

Nama : Willi susanti

NIM : L200180060

## 6.1 Menggabungkan dua list yang sudahurut.

Latihan 6.1 Penggabung 2 list.py - E:/Praktikum AlgoPro/MODUL6/Latihan 6.1 Penggabung 2 list.py (3.8.2)

```
File Edit Format Run Options Window Help
#Latihan 6.1
def gabungDuaListUrut(A, B):
    la = len(A)
    lb = len(B)
    C = []
    i = 0
    j = 0

    while i < la and j < lb:
        if A[i] < B[j]:
            C.append(A[i])
            i += 1
        else:
            C.append(B[j])
            j += 1
    while i < la:
        C.append(A[i])
        i += 1
    while j < lb:
        C.append(B[j])
        j += 1
    return C

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 (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
==== RESTART: E:/Praktikum AlgoPro/MODUL6/Latihan 6.1 Penggabung 2 list.py ====
>>> data1= [ 1, 2, 3, 4, 5]
>>> data2= [ 6, 7, 8, 9, 10]
>>> W = gabungDuaListUrut(data1, data2)
>>> print(W)
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
>>> |
```

## 6.2 Merge sort

Latihan 6.2 marger sort.py - E:/Praktikum AlgoPro/MODUL6/Latihan 6.2 marger sort.py (3.8.2)

```
File Edit Format Run Options Window Help
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 += 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
    print("Menggabungkan", A) #

Python 3.8.2 Shell
File Edit Shell Debug Options Window Help
>>> mergeSort(alist)
Menggabungkan [1]
Menggabungkan [2]
Menggabungkan [1, 2]
Menggabungkan [3]
Menggabungkan [4]
Menggabungkan [5]
Menggabungkan [4, 5]
Menggabungkan [3, 4, 5]
Menggabungkan [1, 2, 3, 4, 5]
Menggabungkan [6]
Menggabungkan [7]
Menggabungkan [6, 7]
Menggabungkan [8]
Menggabungkan [9]
Menggabungkan [10]
Menggabungkan [9, 10]
Menggabungkan [8, 9, 10]
Menggabungkan [6, 7, 8, 9, 10]
Menggabungkan [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
>>> print (alist)
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
>>> alist = [ 60, 12, 20, 16,18,22,23]
>>> mergeSort(alist)
Menggabungkan [60]
Menggabungkan [12]
Menggabungkan [20]
Menggabungkan [12, 20]
Menggabungkan [12, 20, 60]
Menggabungkan [16]
Menggabungkan [18]
Menggabungkan [16, 18]
Menggabungkan [22]
Menggabungkan [23]
Menggabungkan [22, 23]
Menggabungkan [16, 18, 22, 23]
Menggabungkan [12, 16, 18, 20, 22, 23, 60]
>>> print (alist)
[12, 16, 18, 20, 22, 23, 60]
>>> |

praktikum-ASD/LATIHAN.py at master · L2001800417/ · GitHub
Ln: 52 Col: 4
```

### 6.3 Quick sort

Latihan 6.3 Quick Sort.py - E:\Praktikum AlgoPro\MODUL6\Latihan 6.3 Quick Sort.py (3.8.2)

File Edit Format Run Options Window Help

```
alist = [ 54, 26, 93, 17, 77, 31, 44, 55, 20 ]
```

```
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]
    penandaKiri = awal + 1
    penandaKanan = akhir
    selesai = False
    while not selesai:
        while penandaKiri <= penandaKanan and A[penandaKiri] <= nilaiPivot:
            penandaKiri = penandaKiri + 1
        while A[penandaKanan] >= 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[penandaKiri]
    A[penandaKanan] = temp
    return penandaKanan
quickSort(alist)
print(alist)
```

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 (Intel)] on win32

Type "help", "copyright", "credits" or "license()" for more information.

