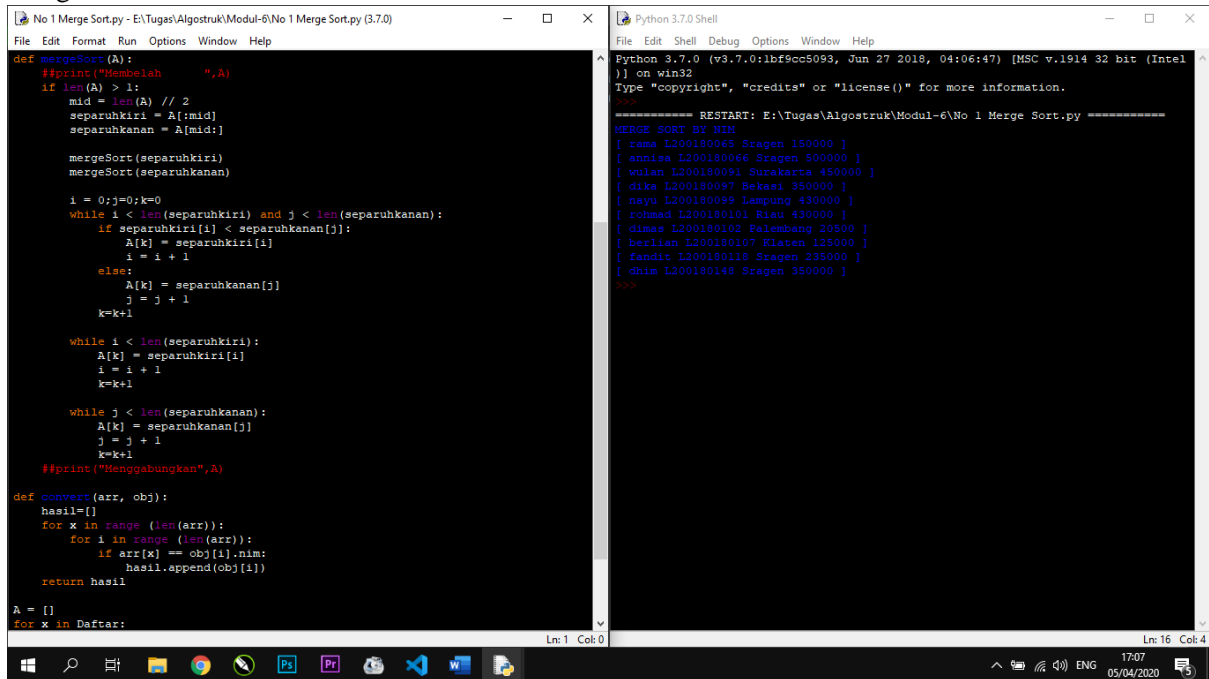


Nama : Wahyu Setyaji Rama Dwijaya  
NIM : L200180065  
Kelas : C

## TUGAS MODUL 6

No 1

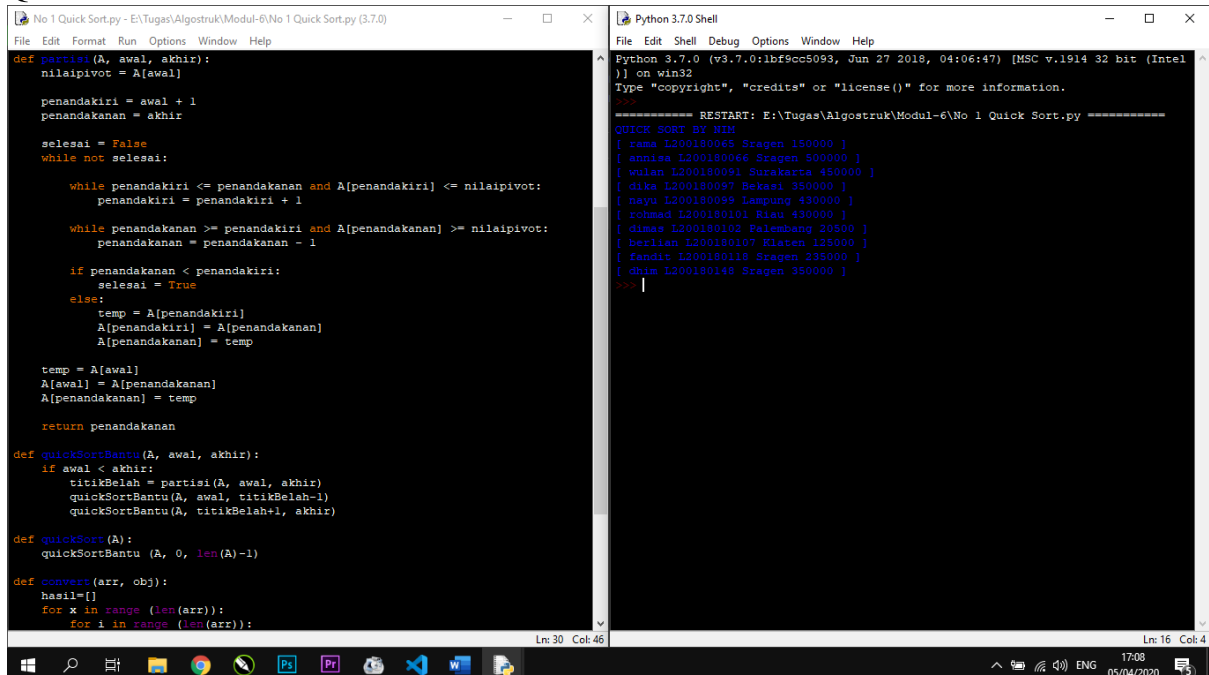
### Merge Sort



```
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help

Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: E:\Tugas\Algostruk\Modul-6\No 1 Merge Sort.py =====
MERGE SORT BY NIM
[ rama L200180065 Sragen 150000 ]
[ annisa L200180066 Sragen 500000 ]
[ wulan L200180091 Surakarta 450000 ]
[ dika L200180097 Bekasi 350000 ]
[ nayu L200180098 Lampung 430000 ]
[ rohmah L200180101 Riau 430000 ]
[ dimas L200180102 Palembang 20500 ]
[ berlian L200180107 Klaten 125000 ]
[ fandi L200180118 Sragen 235000 ]
[ dhim L200180148 Sragen 350000 ]
>>>
```

