LAPORAN PRAKTIKUM MODUL 6

ALGORITMA DAN STRUKTUR DATA

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1.

Soal1.py - D:\Sekolah\INFORMATIKA ALDY\Praktikum Algostruk\Modul 6\Soal1.py (3.8.2)

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```
class MhsTIF:
    def __init__(self, nama, NIM, kota, us):
        self.nama = nama
        self.NIM = NIM
        self.kota = kota
        self.uang = us
    def __str__ (self) :
        s = self.nama + " " + str(self.NIM) + " " + self.kota + " " + str(self.uang)
        return s


m0 = MhsTIF("Aldy", 17, "jakarta", 240000)
m1 = MhsTIF("Fatwa", 11, "bandung", 230000)
m2 = MhsTIF("Fakhar", 12, "Surakarta", 250000)
m3 = MhsTIF("Erdi", 12, "Surakarta", 235000)
m4 = MhsTIF("Hanan", 13, "papua", 240000)
m5 = MhsTIF("Rizki", 99, "kendari", 250000)
m6 = MhsTIF("iqbal", 90, "Riau", 245000)
m7 = MhsTIF("ijul", 67, "padang", 245000)
m8 = MhsTIF("fikri", 45, "Sorong", 245000)
m9 = MhsTIF("wafiq", 00, "sumba", 270000)
m10 = MhsTIF("kevin", 12, "wonogiri", 265000)

Daftar = [m0, m1, m2, m3, m4, m5, m6, m7, m8, m9, m10]

def mergeSort(A):
    #print("Membelah      ",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 = i + 1
            else:
                A[k] = separuhkanan[j]
                j = j + 1
            k=k+1

        while i < len(separuhkiri):
            A[k] = separuhkiri[i]
```

Soal1.py - D:\Sekolah\INFORMATIKA ALDY\Praktikum Algostruk\Modul 6\Soal1.py (3.8.2)

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```
            while i < len(separuhkiri):
                A[k] = separuhkiri[i]
                i = i + 1
                k=k+1

            while j < len(separuhkanan):
                A[k] = separuhkanan[j]
                j = j + 1
                k=k+1
        #print("Menggabungkan",A)


def quickSort(A, awal, akhir):
    if awal < akhir:
        titikBelah = partisi(A, awal, akhir)
        quickSort(A, awal, titikBelah-1)
        quickSort(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 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 convert(arr, obj):
```

Soal1.py - D:\Sekolah\INFORMATIKA ALDY\Praktikum Algostruk\Modul 6\Soal1.py (3.8.2)

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```
            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 convert(arr, obj):
    hasil=[]
    for x in range (len(arr)):
        for i in range (len(arr)):
            if arr[x] == obj[i].NIM:
                hasil.append(obj[i])
    return hasil

def printMerge(arr):
    print("hasil merge sort")
    NIM = []
    for i in arr:
        NIM.append(i.NIM)
    mergeSort(NIM)
    for x in convert(NIM, arr):
        print(x.NIM)



def printQuick(arr):
    print("\nhasil quick sort")
    A = []
    for x in Daftar:
        A.append(x.NIM)

    quickSort(A, 0, len(A)-1)
    for x in convert(A, Daftar):
        print (x.NIM)

