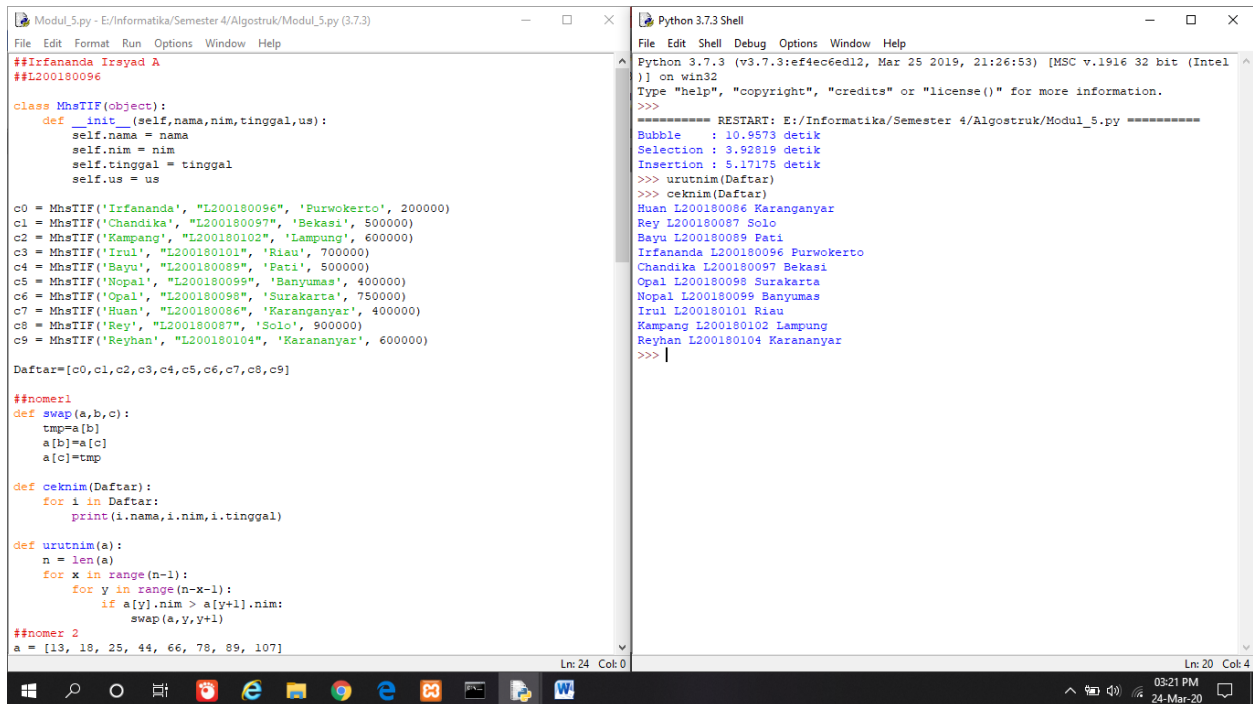


Nama : Irfananda Irsyad A
NIM : L200180096
Kelas : D

Tugas Modul 5

Mengurutkan Array Mahasiswa berdasarkan NIM



```
Modul_5.py - E:/Informatika/Semester 4/Algostruk/Modul_5.py (3.7.3)
File Edit Format Run Options Window Help

##Irfananda Irsyad A
##L200180096

class MhsTIF(object):
    def __init__(self,nama,nim,tinggal,us):
        self.nama = nama
        self.nim = nim
        self.tinggal = tinggal
        self.us = us

c0 = MhsTIF('Irfananda', 'L200180096', 'Purwokerto', 200000)
c1 = MhsTIF('Chandika', 'L200180097', 'Bekasi', 500000)
c2 = MhsTIF('Kampang', 'L200180102', 'Lampung', 600000)
c3 = MhsTIF('Irul', 'L200180101', 'Riau', 700000)
c4 = MhsTIF('Bayu', 'L200180089', 'Pati', 500000)
c5 = MhsTIF('Nopal', 'L200180099', 'Banyumas', 400000)
c6 = MhsTIF('Opal', 'L200180098', 'Surakarta', 750000)
c7 = MhsTIF('Huan', 'L200180086', 'Karanganyar', 400000)
c8 = MhsTIF('Rey', 'L200180087', 'Solo', 900000)
c9 = MhsTIF('Reyhan', 'L200180104', 'Karananyar', 600000)

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

##nomer1
def swap(a,b,c):
    tmp=a[b]
    a[b]=a[c]
    a[c]=tmp

def ceknim(Daftar):
    for i in Daftar:
        print(i.nama,i.nim,i.tinggal)

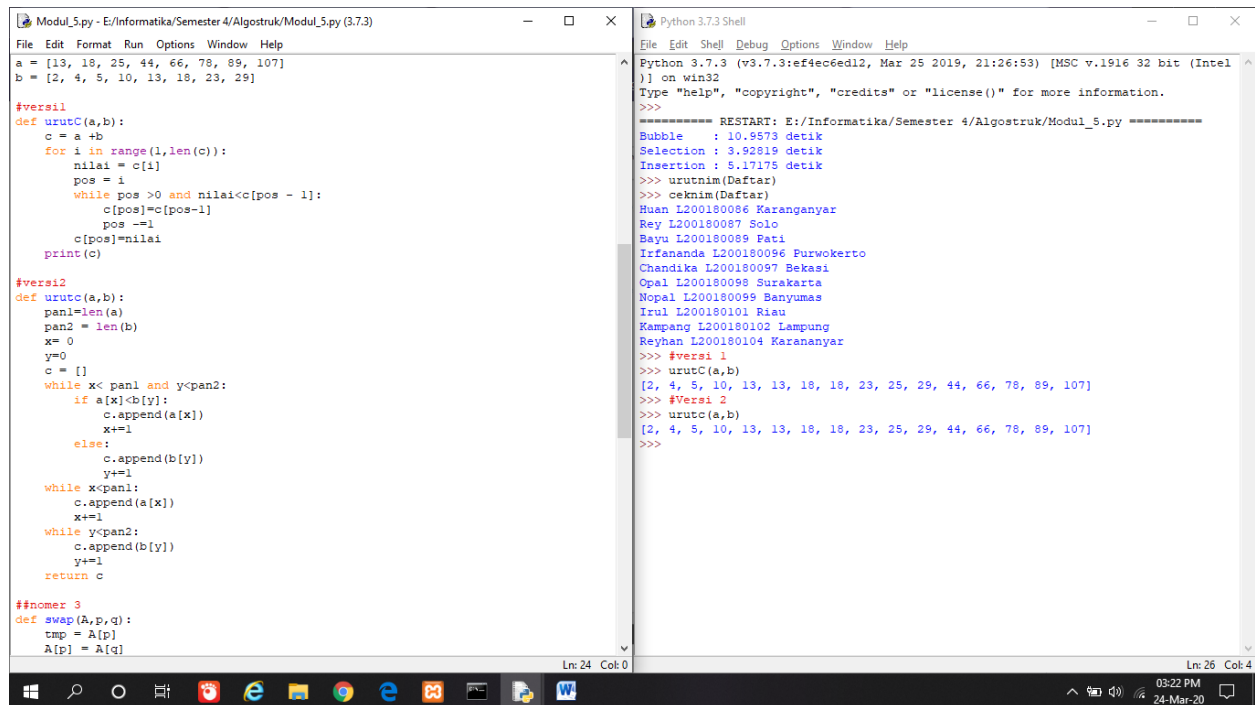
def urutnim(a):
    n = len(a)
    for x in range(n-1):
        for y in range(n-x-1):
            if a[y].nim > a[y+1].nim:
                swap(a,y,y+1)

##nomer 2
a = [13, 18, 25, 44, 66, 78, 89, 107]
```

```
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_5.py =====
Bubble : 10.9573 detik
