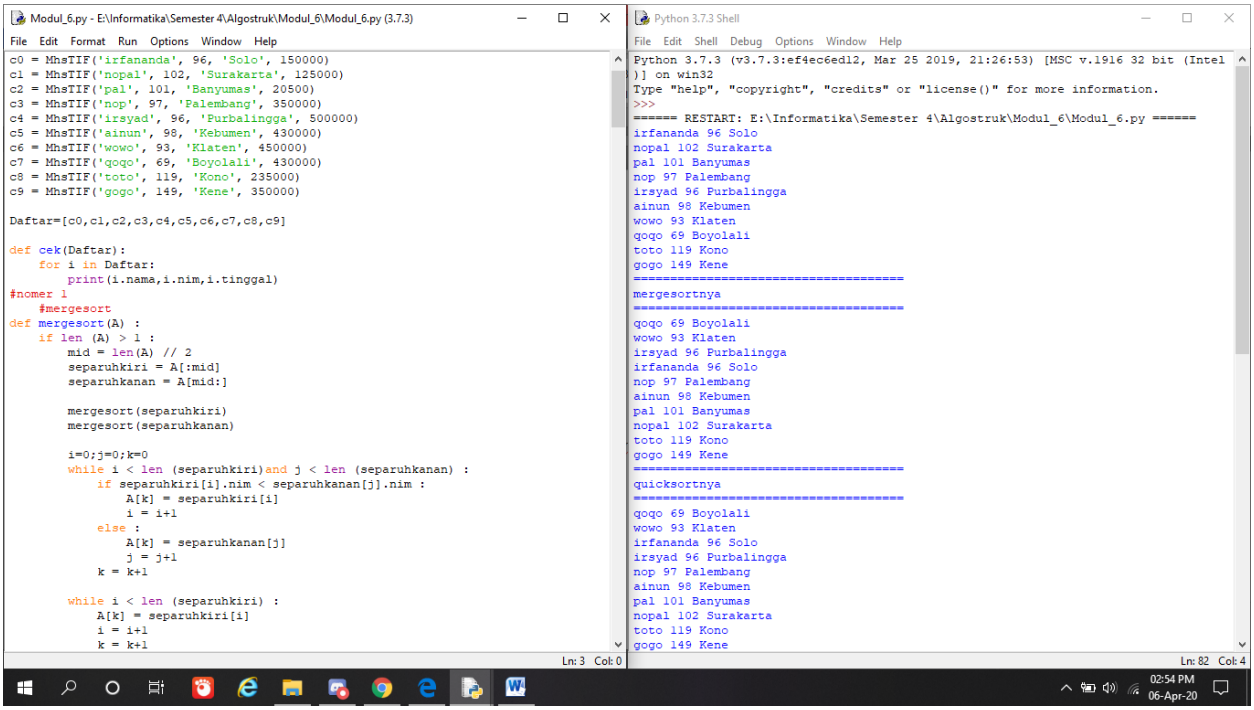
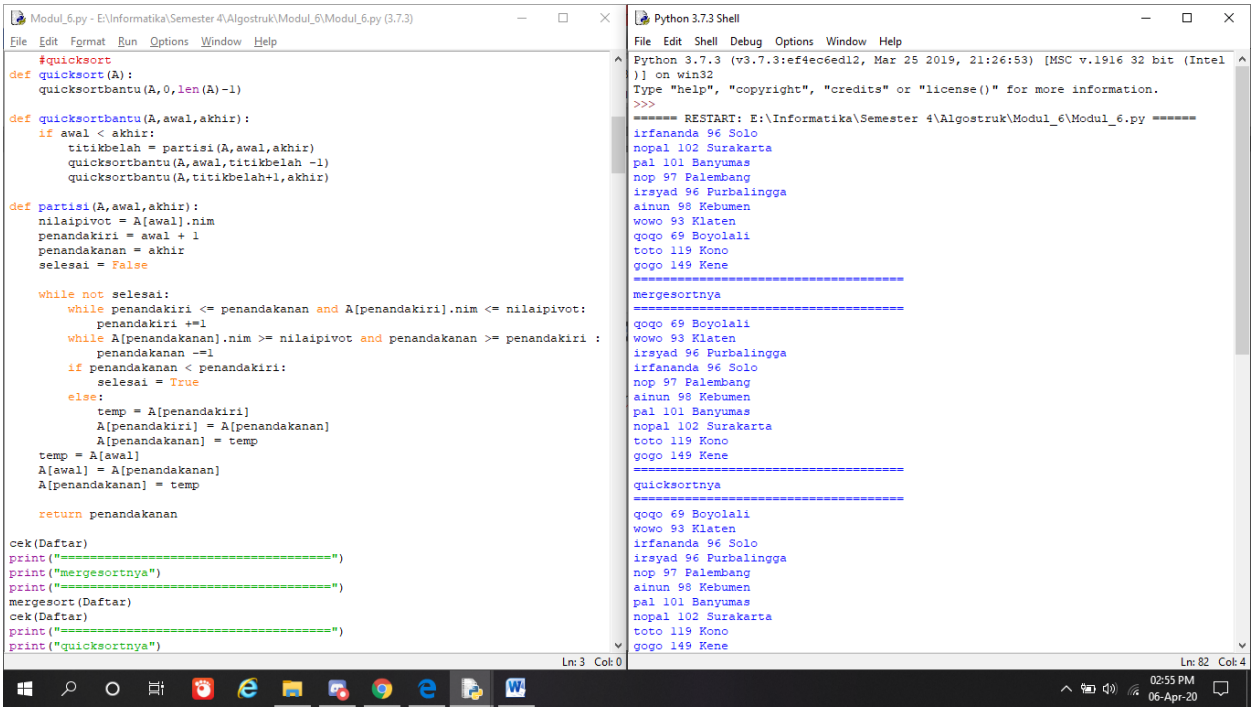
Nama : Irfananda Irsyad A
NIM : L200180096
Kelas : D

