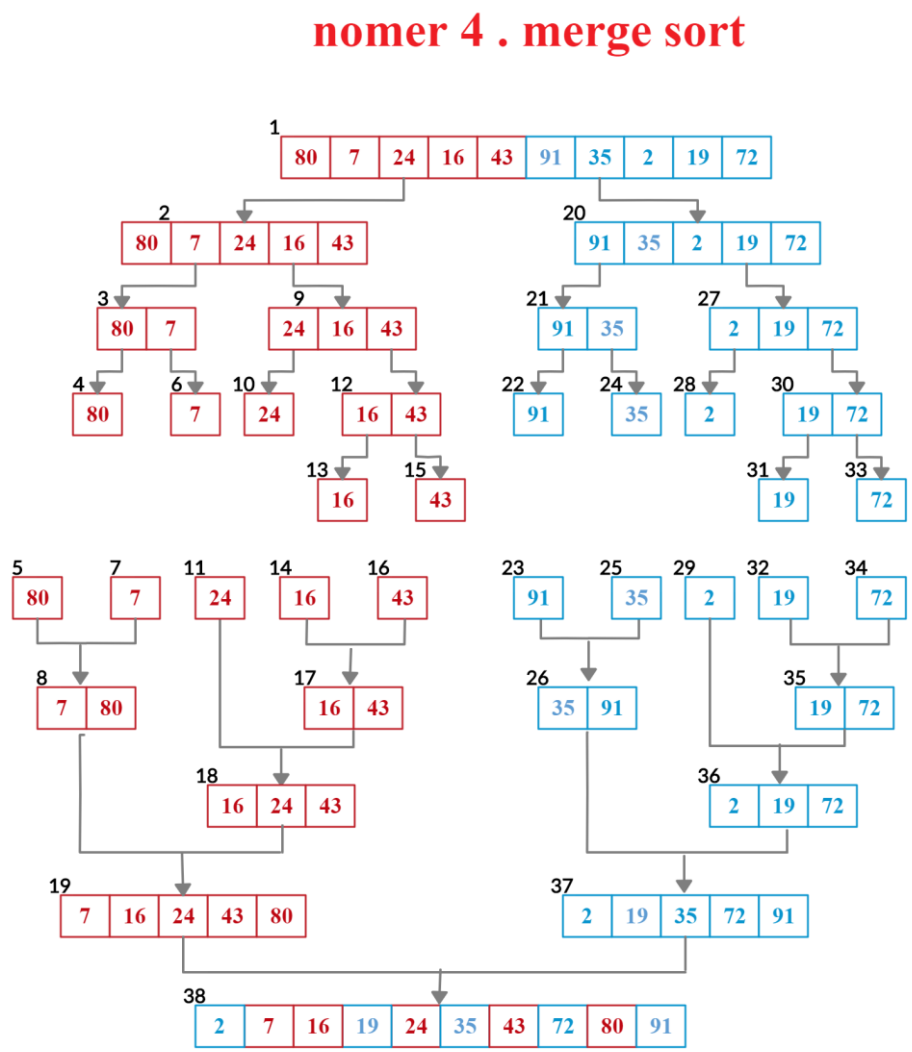
```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 20:34:20) [MSC v.1916 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
 RESTART: C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDModul6.
py
Bubble: 12.3101 detik
Selection: 5.23399 detik
Insertion: 5.61509 detik
Merge: 0.0860445 detik
Quick: 0.0619588 detik
>>>
```


Ln: 10 Col: 4

Isi ASDModul5

```
def swap(a,b,c):
    temp = a[b]
    a[b] = a[c]
    a[c] = temp

def cariPosisiYangTerkecil(A, dariSini, sampaiSini):
    posisiTerkecil = dariSini
    for i in range(dariSini+1, sampaiSini):
        if A[1] < A[posisiTerkecil]:
            posisiTerkecil = 1
    return posisiTerkecil
def bubbleSort(A):
    n = len(A)
    for i in range(n-1):
        for j in range(n-i-1):
            if A[j] > A[j+1]:
                swap(A,j,j+1)
def selectionSort(A):
    n = len(A)
    for i in range(n-1):
        indexKecil = cariPosisiYangTerkecil(A, i, n)
        if indexKecil != i:
            swap(A, i, indexKecil)
def insertionSort(A):
    n = len(A)
    for i in range(1,n):
        nilai = A[i]
        pos = i
        while pos > 0 and nilai < A[pos-1]:
            A[pos] = A[pos-1]
            pos = pos-1
        A[pos] = nilai
```