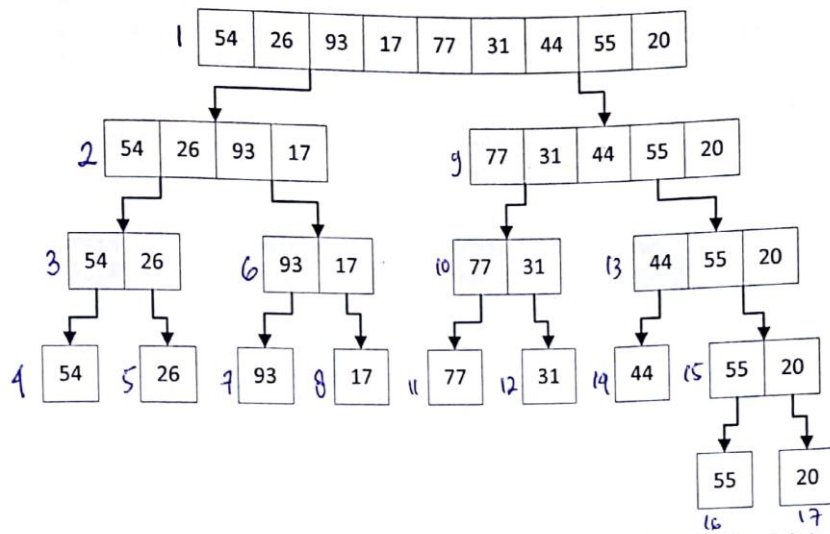
### Quick Sort



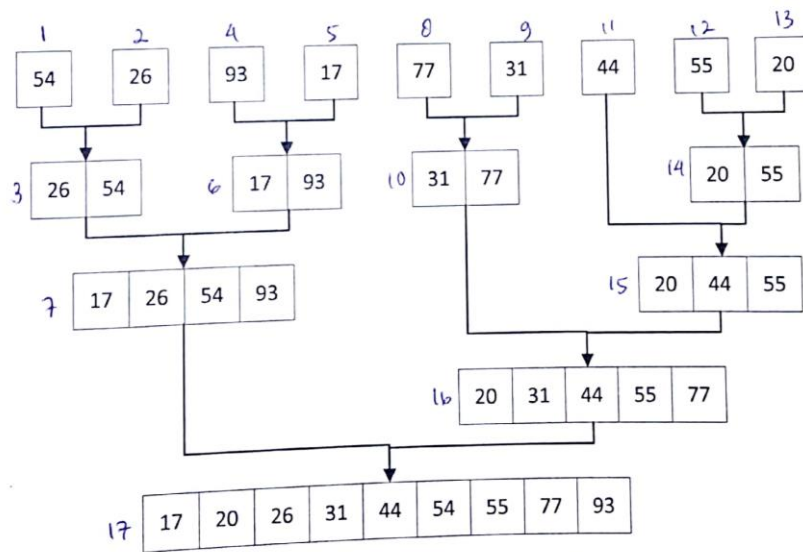
```
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help

Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: E:\Tugas\Algostruk\Modul-6\No 1 Quick Sort.py =====
QUICK SORT BY NIM
[ rama L200180065 Sragen 150000 ]
[ annisa L200180066 Sragen 500000 ]
[ wulan L200180091 Surakarta 450000 ]
[ dika L200180097 Bekasi 350000 ]
[ nayu L200180098 Lampung 430000 ]
[ rohmah L200180101 Riau 430000 ]
[ dimas L200180102 Palembang 20500 ]
[ berlian L200180107 Klaten 125000 ]
[ fandi L200180118 Sragen 235000 ]
[ dhim L200180148 Sragen 350000 ]
>>>
```

No 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.

### No 3

```

No 3.py - E:\Tugas\Algostruk\prak_asd_c-master\prak_asd_c-master\Modul-6\No 3.py (3.7.0)