Praktikum ALGOSTRUK Modul 6

1. A.



B.

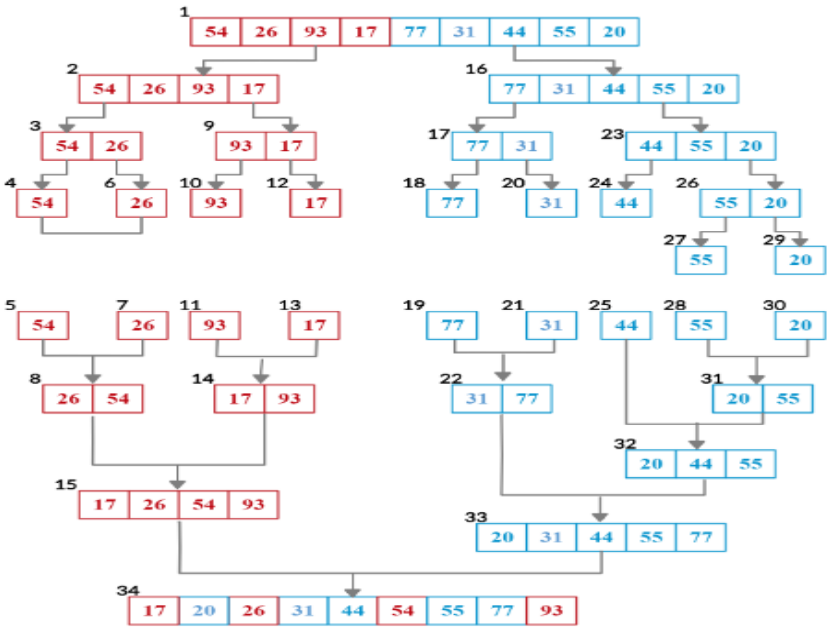


```
Modul_6.py - E:\Informatika\Semester 4\Algostruk\Modul_6\Modul_6.py (3.7.3)
File  Edit  Format  Run  Options  Window  Help
    #quicksort
def quicksort(A):
    quicksortbantu(A,0,len(A)-1)

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].nim
    penandakiri = awal + 1
    penandakanan = akhir
    selesai = False

    while not selesai:
        while penandakiri <= penandakanan and A[penandakiri].nim <= nilaipivot:
            penandakiri +=1
        while A[penandakanan].nim >= 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[penandakanan]
    A[penandakanan] = temp

    return penandakanan

cek(Daftar)
print("======================================")
print("mergesortnya")
print("======================================")
mergesort(Daftar)
cek(Daftar)
print("======================================")
print("quicksortnya")
Ln: 3  Col: 0
```

```
Python 3.7.3 Shell
File  Edit  Shell  Debug  Options  Window  Help
Python 3.7.3 (v3.7.3:ef4ec6ed12, Mar 25 2019, 21:26:53) [MSC v.1916 32 bit (Intel
)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
====== RESTART: E:\Informatika\Semester 4\Algostruk\Modul_6\Modul_6.py ======
irfananda 96 Solo
nopal 102 Surakarta
pal 101 Banyumas
nop 97 Palembang
irsyad 96 Purbalingga
ainun 98 Kebumen
wowo 93 Klaten
qoqo 69 Boyolali
toto 119 Kono
gogo 149 Kene
======================================
mergesortnya
======================================
qoqo 69 Boyolali
wowo 93 Klaten
irsyad 96 Purbalingga
irfananda 96 Solo
nop 97 Palembang
ainun 98 Kebumen
pal 101 Banyumas
nopal 102 Surakarta
toto 119 Kono
gogo 149 Kene
======================================
quicksortnya
======================================
qoqo 69 Boyolali
wowo 93 Klaten
irfananda 96 Solo
irsyad 96 Purbalingga
nop 97 Palembang
ainun 98 Kebumen
pal 101 Banyumas
nopal 102 Surakarta
toto 119 Kono
gogo 149 Kene
Ln: 82  Col: 4
```


2. Berikan nomor urut eksekusi proses gambar 6.1 dan 6.2 mengacu pada output di halaman 59

halaman 58



3.

Modul_6.py - E:\Informatika\Semester 4\Algostruk\Modul_6\Modul_6.py (3.7.3)

File Edit Format Run Options Window Help

```
##nomor 3
from time import time as detak
from random import shuffle as kocok
import time

def swap(A, p, q):
    tmp = A[p]
    A[p] = A[q]
    A[q] = tmp

def cariPosisiYangTerkecil(A, dariSini, sampaiSini):
    posisiYangTerkecil = dariSini
    for i in range(dariSini+1, sampaiSini):
        if A[i] < A[posisiYangTerkecil]:
            posisiYangTerkecil = i
    return posisiYangTerkecil

def bubbleSort(S):
    n = len(S)
    for i in range (n-1):
        for j in range (n-i-1):
            if S[j] > S[j+1]:
                swap(S,j,j+1)
    return S

def selectionSort(S):
    n = len(S)
    for i in range(n-1):
        indexKecil = cariPosisiYangTerkecil(S, i, n)
        if indexKecil != i:
            swap(S, i, indexKecil)
    return S

def insertionSort(S):
    n = len(S)
    for i in range(1, n):
        nilai = S[i]
        pos = i
        while pos > 0 and nilai < S[pos -1]:
            S[pos] = S[pos-1]
            pos = pos - 1
```