printMerge(Daftar)
printQuick(Daftar)
```

Python 3.8.2 Shell

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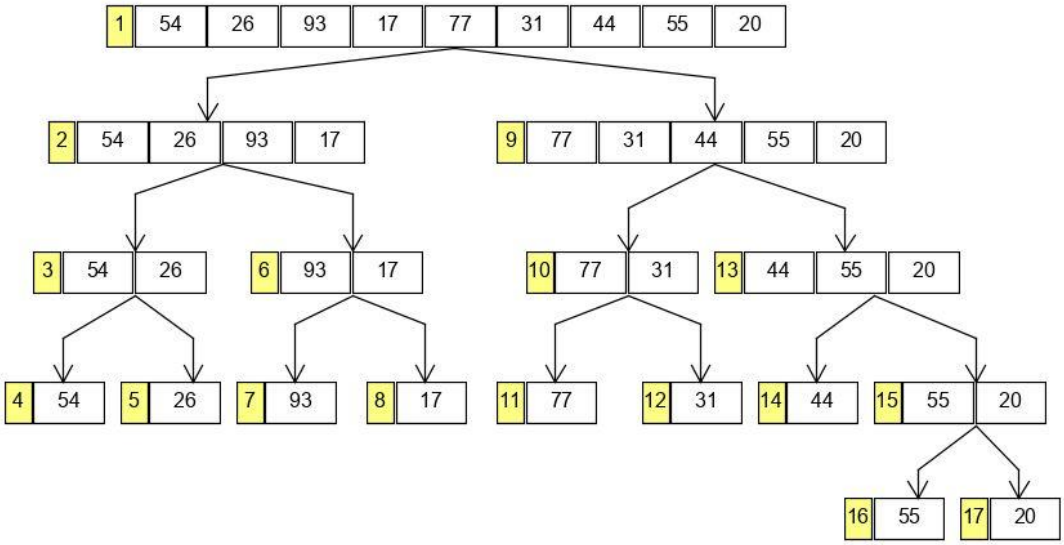
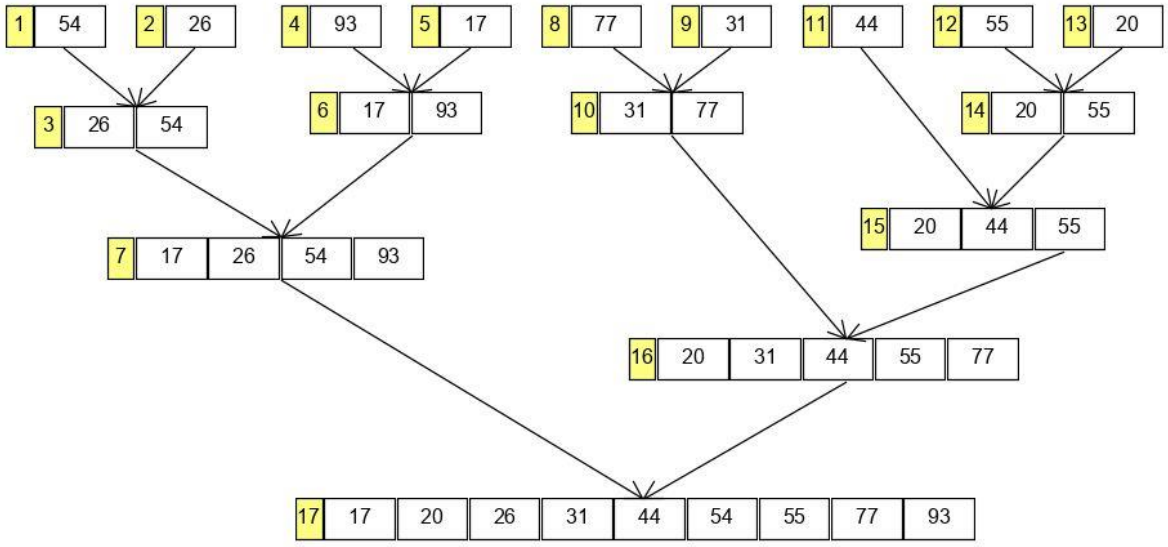
```
>>>
=== RESTART: D:\Sekolah\INFORMATIKA ALDY\Pr
hasil merge sort
0
11
12
12
12
12
12
12
12
12
12
13
17
45
67
90
99