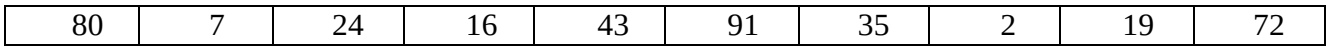
4a



4b

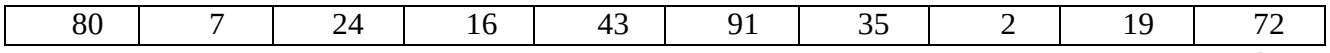
QuickSort

List = [80,7,24,16,43,91,35,2,19,72]



80	7	24	16	43	91	35	2	19	72

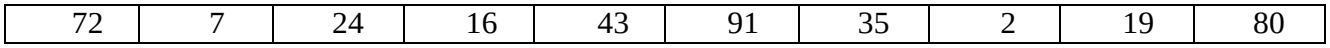
pivot



80	7	24	16	43	91	35	2	19	72

Low High

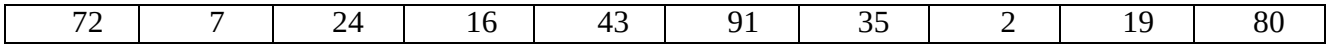
pivot



72	7	24	16	43	91	35	2	19	80

Low High

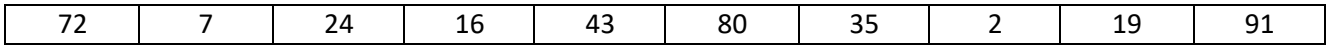
pivot



72	7	24	16	43	91	35	2	19	80

Low High

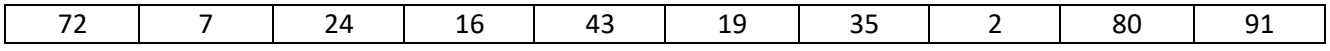
pivot



72	7	24	16	43	80	35	2	19	91

Low High

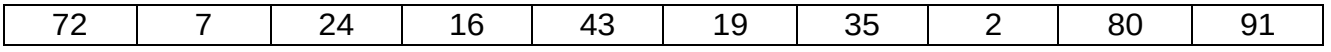
pivot



72	7	24	16	43	19	35	2	80	91

Low High

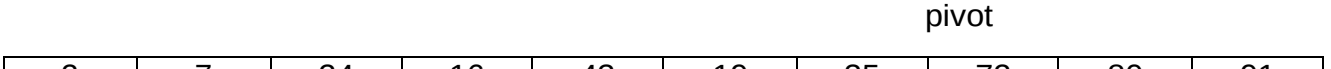
pivot



72	7	24	16	43	19	35	2	80	91

Low High

pivot



2	7	24	16	43	19	35	72	80	91

Low High

pivot