Ln: 3 Col: 0

Python 3.7.3 Shell

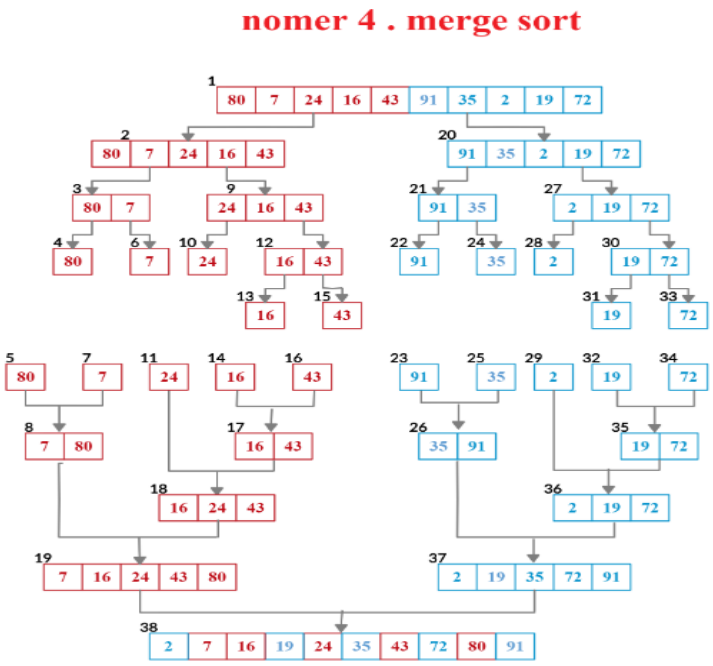
File Edit Shell Debug Options Window Help

```
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
bubble: 13.8486 detik
selection: 6.09439 detik
insertion: 5.849 detik
merge: 0.103201 detik
quick: 0.0643694 detik
sebelum
 [54, 26, 93, 17, 77, 31, 44, 55, 20]
sesudah
 [17, 20, 26, 31, 44, 54, 55, 77, 93]
sebelum
 [54, 26, 93, 17, 77, 31, 44, 55, 20]
sesudah
 [17, 20, 26, 31, 44, 54, 55, 77, 93]
mergesort          : 0.143615 detik
mergesort terbaru  : 0.161566 detik
quicksort          : 0.0578394 detik
quicksort terbaru  : 0.0698128 detik
List 1 :
16
17
33
48
92
List 2 :
10
18
23
Mergesort Linked list :
10
16
17
18
23
33
48
92
```

Ln: 82 Col: 4

02:58 PM
06-Apr-20

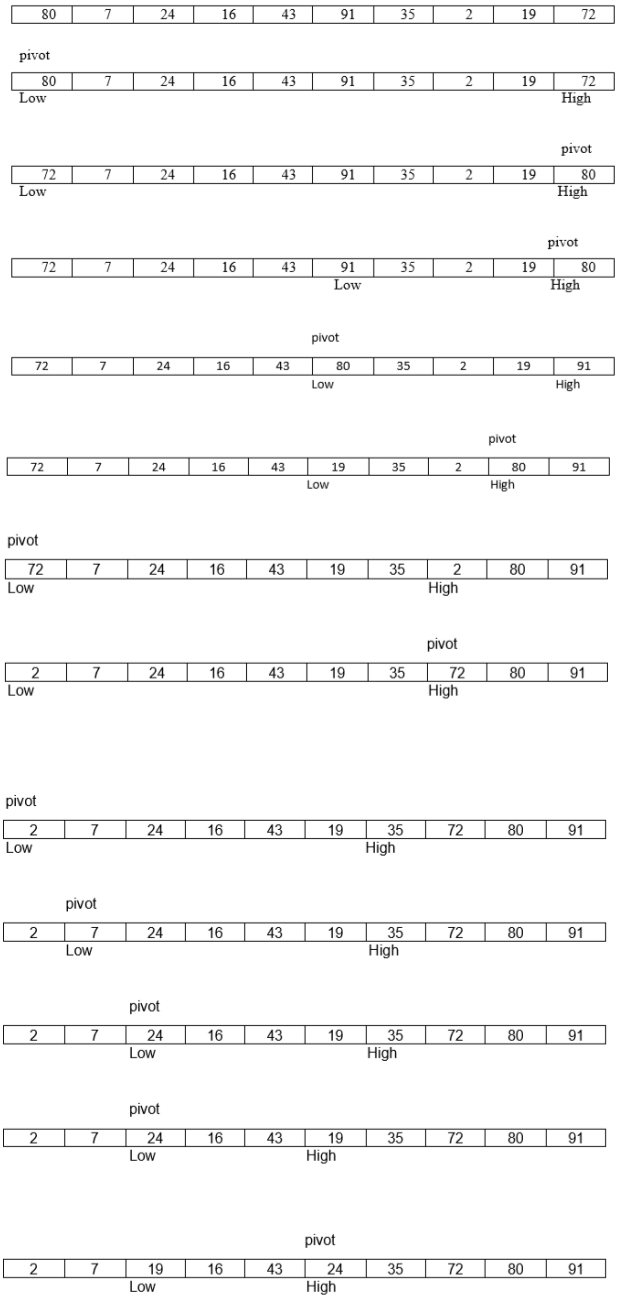
4. A.