File Edit Format Run Options Window Help

while penandakanan >= penandakiri and A[penandakanan] >= nilaipivot:
    penandakanan = 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

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

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

|
k = [i for i in range(1, 6001)]
acak(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));

Python 3.7.0 Shell
File Edit Shell Debug Options Window Help

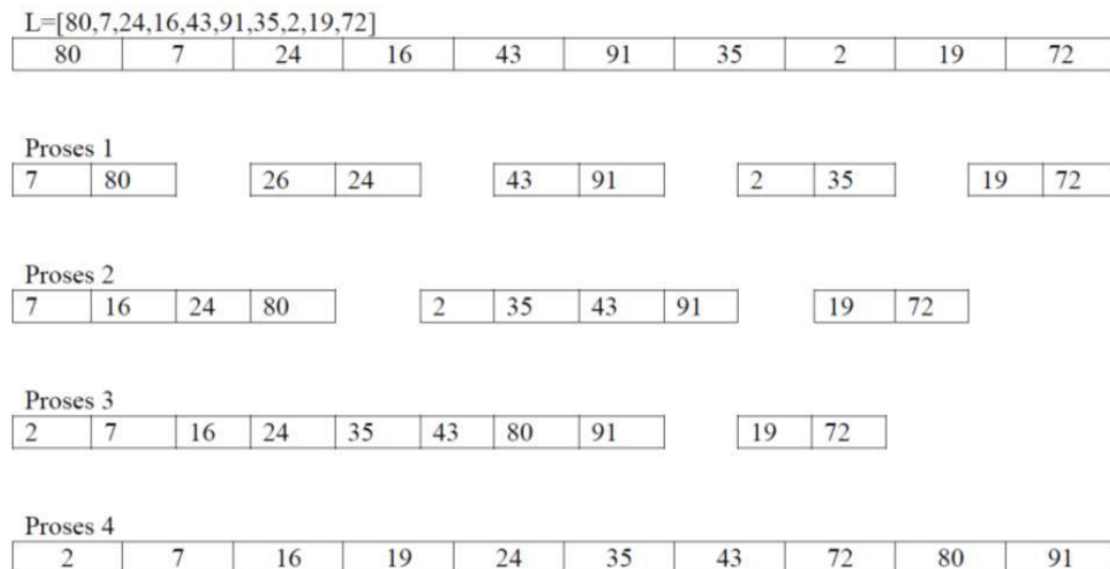
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel
)] on win32
Type "copyright", "credits" or "license()" for more information.

RESTART: E:\Tugas\Algostruk\prak_asd_c-master\prak_asd_c-master\Modul-6\No 3.py
bubble: 0.01005 detik
selection: 4.06216 detik
insertion: 4.29654 detik
merge: 0.0624762 detik
quick: 0.0311582 detik
>>>