hasil quick sort
0
11
12
12
12
12
12
12
12
12
12
13
17
45
67
90
99
>>>
```

2.


1 54 26 93 17 77 31 44 55 20
2 54 26 93 17
9 77 31 44 55 20
3 54 26
6 93 17
10 77 31
13 44 55 20
4 54
5 26
7 93
8 17
11 77
12 31
14 44
15 55 20
16 55
17 20


1 54
2 26
4 93
5 17
8 77
9 31
11 44
12 55
13 20
3 26 54
6 17 93
10 31 77
14 20 55
7 17 26 54 93
15 20 44 55
16 20 31 44 55 77
17 17 20 26 31 44 54 55 77 93

3.

Soal3.py - D:\Sekolah\INFORMATIKA ALDY\Praktikum Algostruk\Modul 6\Soal3.py (3.8.2)

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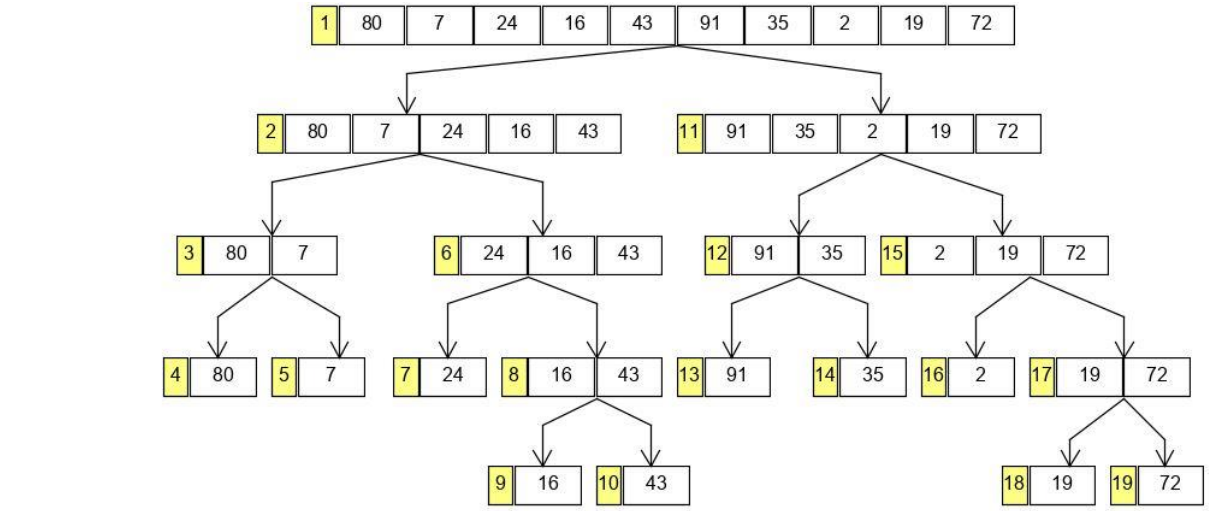
```
k = list(range(6000))
kocok(k)
u_bub = k[:]
u_sel = k[:]
u_ins = k[:]
u_mrg = k[:]
u_qck = k[:]

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 = detak();insertionSort(u_ins);ak = detak();print('insertion : %g detik' %(ak
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));
```

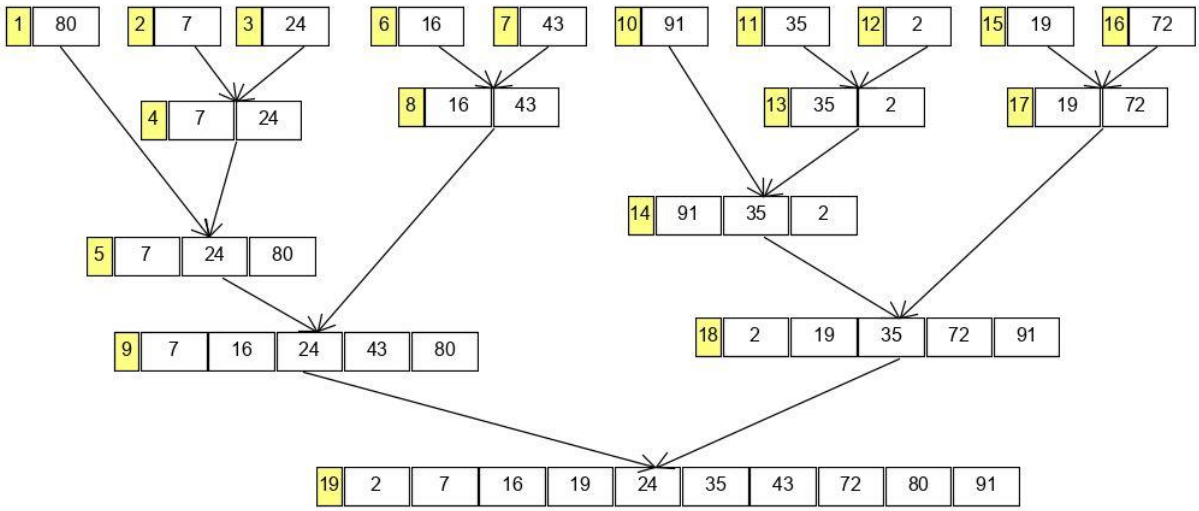
Python 3.8.2 Shell

File Edit Shell Debug Options Window Help