B.

QuickSort

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



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.

Modul_6.py - E:\Informatika\Semester 4\Algostruk\Modul_6\Modul_6.py (3.7.3)

File Edit Format Run Options Window Help

```
##nomor5
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)

##nomor6
daftar = [54,26,93,17,77,31,44,55,20]
def quickSort(L, ascending = True):
    quicksorthelp(L, 0, len(L), ascending)
```

Ln: 3 Col: 0

Python 3.7.3 Shell

File Edit Shell Debug Options Window Help

```
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
bubble: 13.8486 detik
selection: 6.09439 detik
insertion: 5.849 detik
merge: 0.103201 detik
quick: 0.0643694 detik
sebelum
 [54, 26, 93, 17, 77, 31, 44, 55, 20]
sesudah
 [17, 20, 26, 31, 44, 54, 55, 77, 93]
sebelum
 [54, 26, 93, 17, 77, 31, 44, 55, 20]
sesudah
 [17, 20, 26, 31, 44, 54, 55, 77, 93]
mergesort           : 0.143615 detik
mergesort terbaru  : 0.161566 detik
quicksort           : 0.0578394 detik
quicksort terbaru  : 0.0698128 detik
List 1 :
16
17
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48
92
List 2 :
10
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23
Mergesort Linked list :
10
16
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18
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33
48
92
>>>
```
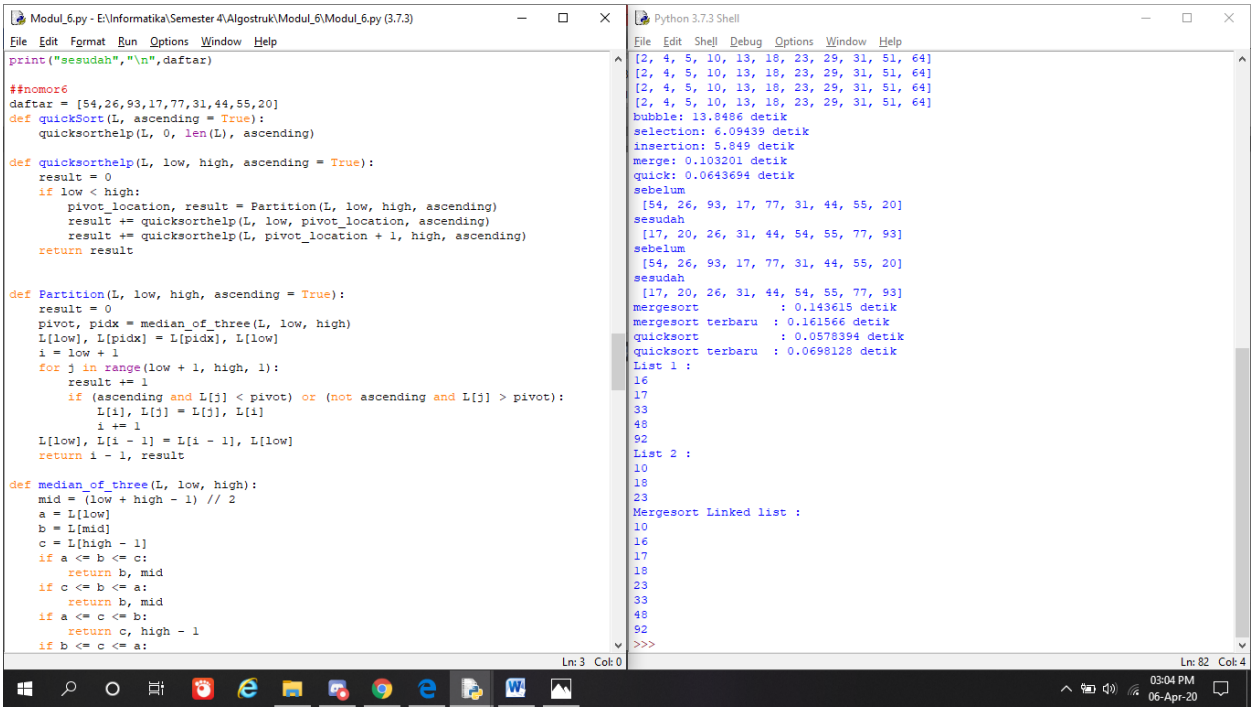