Selection : 3.92019 detik
Insertion : 5.17175 detik
>>> urutnim(Daftar)
>>> ceknim(Daftar)
Huan L200180086 Karanganyar
Rey L200180087 Solo
Bayu L200180089 Pati
Irfananda L200180096 Purwokerto
Chandika L200180097 Bekasi
Opal L200180098 Surakarta
Nopal L200180099 Banyumas
Irul L200180101 Riau
Kampang L200180102 Lampung
Reyhan L200180104 Karananyar
>>>
```

Menggabungkan kedua array menjadi 1 array



```
Modul_5.py - E:/Informatika/Semester 4/Algostruk/Modul_5.py (3.7.3)
File Edit Format Run Options Window Help
a = [13, 18, 25, 44, 66, 78, 89, 107]
b = [2, 4, 5, 10, 13, 18, 23, 29]

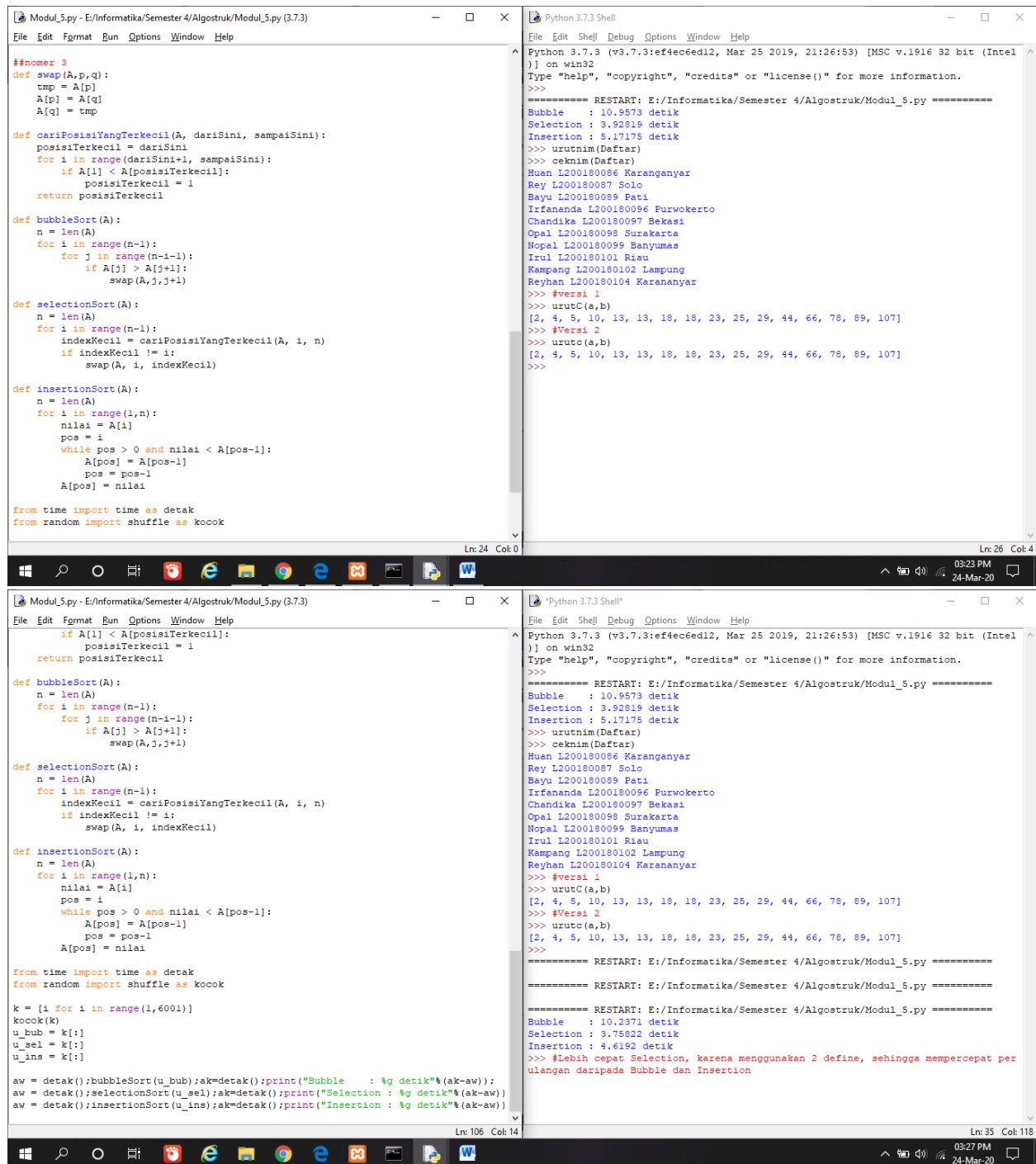
#versi1
def urutC(a,b):
    c = a + b
    for i in range(1, len(c)):
        nilai = c[i]
        pos = i
        while pos > 0 and nilai < c[pos - 1]:
            c[pos] = c[pos-1]
            pos -= 1
            c[pos] = nilai
        print(c)

#versi2
def urutC(a,b):
    pan1 = len(a)
    pan2 = len(b)
    x = 0
    y = 0
    c = []
    while x < pan1 and y < pan2:
        if a[x] < b[y]:
            c.append(a[x])
            x += 1
        else:
            c.append(b[y])
            y += 1
    while x < pan1:
        c.append(a[x])
        x += 1
    while y < pan2:
        c.append(b[y])
        y += 1
    return c

##nomer 3
def swap(a,p,q):
    tmp = a[p]
    a[p] = a[q]
    a[q] = tmp

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_5.py =====
Bubble : 10.9573 detik
Selection : 3.92019 detik
Insertion : 5.17175 detik
>>> urutnim(Daftar)
>>> ceknim(Daftar)
Huan L200180086 Karanganyar
Rey L200180087 Solo
Bayu L200180089 Pati