2	7	24	16	43	19	35	72	80	91

Low High

pivot

2	7	24	16	43	19	35	72	80	91

Low High

pivot

2	7	24	16	43	19	35	72	80	91

Low High

pivot

2	7	24	16	43	19	35	72	80	91

Low High

pivot

2	7	19	16	43	24	35	72	80	91

Low High

pivot

2	7	19	16	43	24	35	72	80	91

Low High

pivot

2	7	19	16	24	43	35	72	80	91

Low High

pivot

2	7	19	16	24	43	35	72	80	91

Low High

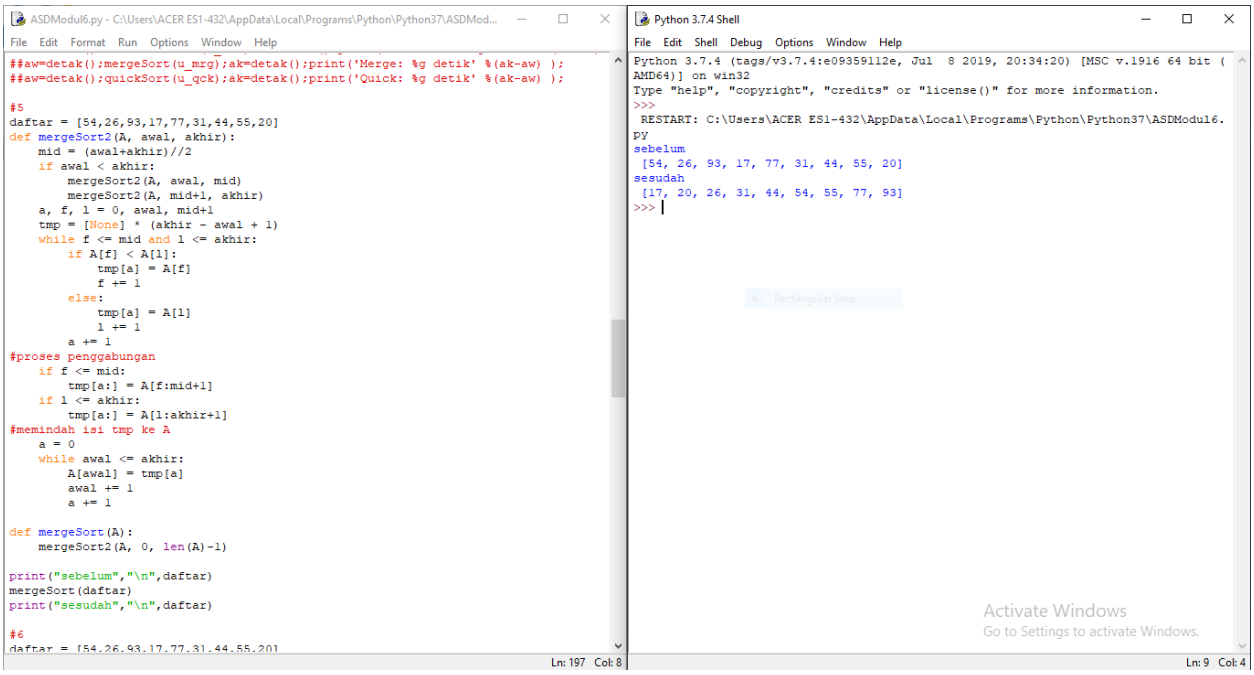
pivot

2	7	16	19	24	35	43	72	80	91

Low High

2	7	16	19	24	35	43	72	80	91

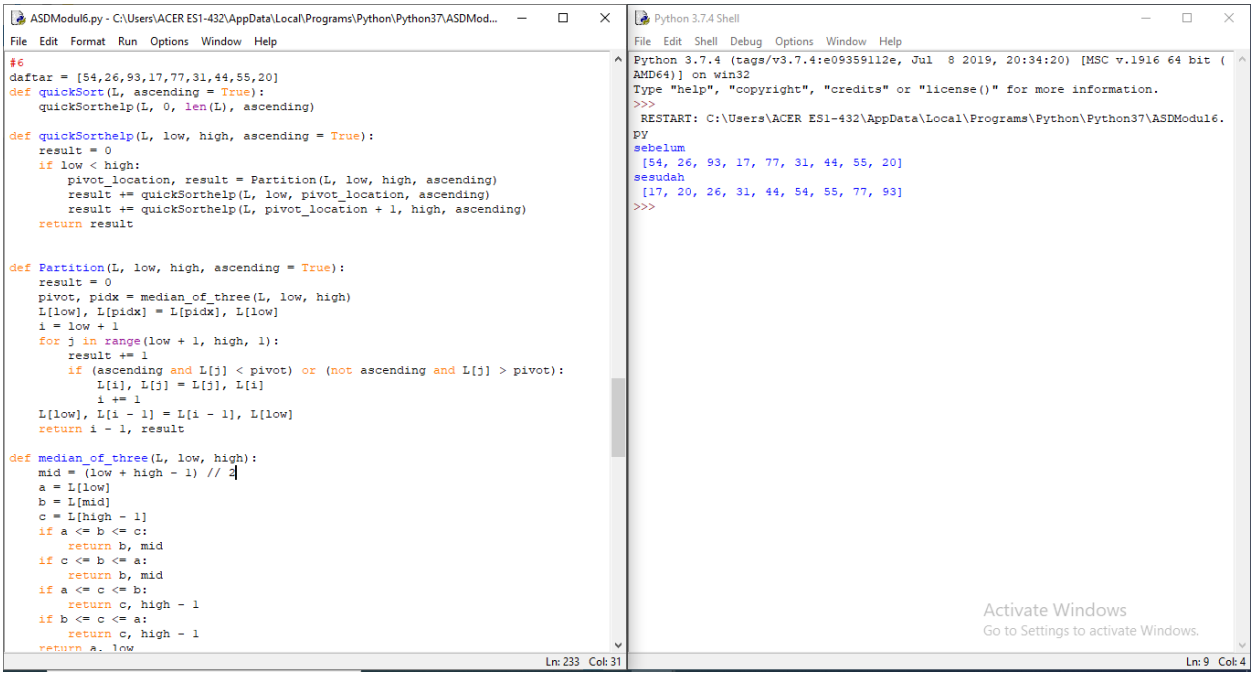
5



```
##aw=detak();mergeSort(u_mrg);ak=detak();print('Merge: %g detik' %(ak-aw) );
##aw=detak();quickSort(u_qck);ak=detak();print('Quick: %g detik' %(ak-aw) );

#5
daftar = [54,26,93,17,77,31,44,55,20]
def mergeSort2(A, awal, akhir):
    mid = (awal+akhir)//2
    if awal < akhir:
        mergeSort2(A, awal, mid)
        mergeSort2(A, mid+1, akhir)
    a, f, l = 0, awal, mid+1
    tmp = [None] * (akhir - awal + 1)
    while f <= mid and l <= akhir:
        if A[f] < A[l]:
            tmp[a] = A[f]
            f += 1
        else:
            tmp[a] = A[l]
            l += 1
        a += 1
#proses penggabungan
    if f <= mid:
        tmp[a:] = A[f:mid+1]
    if l <= akhir:
        tmp[a:] = A[l:akhir+1]
#memindah isi tmp ke A
    a = 0
    while awal <= akhir:
        A[awal] = tmp[a]
        awal += 1
        a += 1

def mergeSort(A):
    mergeSort2(A, 0, len(A)-1)

print("sebelum","\n",daftar)
mergeSort(daftar)
print("sesudah","\n",daftar)

#6
daftar = [54,26,93,17,77,31,44,55,20]
```