```

### No 4

Merge Sort:



## Quick Sort

L=[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

72	7	24	16	43	91	35	2	19	pivot 80
Low									High

72	7	24	16	43	91	35	2	19	pivot 80
				Low					High

72	7	24	16	43	pivot 80	35	2	19	91
				Low					High

72	7	24	16	43	19	35	2	pivot 80	91
				Low				High	

pivot 72	7	24	16	43	19	35	2	80	91
Low							High		

2	7	24	16	43	19	35	pivot 72	80	91
Low							High		

pivot 2	7	24	16	43	19	35	72	80	91
Low						High			

2	pivot 7	24	16	43	19	35	72	80	91
	Low					High			

2	7	pivot 24	16	43	19	35	72	80	91
		Low				High			

2	7	24	pivot 16	43	19	35	72	80	91
		Low			High				

2	7	19	16	43	pivot 24	35	72	80	91
		Low			High				

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

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

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

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

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

## No 5

No 5.py - E:\Tugas\Algostruk\Modul-6\No 5.py (3.7.0)
File Edit Format Run Options Window Help

```

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

    if f <= mid:
        tmp[a:] = A[f:mid+1]

    if l <= akhir:
        tmp[a:] = A[l:akhir+1]

    a = 0
    while awal <= akhir:
        A[awal] = tmp[a]
        awal += 1
        a += 1

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

def convert(arr, obj):
    hasil = []
    for i in range(len(arr)):
        for j in range(len(obj)):
            if arr[i] == obj[j].nim:
                hasil.append(obj[j])
    return hasil

A = []

```

Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.

>>>
===== RESTART: E:\Tugas\Algostruk\Modul-6\No 5.py =====
MERGE SORT v2 BY NIM
[ rama L200180065 Sragen 150000 ]
[ annisa L200180066 Sragen 500000 ]
[ wulan L200180091 Surakarta 450000 ]
[ dika L200180097 Bekasi 350000 ]
[ nayu L200180099 Lampung 430000 ]
[ rohmah L200180101 Riau 430000 ]
[ dimas L200180102 Palembang 20500 ]
[ berlian L200180107 Klaten 125000 ]
[ fandit L200180118 Sragen 235000 ]
[ dhim L200180148 Sragen 350000 ]
>>>