>>>

```
===== RESTART: E:\Praktikum AlgoPro\MODUL6\Latihan 6.3 Quick Sort.py =====
[77, 54, 77, 54, 77, 54, 93, 77, 93]
```

## Soal – soal Mahasiswa

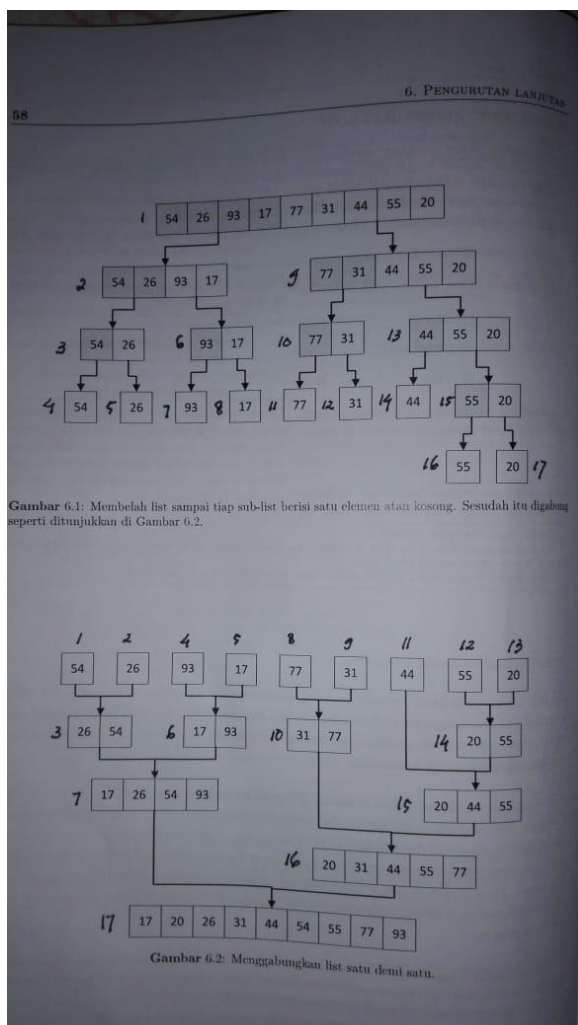
1

no1.py - E:\Praktikum AlgoPro\MODUL6\nol.py (3.8.2)  
File Edit Format Run Options Window Help

```
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]  
    penandaKiri = awal + 1  
    penandaKanan = akhir  
    selesai = False  
    while not selesai:  
        while penandaKiri <= penandaKanan and A[penandaKiri] <= nilaiPivot:  
            penandaKiri = penandaKiri + 1  
        while A[penandaKanan] >= 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[penandaKiri]  
    A[penandaKanan] = temp  
    return penandaKanan  
  
mh1 = Mahasiswa("Saipul", 18, "Purwodadi", 10000)  
mh2 = Mahasiswa("Risma", 13, "Klaten", 13000)  
mh3 = Mahasiswa("Willi Imut", 29, "Sragen", 5000)  
mh4 = Mahasiswa("Chaterinaa", 47, "Pekalongan", 12000)  
mh5 = Mahasiswa("Suwarjo", 144, "Bandung", 2000)  
  
A = [mh1.nim, mh2.nim, mh3.nim, mh4.nim, mh5.nim]  
mergeSort(A)  
print(A)
```

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 (Intel)] on win32  
Type "help", "copyright", "credits" or "license()" for more information.  
>>>  
===== RESTART: E:\Praktikum AlgoPro\MODUL6\nol.py =====  
[13, 18, 29, 47, 144]  
>>>

2.



3.

no3.py - E:\Praktikum AlgoPro\MODUL6\no3.py (3.8.2)

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

k = [i for i in range(1, 6000)]
kocok(k)