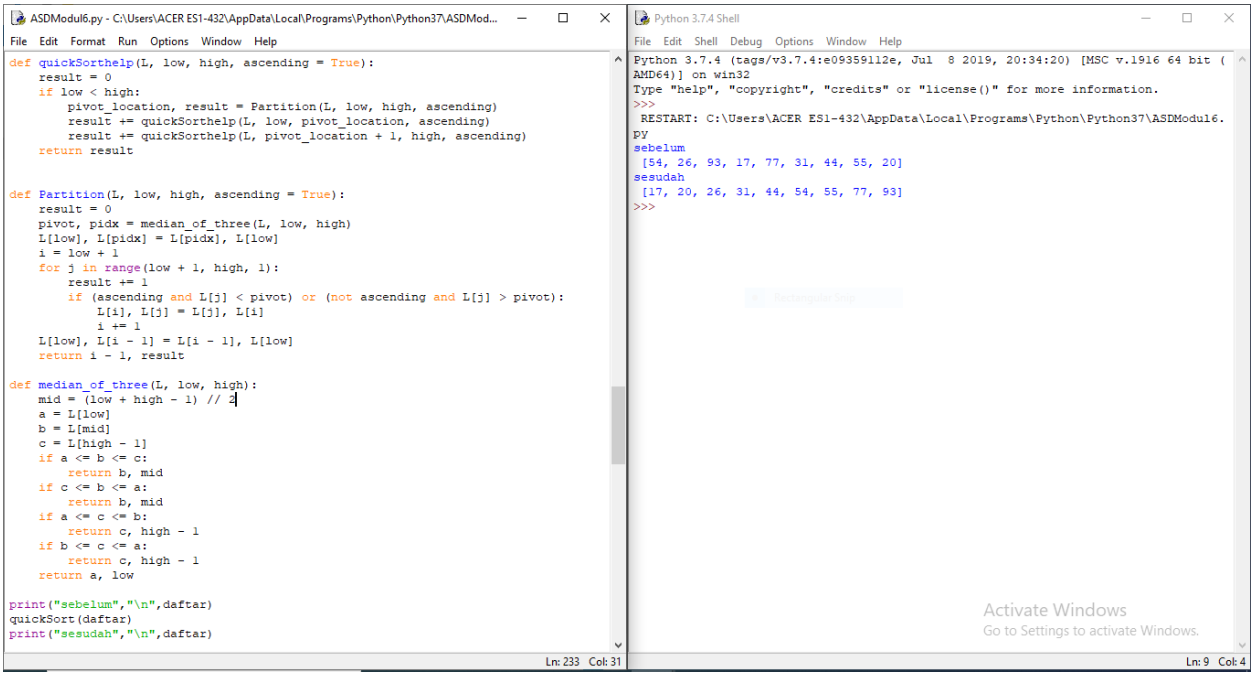
```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 20:34:20) [MSC v.1916 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
 RESTART: C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDModul6.
py
sebelum
 [54, 26, 93, 17, 77, 31, 44, 55, 20]
sesudah
 [17, 20, 26, 31, 44, 54, 55, 77, 93]
>>>
```

6



```
#6
daftar = [54,26,93,17,77,31,44,55,20]
def quickSort(L, ascending = True):
    quickSorthelp(L, 0, len(L), ascending)

def quickSorthelp(L, low, high, ascending = True):
    result = 0
    if low < high:
        pivot_location, result = Partition(L, low, high, ascending)
        result += quickSorthelp(L, low, pivot_location, ascending)
        result += quickSorthelp(L, pivot_location + 1, high, ascending)
    return result


def Partition(L, low, high, ascending = True):
    result = 0
    pivot, pidx = median_of_three(L, low, high)
    L[low], L[pidx] = L[pidx], L[low]
    i = low + 1
    for j in range(low + 1, high, 1):
        result += 1
        if (ascending and L[j] < pivot) or (not ascending and L[j] > pivot):
            L[i], L[j] = L[j], L[i]
            i += 1
    L[low], L[i - 1] = L[i - 1], L[low]
    return i - 1, result

def median_of_three(L, low, high):
    mid = (low + high - 1) // 2
    a = L[low]
    b = L[mid]
    c = L[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
```