Ln: 66 Col: 20
Ln: 16 Col: 4
17:13 05/04/2020

## No 6

The screenshot shows a Python 3.7.0 IDE with two windows. The left window displays a Python script for a quicksort algorithm. The right window shows the output of the script, which includes a list of names and their corresponding values, followed by a restart command and the execution of the quicksort function.

```

def partisi(A, awal, akhir):
    hasil = 0
    pivot, pidx = median_dari_tiga(A, awal, akhir)
    A[awal], A[pidx] = A[pidx], A[awal]
    i = awal + 1
    for j in range(awal+1, akhir, 1):
        hasil += 1
        if (A[j] < pivot):
            A[i], A[j] = A[j], A[i]
            i += 1
    A[awal], A[i-1] = A[i-1], A[awal]
    return i - 1, hasil

def median_dari_tiga(A, awal, akhir):
    tengah = (awal+akhir-1)//2
    a = A[awal]
    b = A[tengah]
    c = A[akhir-1]
    if a <= b <= c:
        return b, tengah
    if c <= b <= a:
        return b, tengah
    if a <= c <= b:
        return c, akhir-1
    if b <= c <= a:
        return c, akhir-1
    return a, awal

def quickSortBantu(A, awal, akhir):
    hasil = 0
    if awal < akhir:
        titikBelah, hasil = partisi(A, awal, akhir)
        hasil += quickSortBantu(A, awal, titikBelah)
        hasil += quickSortBantu(A, titikBelah + 1, akhir)
    return hasil

def quickSort(A):
    quickSortBantu(A, 0, len(A))

def convert(arr, obj):
    ...

```

The output window shows the following data:

```

===== RESTART: E:\Tugas\Algostruk\Modul-6\No 6.py =====
QUICK SORT v2 BY NIM
[ rama L200180065 Sragen 150000 ]
[ annisa L200180066 Sragen 500000 ]
[ wulan L200180091 Surakarta 450000 ]
[ dika L200180097 Bekasi 350000 ]
[ nayu L200180098 Lampung 430000 ]
[ rohmah L200180101 Riau 430000 ]
[ dimas L200180102 Palembang 20500 ]
[ berlian L200180107 Medan 125000 ]
[ fandi L200180118 Sragen 235000 ]
[ dhim L200180148 Sragen 350000 ]
>>>

```

## No 7

The screenshot shows a Python 3.7.0 IDE with two windows. The left window displays a Python script for a merge sort algorithm. The right window shows the output of the script, which includes a list of names and their corresponding values, followed by a restart command and the execution of the merge sort function.

```

A[awal], A[i-1] = A[i-1], A[awal]
return i - 1, hasil

def median_dari_tiga(A, awal, akhir):
    tengah = (awal+akhir-1)//2
    a = A[awal]
    b = A[tengah]
    c = A[akhir-1]
    if a <= b <= c:
        return b, tengah
    if c <= b <= a:
        return b, tengah
    if a <= c <= b:
        return c, akhir-1
    if b <= c <= a:
        return c, akhir-1
    return a, awal

def quickSortBantuNew(A, awal, akhir):
    hasil = 0
    if awal < akhir:
        titikBelah, hasil = partisiNew(A, awal, akhir)
        hasil += quickSortBantuNew(A, awal, titikBelah)
        hasil += quickSortBantuNew(A, titikBelah + 1, akhir)
    return hasil

def quickSortNew(A):
    quickSortBantuNew(A, 0, len(A))

k = [[i] for i in range(1, 6001)]
kacak(k)
u_mrg = k[:]
u_qck = k[:]
u_mrgNew = k[:]
u_qckNew = k[:]

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));
aw=detak();mergeSortNew(u_mrgNew);ak=detak();print("merge v2: %g detik" % (ak-aw));
aw=detak();quickSortNew(u_qckNew);ak=detak();print("quick v2: %g detik" % (ak-aw));

