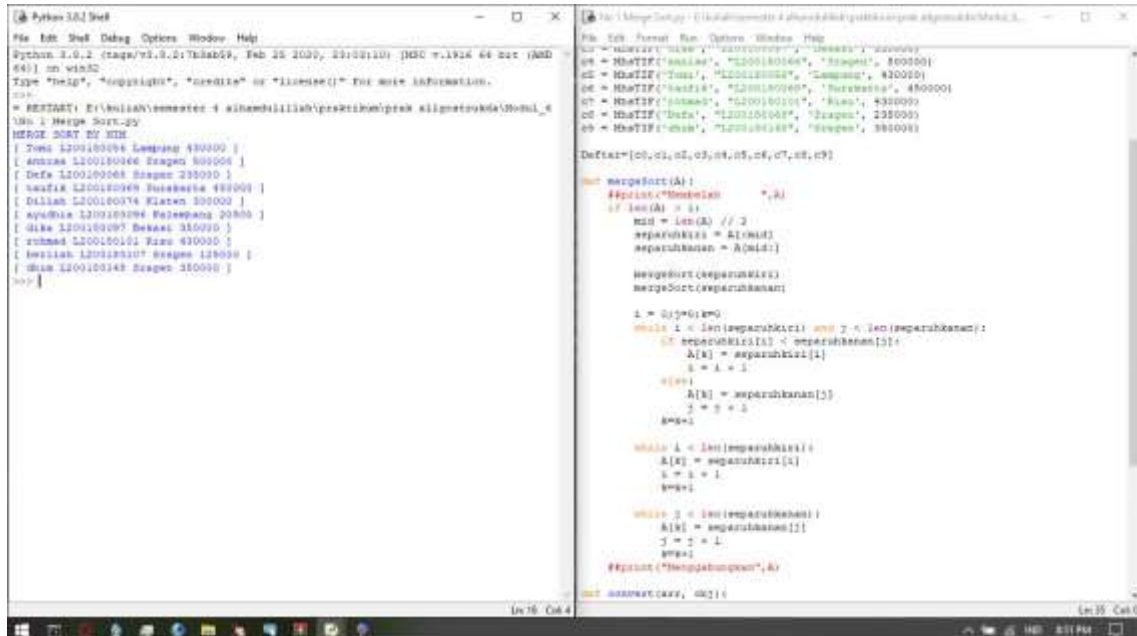


Nama : Defa Raffy Z.R  
NIM : L200180068  
Kelas : C

## TUGAS PRAKTIKUM ALGORITMA MODUL 6

No 1

### Merge Sort



```
Python 3.8.2 Shell
File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:7b8b3f9, Feb 25 2020, 23:08:10) [AMD64] on win32
Type "help", "copyright()", "credits()" or "license()" for more information.
>>>
# RESTART: Er:\nolan\semester 4\informatika\praktikum\prk algoritma\Modul_6
>>>
# Merge Sort.py
MERGE SORT BY NIM
[ Tomi L200180094 Lampung 430000 ]
[ Arizna L200180066 Sragen 300004 ]
[ Defa L200180068 Sragen 230030 ]
[ Naufia L200180069 Pekanbaru 480000 ]
[ Dillan L200180074 Klaten 300000 ]
[ Ayahia L200180096 Pekanbaru 20000 ]
[ Dika L200180097 Bekasi 310030 ]
[ Ruzma L200180101 Wiro 430000 ]
[ Ismail L200180107 Sragen 120000 ]
[ Dhu L200180148 Sragen 310000 ]
>>>

Python 3.8.2 Shell
File Edit Shell Debug Options Window Help
# Merge Sort.py - C:\Users\nolan\Documents\praktikum\prk algoritma\Modul_6
>>>
# Merge Sort.py
# Merge Sort
def mergeSort(A):
    #print("Memulai ", A)
    if len(A) < 2:
        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]
            i = i + 1
            k = k + 1
        while j < len(separuhKanan):
            A[k] = separuhKanan[j]
            j = j + 1
            k = k + 1
        #print("Menggabungkan", A)
    return A
def main():
    A = [430000, 300004, 230030, 480000, 300000, 20000, 310030, 430000, 120000, 310000]
    mergeSort(A)
    print(A)
```