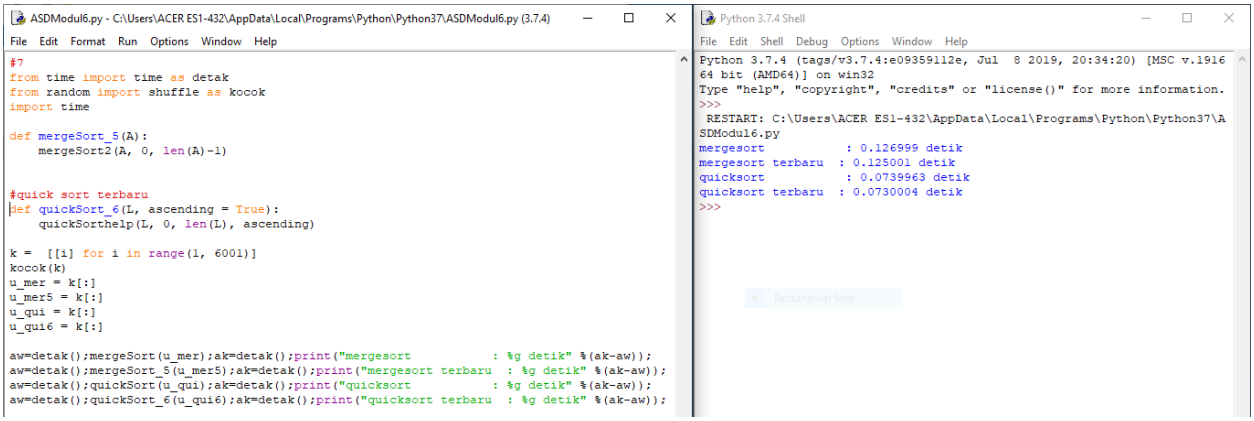
```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 20:34:20) [MSC v.1916 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
 RESTART: C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDModul6.
py
sebelum
 [54, 26, 93, 17, 77, 31, 44, 55, 20]
sesudah
 [17, 20, 26, 31, 44, 54, 55, 77, 93]
>>>
```



```
def quickSorthelp(L, low, high, ascending = True):
    result = 0
    if low < high:
        pivot_location, result = Partition(L, low, high, ascending)
        result += quickSorthelp(L, low, pivot_location, ascending)
        result += quickSorthelp(L, pivot_location + 1, high, ascending)
    return result


def Partition(L, low, high, ascending = True):
    result = 0
    pivot, pidx = median_of_three(L, low, high)
    L[low], L[pidx] = L[pidx], L[low]
    i = low + 1
    for j in range(low + 1, high, 1):
        result += 1
        if (ascending and L[j] < pivot) or (not ascending and L[j] > pivot):
            L[i], L[j] = L[j], L[i]
            i += 1
    L[low], L[i - 1] = L[i - 1], L[low]
    return i - 1, result

def median_of_three(L, low, high):
    mid = (low + high - 1) // 2
    a = L[low]
    b = L[mid]
    c = L[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

print("sebelum","\n",daftar)
quickSort(daftar)
print("sesudah","\n",daftar)
```

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 20:34:20) [MSC v.1916 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
 RESTART: C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDModul6.
py
sebelum
 [54, 26, 93, 17, 77, 31, 44, 55, 20]
sesudah
 [17, 20, 26, 31, 44, 54, 55, 77, 93]
>>>
```

7



ASDModul6.py - C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDModul6.py (3.7.4)

File Edit Format Run Options Window Help

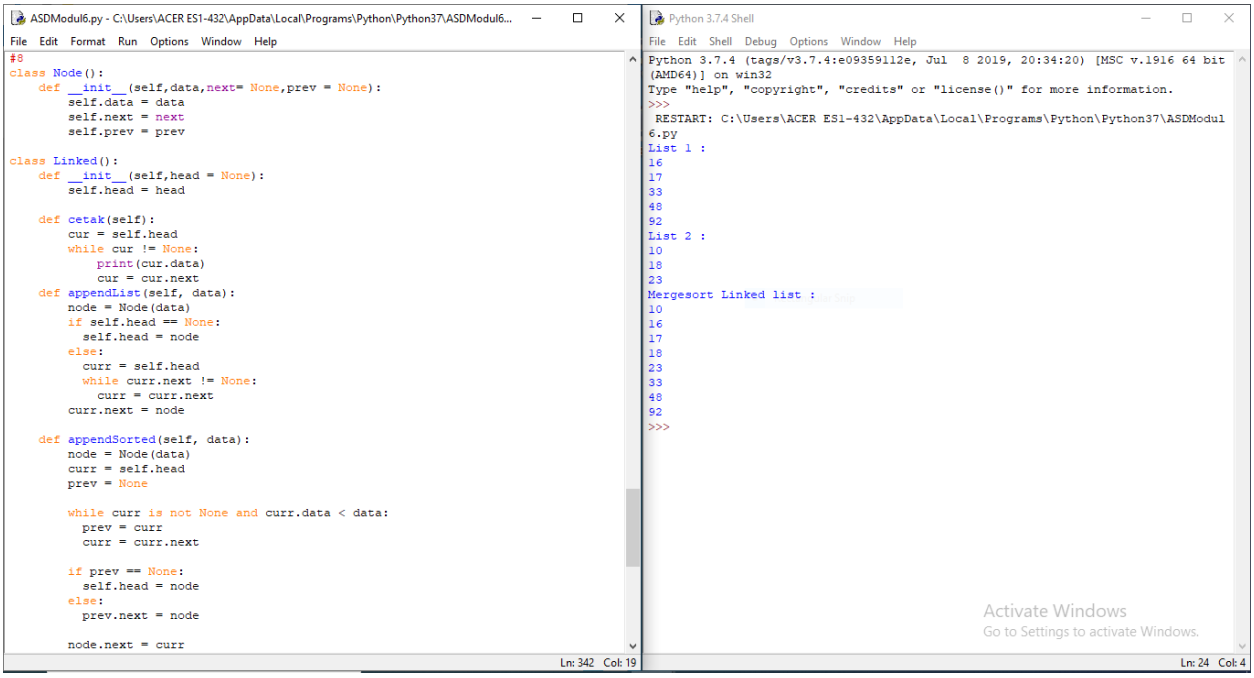
```
#7
from time import time as detak
from random import shuffle as kocok
import time