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

def cariposisiterkecil(A, darisini, sampaisini):
    posisiterkecil = darisini
    for i in range(darisini + 1, sampaisini):
        if A[i] < A[posisiterkecil]:
            posisiterkecil = i
    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 = cariposisiterkecil(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
```

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 (Intel)] on win32  
Type "help", "copyright", "credits" or "license()" for more information.  
>>>  
===== RESTART: E:\Praktikum AlgoPro\MODUL6\nol.py =====  
>>>  
[13, 18, 29, 47, 144]  
>>>  
===== RESTART: E:\Praktikum AlgoPro\MODUL6\nol.py =====  
bubble : 15.0662 detik  
selection : 5.66504 detik  
insertion : 10.2899 detik  
merge : 0.114043 detik  
quick : 0.0531993 detik  
>>>

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

Proses 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	

									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			

5.

no5.py - E:\Praktikum AlgoPro\MODUL6\no5.py (3.8.2)
File Edit Format Run Options Window Help

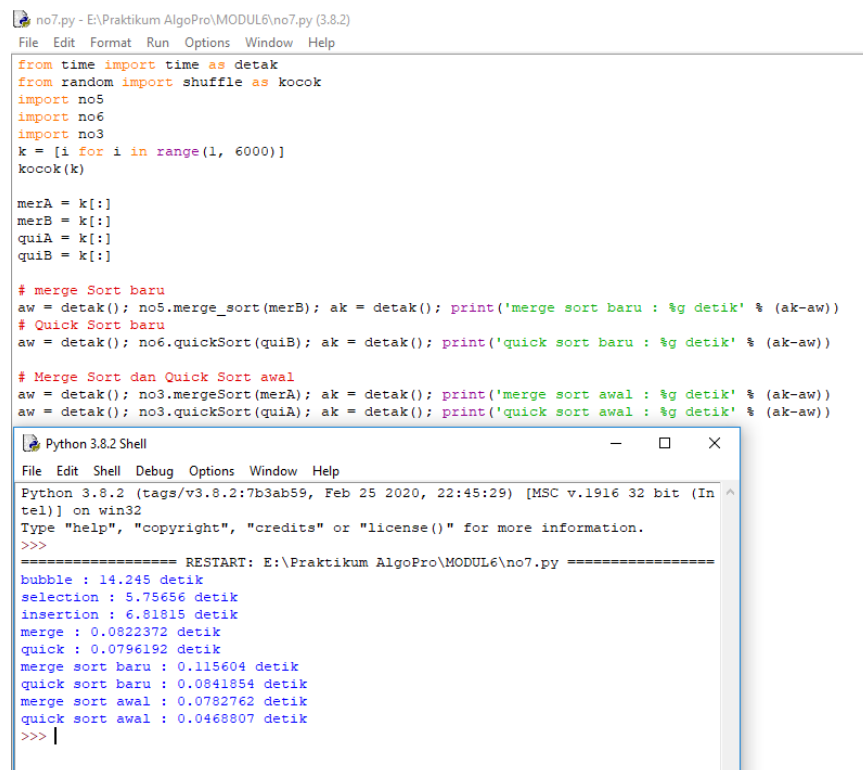
Python 3.8.2 Shell
File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 22:45:29) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: E:\Praktikum AlgoPro\MODUL6\no1.py =====
[13, 18, 29, 47, 144]
>>>
===== RESTART: E:\Praktikum AlgoPro\MODUL6\no3.py =====
bubble : 15.0662 detik
selection : 5.66504 detik
insertion : 10.2899 detik
merge : 0.114043 detik
quick : 0.0531993 detik
>>>
===== RESTART: E:\Praktikum AlgoPro\MODUL6\no5.py =====
>>> print(marge\_sort([11,15,20,3,25]))
Traceback (most recent call last):
 File "<pyshell#0>", line 1, in <module>
 print(marge\_sort([11,15,20,3,25]))
NameError: name 'marge\_sort' is not defined
>>> print(marge\_sort([11,15,20,3,25]))
[3, 11, 15, 20, 25]
>>>

6.

no6.py - E:\Praktikum AlgoPro\MODUL6\no6.py (3.8.2)
File Edit Format Run Options Window Help

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 (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: E:\Praktikum AlgoPro\MODUL6\no1.py =====
[13, 18, 29, 47, 144]
>>>
===== RESTART: E:\Praktikum AlgoPro\MODUL6\no3.py =====
bubble : 15.0662 detik
selection : 5.66504 detik
insertion : 10.2899 detik
merge : 0.114043 detik
quick : 0.0531993 detik
>>>
===== RESTART: E:\Praktikum AlgoPro\MODUL6\no5.py =====
>>> print(marge\_sort([11,15,20,3,25]))
Traceback (most recent call last):
 File "<pyshell#0>", line 1, in <module>
 print(marge\_sort([11,15,20,3,25]))
NameError: name 'marge\_sort' is not defined
>>> print(marge\_sort([11,15,20,3,25]))
[3, 11, 15, 20, 25]
>>>
===== RESTART: E:\Praktikum AlgoPro\MODUL6\no6.py =====
>>> quickSort(daftar)
>>> print(daftar)
[4, 10, 12, 14, 26, 123, 124]
>>> quickSort(daftar)
>>> print(daftar)
[4, 10, 12, 14, 26, 123, 124]
>>>
===== RESTART: E:\Praktikum AlgoPro\MODUL6\no6.py =====
>>> quickSort(daftar)
>>> print(daftar)
[18, 22, 36, 45, 110, 113, 134]
>>>

7.