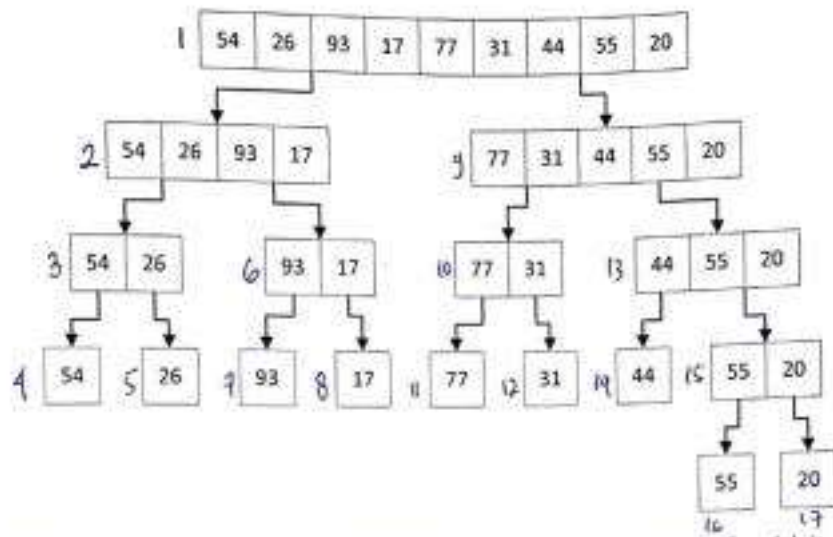
### Quick Sort



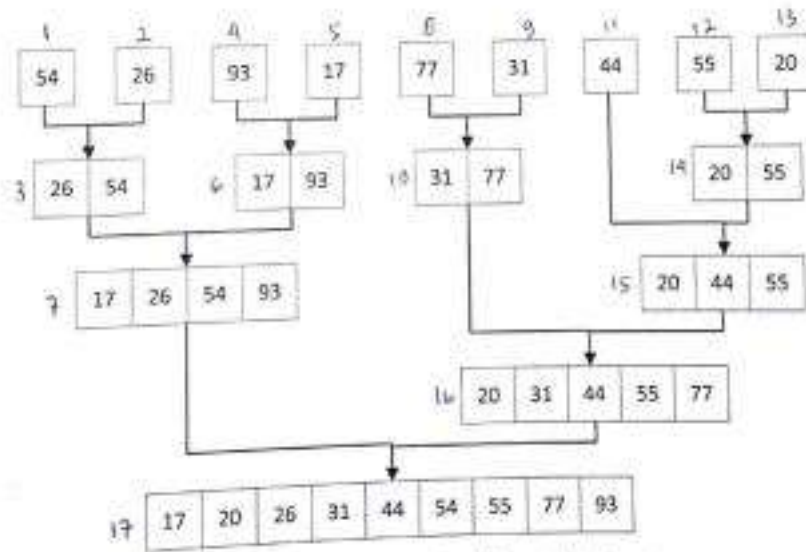
```
Python 3.8.2 Shell
File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:7b8b3f9, Feb 25 2020, 23:08:10) [AMD64] on win32
Type "help", "copyright()", "credits()" or "license()" for more information.
>>>
# RESTART: Er:\nolan\semester 4\informatika\praktikum\prk algoritma\Modul_6
>>>
# Quick Sort.py
QUICK SORT BY NIM
[ Tomi L200180094 Lampung 430000 ]
[ Arizna L200180066 Sragen 300004 ]
[ Defa L200180068 Sragen 230030 ]
[ Naufia L200180069 Pekanbaru 480000 ]
[ Dillan L200180074 Klaten 300000 ]
[ Ayahia L200180096 Pekanbaru 20000 ]
[ Dika L200180097 Bekasi 310030 ]
[ Ruzma L200180101 Wiro 430000 ]
[ Ismail L200180107 Sragen 120000 ]
[ Dhu L200180148 Sragen 310000 ]
>>>

Python 3.8.2 Shell
File Edit Shell Debug Options Window Help
# Quick Sort.py - C:\Users\nolan\Documents\praktikum\prk algoritma\Modul_6
>>>
# Quick Sort.py
# Quick Sort
def quickSort(A, awal, akhir):
    if awal < akhir:
        titikBelah = partisi(A, awal, akhir)
        quickSort(A, awal, titikBelah-1)
        quickSort(A, titikBelah+1, akhir)
    return A
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 penandaKiri < penandaKanan:
            temp = A[penandaKiri]
            A[penandaKiri] = A[penandaKanan]
            A[penandaKanan] = temp
        temp = A[awal]
        A[awal] = A[penandaKanan]
        A[penandaKanan] = temp
    return penandaKanan
def quickSortRecursi(A, awal, akhir):
    if awal < akhir:
        titikBelah = partisi(A, awal, akhir)
        quickSortRecursi(A, awal, titikBelah-1)
        quickSortRecursi(A, titikBelah+1, akhir)
    return A
def main():
    A = [430000, 300004, 230030, 480000, 300000, 20000, 310030, 430000, 120000, 310000]
    quickSortRecursi(A, 0, len(A)-1)
    print(A)
```