```
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 22:45:29) [MSC v.1916 32 bit (In
tel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
=== RESTART: D:\Sekolah\INFORMATIKA ALDY\Praktikum Algostruk\Modul 6\Soal3.py ==
bubble : 5.07426 detik
selection : 1.9657 detik
insertion : 2.27213 detik
merge : 0.029289 detik
quick : 0.0204966 detik
>>>
```

4.


1 80 7 24 16 43 91 35 2 19 72
2 80 7 24 16 43
11 91 35 2 19 72
3 80 7
6 24 16 43
12 91 35
15 2 19 72
4 80
5 7
7 24
8 16 43
13 91
14 35
16 2
17 19 72
9 16
10 43
18 19
19 72


1 80
2 7
3 24
6 16
7 43
10 91
11 35
12 2
15 19
16 72
4 7 24
8 16 43
13 35 2
17 19 72
14 91 35 2
5 7 24 80
9 7 16 24 43 80
18 2 19 35 72 91
19 2 7 16 19 24 35 43 72 80 91

5.

Soal5.py - D:\Sekolah\INFORMATIKA ALDY\Praktikum Algostruk\Modul 6\Soal5.py (3.8.2)

File Edit Format Run Options Window Help

```
m9 = MhsTIF("wafiq", 00, "sumba", 270000)
m10 = MhsTIF("kevin", 12, "wonogiri", 265000)

Daftar = [m0, m1, m2, m3, m4, m5, m6, m7, m8, m9, m10]


def cetak(A):
    for i in A:
        print (i)

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].ambilUangSaku() < A[l].ambilUangSaku():
            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)

print("Sebelum diurutkan")
cetak(Daftar)
mergeSort(Daftar)
print("\nSeletah diurutkan")
cetak(Daftar)
```

Python 3.8.2 Shell

File Edit Shell Debug Options Window

```
Python 3.8.2 (tags/v3.8.2:7b3ab5
tel)] on win32
Type "help", "copyright", "credi
>>>
=== RESTART: D:\Sekolah\INFORMAT
Sebelum diurutkan
Aldy 17 jakarta 240000
Fatwa 11 bandung 230000
Fakhar 12 Surakarta 250000
Erdi 12 Surakarta 235000
Hanan 13 papua 240000
Rizki 99 kendari 250000
iqbal 90 Riau 245000
ijul 67 padang 245000
fikri 45 Sorong 245000
wafiq 0 sumba 270000
kevin 12 wonogiri 265000

Seletah diurutkan
Fatwa 11 bandung 230000
Erdi 12 Surakarta 235000
Hanan 13 papua 240000
Aldy 17 jakarta 240000
fikri 45 Sorong 245000
ijul 67 padang 245000
iqbal 90 Riau 245000
Rizki 99 kendari 250000
Fakhar 12 Surakarta 250000
kevin 12 wonogiri 265000
wafiq 0 sumba 270000
>>>
```

Ln: 1 Col: 0

6.

Soal6.py - D:\Sekolah\INFORMATIKA ALDY\Praktikum Algostruk\Modul 6\Soal6.p

File Edit Format Run Options Window Help

```
m6 = MhsTIF("iqbal", 90, "Riau", 245000)
m7 = MhsTIF("ijul", 67, "padang", 245000)
m8 = MhsTIF("fikri", 45, "Sorong", 245000)
m9 = MhsTIF("wafiq", 00, "sumba", 270000)
m10 = MhsTIF("kevin", 12, "wonogiri", 265000)