Irfananda L200180096 Purwokerto
Chandika L200180097 Bekasi
Opal L200180098 Surakarta
Nopal L200180099 Banyumas
Irul L200180101 Riau
Kampang L200180102 Lampung
Reyhan L200180104 Karananyar
>>> #versi 1
>>> urutC(a,b)
[2, 4, 5, 10, 13, 13, 18, 18, 23, 25, 29, 44, 66, 78, 89, 107]
>>> #Versi 2
>>> urutC(a,b)
[2, 4, 5, 10, 13, 13, 18, 18, 23, 25, 29, 44, 66, 78, 89, 107]
>>>
```

Membandingkan waktu antara Bubble, Selection, dan Insertion Short



```
Modul_5.py - E:/Informatika/Semester 4/Algostruk/Modul_5.py (3.7.3)
File Edit Format Run Options Window Help

##nomer 3
def swap(A,p,q):
    tmp = A[p]
    A[p] = A[q]
    A[q] = tmp

def cariPosisiYangTerkecil(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 = cariPosisiYangTerkecil(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

from time import time as detik
from random import shuffle as kocok

Ln: 24 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_5.py =====
Bubble : 10.9573 detik
Selection : 3.92819 detik
Insertion : 5.17175 detik
>>> urutnim(Daftar)
>>> ceknim(Daftar)
Huan L200180086 Karanganyar
Rey L200180087 Solo
Bayu L200180089 Pati
Irfananda L200180096 Purwokerto
Chandika L200180097 Bekasi
Opal L200180098 Surakarta
Nopal L200180099 Banyumas
Irul L200180101 Riau
Kampang L200180102 Lampung
Reyhan L200180104 Karananyar
>>> #versi 1
>>> urutC(a,b)
[2, 4, 5, 10, 13, 13, 18, 18, 23, 25, 29, 44, 66, 78, 89, 107]
>>> #Versi 2
>>> urutC(a,b)
[2, 4, 5, 10, 13, 13, 18, 18, 23, 25, 29, 44, 66, 78, 89, 107]
>>>

Ln: 26 Col: 4

Modul_5.py - E:/Informatika/Semester 4/Algostruk/Modul_5.py (3.7.3)