def mergeSort_5(A):
    mergeSort2(A, 0, len(A)-1)


#quick sort terbaru
def quickSort_6(L, ascending = True):
    quickSorthelp(L, 0, len(L), ascending)

k =  [[i] for i in range(1, 6001)]
kocok(k)
u_mer = k[:]
u_mer5 = k[:]
u_qui = k[:]
u_qui6 = k[:]

aw=detak();mergeSort(u_mer);ak=detak();print("mergesort           : %g detik" %(ak-aw));
aw=detak();mergeSort_5(u_mer5);ak=detak();print("mergesort terbaru  : %g detik" %(ak-aw));
aw=detak();quickSort(u_qui);ak=detak();print("quicksort           : %g detik" %(ak-aw));
aw=detak();quickSort_6(u_qui6);ak=detak();print("quicksort terbaru  : %g detik" %(ak-aw));
```

Python 3.7.4 Shell

File Edit Shell Debug Options Window Help

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 20:34:20) [MSC v.1916
64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
 RESTART: C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\A
SDModul6.py
mergesort           : 0.126999 detik
mergesort terbaru  : 0.125001 detik
quicksort           : 0.0739963 detik
quicksort terbaru  : 0.0730004 detik
>>>
```

8



ASDModul6.py - C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDModul6...

File Edit Format Run Options Window Help

```
#8
class Node():
    def __init__(self,data,next= None,prev = None):
        self.data = data
        self.next = next
        self.prev = prev

class Linked():
    def __init__(self,head = None):
        self.head = head

    def cetak(self):
        cur = self.head
        while cur != None:
            print(cur.data)
            cur = cur.next
    def appendList(self, data):
        node = Node(data)
        if self.head == None:
          self.head = node
        else:
          curr = self.head
          while curr.next != None:
            curr = curr.next
        curr.next = node

    def appendSorted(self, data):
        node = Node(data)
        curr = self.head
        prev = None

        while curr is not None and curr.data < data:
          prev = curr
          curr = curr.next

        if prev == None:
          self.head = node
        else:
          prev.next = node

        node.next = curr
```