```

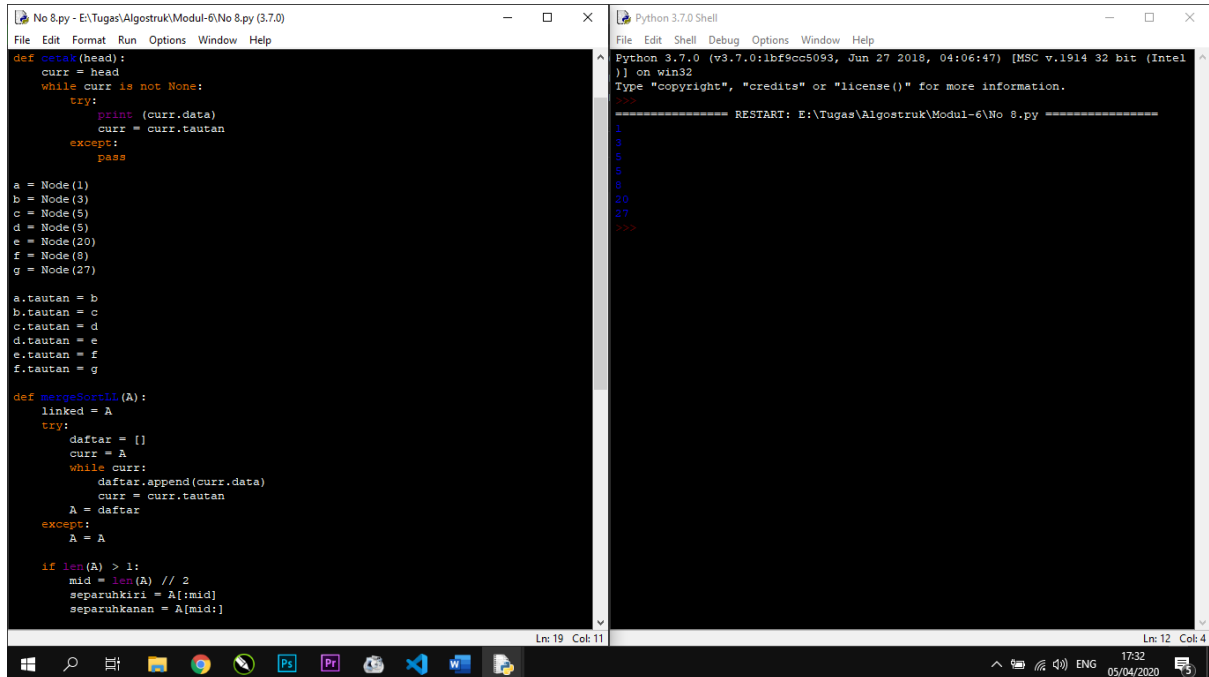
The output window shows the following data:

```

===== RESTART: E:\Tugas\Algostruk\Modul-6\No 7.py =====
merge: 0.0624935 detik
quick: 0.0311942 detik
merge v2: 0.0937426 detik
quick v2: 0.046818 detik
>>>

```

## No 8



The image shows a screenshot of a Python 3.7.0 IDE with two windows. The left window, titled 'No 8.py - E:\Tugas\Algostruk\Modul-6\No 8.py (3.7.0)', contains the following Python code:

```
def cetak(head):
    curr = head
    while curr is not None:
        try:
            print(curr.data)
            curr = curr.tautan
        except:
            pass

a = Node(1)
b = Node(3)
c = Node(5)
d = Node(5)
e = Node(20)
f = Node(8)
g = Node(27)

a.tautan = b
b.tautan = c
c.tautan = d
d.tautan = e
e.tautan = f
f.tautan = g

def mergeSortLL(A):
    linked = A
    try:
        daftar = []
        curr = A
        while curr:
            daftar.append(curr.data)
            curr = curr.tautan
        A = daftar
    except:
        A = A

    if len(A) > 1:
        mid = len(A) // 2
        separuhkiri = A[:mid]
        separuhkanan = A[mid:]
```

The right window, titled 'Python 3.7.0 Shell', shows the output of the program. It displays the path to the file being executed, followed by a list of numbers: 1, 3, 5, 5, 20, 27. The output is as follows:

```
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: E:\Tugas\Algostruk\Modul-6\No 8.py =====
1
3
5
5
20
27
>>>
```

The taskbar at the bottom shows the Windows Start button, search icon, and several open applications including File Explorer, Google Chrome, and various productivity tools. The system clock in the bottom right corner indicates the time is 17:32 on 05/04/2020.