File Edit Format Run Options Window Help

    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 = cariPosisiYangTerkecil(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

from time import time as detik
from random import shuffle as kocok

k = [i for i in range(1,6001)]
kocok(k)
u_bub = k[:]
u_sel = k[:]
u_ins = k[:]

aw = detik();bubbleSort(u_bub);ak=detak();print("Bubble : %g detik"%(ak-aw));
aw = detik();selectionSort(u_sel);ak=detak();print("Selection : %g detik"%(ak-aw));
aw = detik();insertionSort(u_ins);ak=detak();print("Insertion : %g detik"%(ak-aw))

Ln: 106 Col: 14

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_5.py =====
Bubble : 10.9573 detik
Selection : 3.92819 detik
Insertion : 5.17175 detik
>>> urutnim(Daftar)
>>> ceknim(Daftar)
Huan L200180086 Karanganyar
Rey L200180087 Solo
Bayu L200180089 Pati
Irfananda L200180096 Purwokerto
Chandika L200180097 Bekasi
Opal L200180098 Surakarta
Nopal L200180099 Banyumas
Irul L200180101 Riau
Kampang L200180102 Lampung
Reyhan L200180104 Karananyar
>>> #versi 1
>>> urutC(a,b)
[2, 4, 5, 10, 13, 13, 18, 18, 23, 25, 29, 44, 66, 78, 89, 107]
>>> #Versi 2
>>> urutC(a,b)
[2, 4, 5, 10, 13, 13, 18, 18, 23, 25, 29, 44, 66, 78, 89, 107]
>>>

===== RESTART: E:/Informatika/Semester 4/Algostruk/Modul_5.py =====
===== RESTART: E:/Informatika/Semester 4/Algostruk/Modul_5.py =====
Bubble : 10.2371 detik
Selection : 3.75822 detik
Insertion : 4.6192 detik
>>> #Lebih cepat Selection, karena menggunakan 2 define, sehingga mempercepat per
ulangan daripada Bubble dan Insertion

Ln: 35 Col: 118
```