Ln: 342 Col: 19

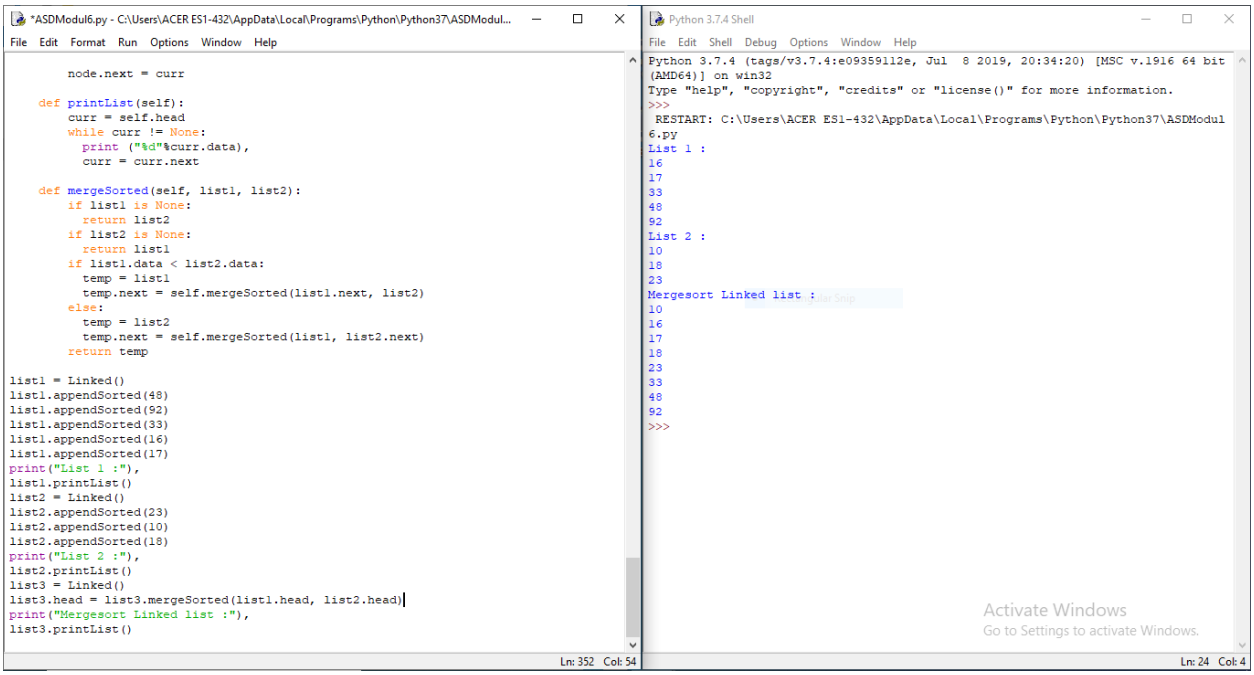
Python 3.7.4 Shell

File Edit Shell Debug Options Window Help

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 20:34:20) [MSC v.1916 64 bit
(AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
 RESTART: C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDModul
6.py
List 1 :
16
17
33
48
92
List 2 :
10
18
23
Mergesort Linked list :
10
16
17
18
23
33
48
92
>>>
```

Activate Windows
Go to Settings to activate Windows.

Ln: 24 Col: 4


*ASDModul6.py - C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDModul...
File Edit Format Run Options Window Help
node.next = curr
def printList(self):
curr = self.head
while curr != None:
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 = Linked()
list1.appendSorted(48)
list1.appendSorted(92)
list1.appendSorted(33)
list1.appendSorted(16)
list1.appendSorted(17)
print("List 1 :"),
list1.printList()
list2 = Linked()
list2.appendSorted(23)
list2.appendSorted(10)
list2.appendSorted(18)
print("List 2 :"),
list2.printList()
list3 = Linked()
list3.head = list3.mergeSorted(list1.head, list2.head)
print("Mergesort Linked list :"),
list3.printList()
Ln: 352 Col: 54
Python 3.7.4 Shell
File Edit Shell Debug Options Window Help
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul 8 2019, 20:34:20) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
RESTART: C:\Users\ACER ES1-432\AppData\Local\Programs\Python\Python37\ASDModul6.py
List 1 :
16
17
33
48
92
List 2 :
10
18
23
Mergesort Linked list :
10
16
17
18
23
33
48
92
>>>
Activate Windows
Go to Settings to activate Windows.
Ln: 24 Col: 4