No 2



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



Gambar 6.2: Menggabungkan list satu demi satu.

No 3

```
Python 3.6.2 Shell Options Window Help
Python 3.6.2 (tags/v3.6.2:7b51f3e, Feb 20 2020, 23:03:10) [AMD64] on win32
Type "help()", "copyright()", "credits()" or "license()" for more information.
>>>
>>> RESTART: Er:\kalian\semester 4\simbulillahipratrikrihompipak aligetrakode\Modul_4
>>> UBU 4-23
jumlah: 12.8413 detik
selisihawal: 6.74293 detik
insertion: 8.9483 detik
merge: 8.0495147 detik
quick: 8.0495316 detik
>>>
```

No 4

### Merge Sort:

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

Proses 1

7	80	26	24	43	91	2	35	19	72
---	----	----	----	----	----	---	----	----	----

Proses 2

7	16	24	80
---	----	----	----

2	35	43	91
---	----	----	----

19	72
----	----

### Proses 3

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

Proscs 4

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

## 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	80
----	---	----	----	----	----	----	---	----	----

Low

High

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

Low

High

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

Low

High

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

Low

High

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

Low

High

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

Low

High

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

Low

High

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

Low

High

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

Low

High

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

Low

High

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
---	---	----	----	----	----	----	----	----	----

No 5

```

Python 3.6.1 Shell
File Edit Shell Debug Options Window Help
Python 3.6.1 (tags/v3.6.1:7b2b2b5, Feb 25 2020, 23:02:10) [AMD64] on win32
Type "help", "copyright()", "credits()" or "license()" for more information.
>>>
= RESTART: E:\kollan\semester 4\alhamdulillah\praktikum\praktikum algoritma\data\modul_4\mod_4.py
MERGE SORT v0 BY KIN
[ Tomi 1200100094 Lampung 40000 ]
[ Anissa 1200100046 Serang 30000 ]
[ Dafa 1200100068 Serang 20000 ]
[ Hafid 1200100098 Sukabumi 40000 ]
[ Diliyah 1200100074 Klantan 30000 ]
[ ayudhia 1200100096 Pekanbaru 20000 ]
[ Aika 1200100097 Bekasi 30000 ]
[ ruzmah 1200100161 Batu 40000 ]
[ Izzillah 1200100107 Serang 12000 ]
[ Shira 1200100148 Serang 30000 ]
>>>

class NodeTIF(object):
    def __init__(self, nama, nim, tinggali, us):
        self.nama = nama
        self.nim = nim
        self.tinggali = tinggali
        self.us = us

c0 = NodeTIF("Diliyah", "1200100074", "Klantan", 30000)
c1 = NodeTIF("ayudhia", "1200100096", "Pekanbaru", 20000)
c2 = NodeTIF("Anissa", "1200100046", "Pekalongan", 20000)
c3 = NodeTIF("Hafid", "1200100098", "Bekasi", 30000)
c4 = NodeTIF("Tomi", "1200100094", "Serang", 40000)
c5 = NodeTIF("Ruzmah", "1200100161", "Sukabumi", 40000)
c6 = NodeTIF("Shira", "1200100148", "Serang", 30000)
c7 = NodeTIF("Izzillah", "1200100107", "Batu", 40000)

Daftar = [c0, c1, c2, c3, c4, c5, c6, c7, c8, c9]

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]
    elif l <= akhir:
        tmp[a:] = A[l:akhir+1]
    A[awal:akhir+1] = tmp
  