```

no7.py - E:\Praktikum AlgoPro\MODUL6\no7.py (3.8.2)
File Edit Format Run Options Window Help

from time import time as detik
from random import shuffle as kocok
import no5
import no6
import no3
k = [i for i in range(1, 6000)]
kocok(k)

merA = k[:]
merB = k[:]
quiA = k[:]
quiB = k[:]

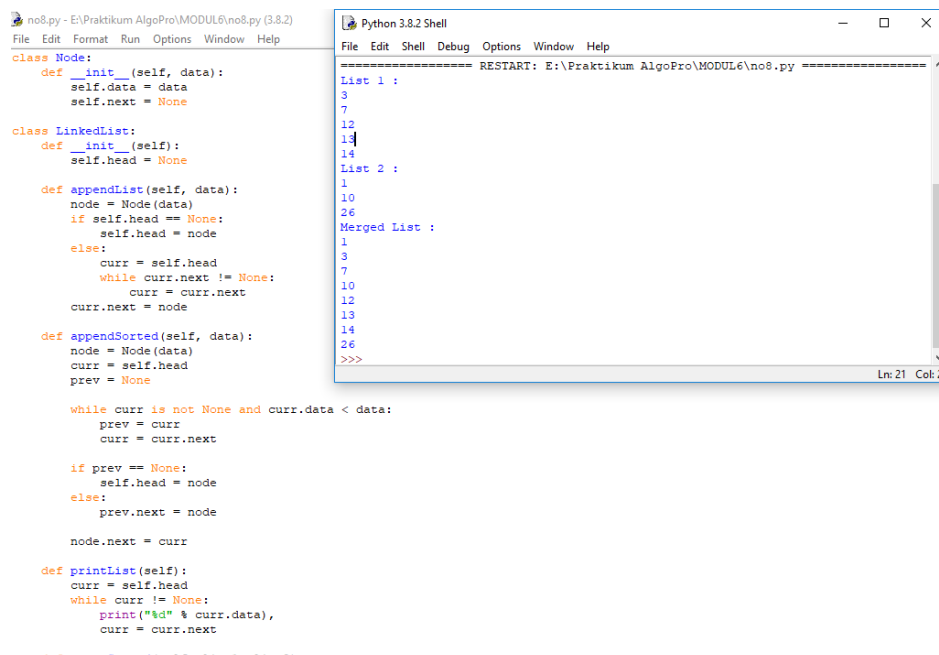
# merge Sort baru
aw = detik(); no5.merge_sort(merB); ak = detik(); print('merge sort baru : %g detik' % (ak-aw))
# Quick Sort baru
aw = detik(); no6.quickSort(quiB); ak = detik(); print('quick sort baru : %g detik' % (ak-aw))

# Merge Sort dan Quick Sort awal
aw = detik(); no3.mergeSort(merA); ak = detik(); print('merge sort awal : %g detik' % (ak-aw))
aw = detik(); no3.quickSort(quiA); ak = detik(); print('quick sort awal : %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 (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: E:\Praktikum AlgoPro\MODUL6\no7.py =====
bubble : 14.245 detik
selection : 5.75656 detik
insertion : 6.81815 detik
merge : 0.0822372 detik
quick : 0.0796192 detik
merge sort baru : 0.115604 detik
quick sort baru : 0.0841854 detik
merge sort awal : 0.0782762 detik
quick sort awal : 0.0468807 detik
>>>

```

8.



```

no8.py - E:\Praktikum AlgoPro\MODUL6\no8.py (3.8.2)
File Edit Format Run Options Window Help

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

class LinkedList:
    def __init__(self):
        self.head = None

    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

    def printList(self):
        curr = self.head
        while curr != None:
            print("%d" % curr.data),
            curr = curr.next

def mergeSortedList(l1, l2):
    l = LinkedList()
    l1.printList()
    l2.printList()
    l.appendList(l1.head.data)
    l.appendList(l2.head.data)
    l.printList()

Python 3.8.2 Shell
File Edit Shell Debug Options Window Help
===== RESTART: E:\Praktikum AlgoPro\MODUL6\no8.py =====
List 1 :
3
7
12
13
14
List 2 :
1
10
26
Merged List :
1
3
7
10
12
13
14
26
>>>
Ln 21 Col 2

```