Daftar = [m0, m1, m2, m3, m4, m5, m6, m7, m8, m9, m10]
A = []
for i in Daftar:
    A.append(i.nama)

def cetak():
    for i in A:
        print(i)

def quickSort(arr):
    kurang = []
    pivotList = []
    lebih = []
    if len(arr) <= 1:
        return arr
    else:
        pivot = arr[0]
        for i in arr:
            if i < pivot:
                kurang.append(i)
            elif i > pivot:
                lebih.append(i)
            else:
                pivotList.append(i)
        kurang = quickSort(kurang)
        lebih = quickSort(lebih)
        return kurang + pivotList + lebih

print("Sebelum diurutkan")
cetak()
print("\nSetelah diurutkan")
quickSort(A)
cetak()
```

Python 3.8.2 Shell

File Edit Shell Debug Options

```
Python 3.8.2 (tags/v3.8.2
tel)] on win32
Type "help", "copyright",
>>>
=== RESTART: D:\Sekolah\I
Sebelum diurutkan
Aldy
Fatwa
Fakhar
Erdi
Hanan
Rizki
iqbal
ijul
fikri
wafiq
kevin

Setelah diurutkan
Aldy
Fatwa
Fakhar
Erdi
Hanan
Rizki
iqbal
ijul
fikri
wafiq
kevin
>>>
```

7.

Soal7.py - D:\Sekolah\INFORMATIKA ALDY\Praktikum Algostruk\Modul 6\Soal7.py (3.8.2)

File Edit Format Run Options Window Help

```
k =  list(range(6000))
kocok(k)
u_bub = k[:]
u_sel = k[:]
u_ins = k[:]
u_mrg = k[:]
u_qck = k[:]
u_mrgNew = k[:]
u_qckNew = 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 = detak();insertionSort(u_ins);ak = detak();print('insertion : %g detik' %(ak
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 New: %g detik" %(ak-aw
aw=detak();quickSortNew(u_qckNew);ak=detak();print("quick New: %g detik" %(ak-aw
```

Python 3.8.2 Shell

File Edit Shell Debug Options Window Help

```
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 22:45:29) [MSC v.1916 32 bit (In
tel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
=== RESTART: D:\Sekolah\INFORMATIKA ALDY\Praktikum Algostruk\Modul 6\Soal7.py ==
bubble : 5.03715 detik
selection : 1.98226 detik
insertion : 2.3317 detik
merge: 0.0312772 detik
quick: 0.0215065 detik
merge New: 0.0439544 detik
quick New: 0.0117114 detik
>>>
```

Ln: 11 Col: 26

8.

Soal8.py - D:\Sekolah\INFORMATIKA ALDY\Praktikum Algostruk\Modul 6\Soal8.py (3.8.2)

File Edit Format Run Options Window Help

```
class Node():
    def __init__(self, data, isi=None):
        self.data = data
        self.isi = isi

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

a = Node(10)
b = Node(30)
c = Node(50)
d = Node(70)
e = Node(20)
f = Node(40)
g = Node(60)

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

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

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

        mergeSortll(separuhkiri)
        mergeSortll(separuhkanan)
```

Soal8.py - D:\Sekolah\INFORMATIKA ALDY\Praktikum Algostruk\Modul 6\Soal8.py (3.8.2)

File Edit Format Run Options Window Help

```
        i = 0;j=0;k=0
        while i < len(separuhkiri) and j < len(separuhkanan):
            if separuhkiri[i] < separuhkanan[j]:
                A[k] = separuhkiri[i]
                i = i + 1
            else:
                A[k] = separuhkanan[j]
                j = j + 1
            k=k+1

        while i < len(separuhkiri):
            A[k] = separuhkiri[i]
            i = i + 1
            k=k+1

        while j < len(separuhkanan):
            A[k] = separuhkanan[j]
            j = j + 1
            k=k+1

    for x in A:
        try:
            linked.data = x
            linked = linked.isi
        except:
            pass

mergeSortll(a)
cetak(a)
```

Ln: 17 Col: 12

Python 3.8.2 Shell

File Edit Shell Debug Options Win

```
Python 3.8.2 (tags/v3.8.2:7b
tel)] on win32
Type "help", "copyright", "c
>>>
=== RESTART: D:\Sekolah\INFO
10
20
30
40
50
60
70
>>>
```