```

## No 6

```

Python 3.8.2 Shell
File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:7b3b59, Feb 25 2020, 23:03:10) [AMD64] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: E:\kuliahan\semester 4\alhamdulillah\praktikum\praktikum algoritma\data\Modul_4
\U0177-02
QUICK SORT VO BY KIM
[ Tono 1200100094 Tanggal 400000 ]
[ Anissa 1200100046 Tanggal 500000 ]
[ Dafa 1200100048 Tanggal 200000 ]
[ Nurika 1200100049 Tanggal 400000 ]
[ Daliah 1200100074 Tanggal 300000 ]
[ Ayudha 1200100094 Tanggal 200000 ]
[ Dika 1200100097 Tanggal 350000 ]
[ Rukman 1200100101 Tanggal 400000 ]
[ Izzah 1200100107 Tanggal 120000 ]
[ Dina 1200100143 Tanggal 300000 ]
>>>

File Edit Format Run Options Window Help
def partisi(a, awal, akhir):
    hasil = 0
    pivot, pidx = median_3(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_3(a, awal, akhir):
    tengah = (awal+akhir)//2
    a = a[awal]
    b = a[tengah]
    c = a[akhir]
    if a <= b <= c:
        return b, tengah
    elif a <= c <= b:
        return b, tengah
    elif b <= a <= c:
        return a, awal
    elif b <= c <= a:
        return c, akhir-1
    elif c <= a <= b:
        return c, akhir-1
    elif c <= b <= a:
        return a, awal

def quicksort(a, awal, akhir):
    hasil = 0
    if awal < akhir:
        pidx, hasil = partisi(a, awal, akhir)
        hasil += quicksort(a, awal, pidx-1)
        hasil += quicksort(a, pidx+1, akhir)
    return hasil

def quicksort(a):
    quicksort(a, 0, len(a)-1)

def convert(a, b):
    hasil = []

```

## No 7

```

Python 3.8.2 Shell
File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:7b3b59, Feb 25 2020, 23:03:10) [AMD64] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: E:\kuliahan\semester 4\alhamdulillah\praktikum\praktikum algoritma\data\Modul_4
\U0177-02
merge: 0.000000 detik
quicksort: 0.000000 detik
merge v2: 0.190049 detik
quicksort v2: 0.000000 detik
>>>

File Edit Format Run Options Window Help
from time import time as detik
from random import shuffle as kocok
import time

def merge_sort(a):
    #print("Memulai", a)
    if len(a) > 1:
        mid = len(a) // 2
        separuhkiri = a[:mid]
        separuhkanan = a[mid:]
        merge_sort(separuhkiri)
        merge_sort(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]
            i = i + 1
            k = k + 1
        while j < len(separuhkanan):
            a[k] = separuhkanan[j]
            j = j + 1
            k = k + 1
        #print("Selesai", a)

def quick_sort(a, awal, akhir):
    if awal < akhir:
        pidx, hasil = partisi(a, awal, akhir)
        hasil += quicksort(a, awal, pidx-1)
        hasil += quicksort(a, pidx+1, akhir)
    return hasil

def quicksort(a):
    quicksort(a, 0, len(a)-1)

```

```
Python 3.6 Shell
File Edit Shell Debug Options Window Help
Python 3.6.2 (tags/v3.6.2:7b58f99, Feb 25 2020, 21:02:10) [AMD64] on win32
Type "help()", "copyright()", "credits()" or "license()" for more information.
>>>
>>> = RESTART: E:\kuliah\semester 4 silemshillillah\praktikum\prak algoritma\koda\koda_4
\koda_4.py
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