Ln: 82 Col: 4

03:03 PM 06-Apr-20

6.



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

##nomor6
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:
```

```
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
bubble: 13.8486 detik
selection: 6.09439 detik
insertion: 5.849 detik
merge: 0.103201 detik
quick: 0.0643694 detik
sebelum
 [54, 26, 93, 17, 77, 31, 44, 55, 20]
sesudah
 [17, 20, 26, 31, 44, 54, 55, 77, 93]
sebelum
 [54, 26, 93, 17, 77, 31, 44, 55, 20]
sesudah
 [17, 20, 26, 31, 44, 54, 55, 77, 93]
mergesort           : 0.143615 detik
mergesort terbaru  : 0.161566 detik
quicksort           : 0.0578394 detik
quicksort terbaru  : 0.0698128 detik
List 1 :
16
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List 2 :
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Mergesort Linked list :
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18
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33
48
92
>>>
```
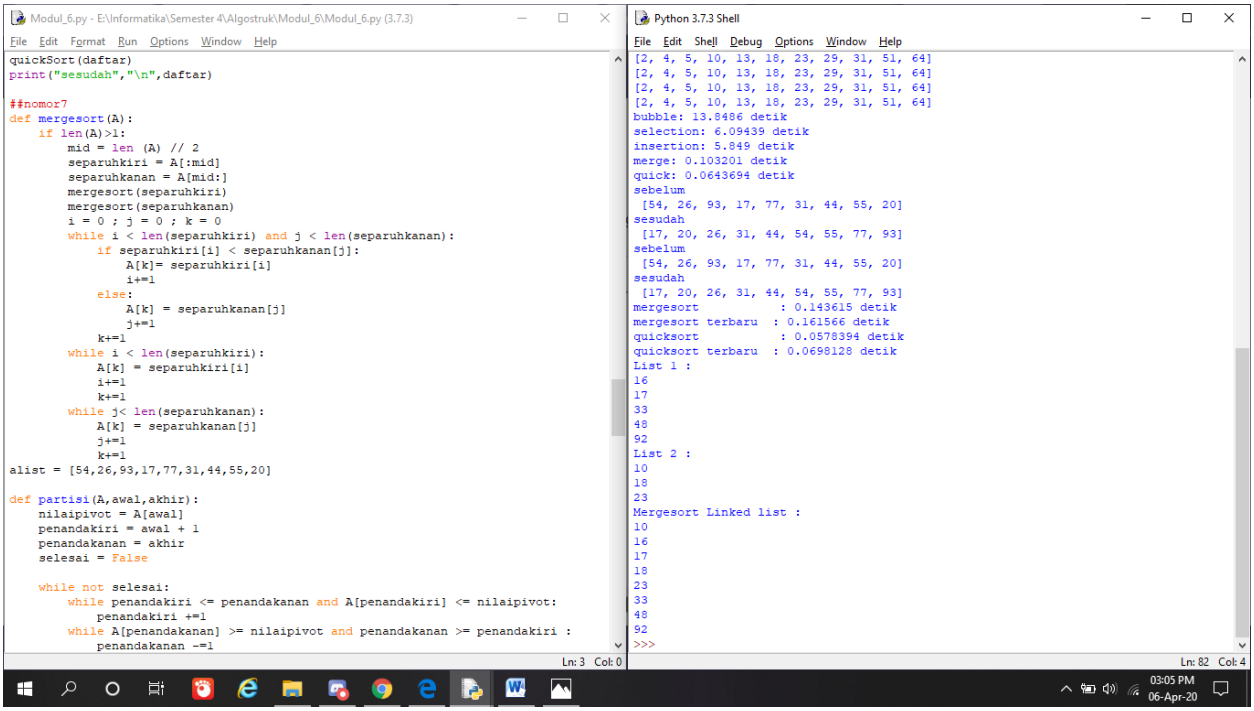

7.



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

##nomor7
def mergesort(A):
    if len(A)>1:
        mid = len (A) // 2
        separuhkiri = A[:mid]
        separuhkanan = A[mid:]
        mergesort(separuhkiri)
        mergesort(separuhkanan)
        i = 0 ; j = 0 ; k = 0
        while i < len(separuhkiri) and j < len(separuhkanan):
            if separuhkiri[i] < separuhkanan[j]:
                A[k]= separuhkiri[i]
                i+=1
            else:
                A[k] = separuhkanan[j]
                j+=1
            k+=1
        while i < len(separuhkiri):
            A[k] = separuhkiri[i]
            i+=1
            k+=1
        while j< len(separuhkanan):
            A[k] = separuhkanan[j]
            j+=1
            k+=1
alist = [54,26,93,17,77,31,44,55,20]

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 +=1
        while A[penandakanan] >= nilaipivot and penandakanan >= penandakiri :
            penandakanan -=1
```

```
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
bubble: 13.8486 detik
selection: 6.09439 detik
insertion: 5.849 detik
merge: 0.103201 detik
quick: 0.0643694 detik
sebelum
 [54, 26, 93, 17, 77, 31, 44, 55, 20]
sesudah
 [17, 20, 26, 31, 44, 54, 55, 77, 93]
sebelum
 [54, 26, 93, 17, 77, 31, 44, 55, 20]
sesudah
 [17, 20, 26, 31, 44, 54, 55, 77, 93]
mergesort           : 0.143615 detik
mergesort terbaru  : 0.161566 detik
quicksort           : 0.0578394 detik
quicksort terbaru  : 0.0698128 detik
List 1 :
16
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92
List 2 :
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23
Mergesort Linked list :
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18
23
33
48
92
>>>
```
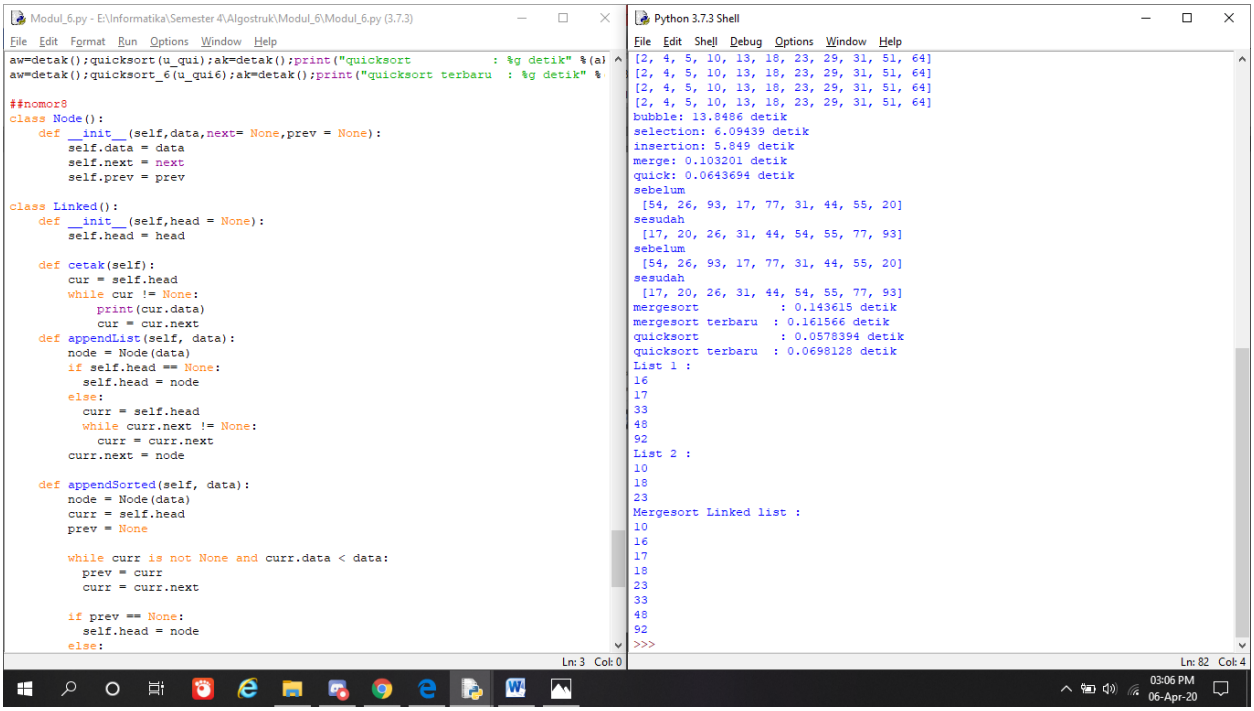

8.


Modul_6.py - E:\Informatika\Semester 4\Algostruk\Modul_6\Modul_6.py (3.7.3)
File Edit Format Run Options Window Help
aw=detak();quicksort(u_qui);ak=detak();print("quicksort : %g detik" %(a)
aw=detak();quicksort_6(u_qui6);ak=detak();print("quicksort terbaru : %g detik" %
##nomor8
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:
Ln: 3 Col: 0
Python 3.7.3 Shell
File Edit Shell Debug Options Window Help
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
bubble: 13.8486 detik
selection: 6.09439 detik
insertion: 5.849 detik
merge: 0.103201 detik
quick: 0.0643694 detik
sebelum
[54, 26, 93, 17, 77, 31, 44, 55, 20]
sesudah
[17, 20, 26, 31, 44, 54, 55, 77, 93]
sebelum
[54, 26, 93, 17, 77, 31, 44, 55, 20]
sesudah
[17, 20, 26, 31, 44, 54, 55, 77, 93]
mergesort : 0.143615 detik
mergesort terbaru : 0.161566 detik
quicksort : 0.0578394 detik
quicksort terbaru : 0.0698128 detik
List 1 :
16
17
33
48
92
List 2 :
10
18
23
Mergesort Linked list :
10
16
17
18
23
33
48
92
>>>
Ln: 82 Col: 4
03:06 PM
06-Apr-20