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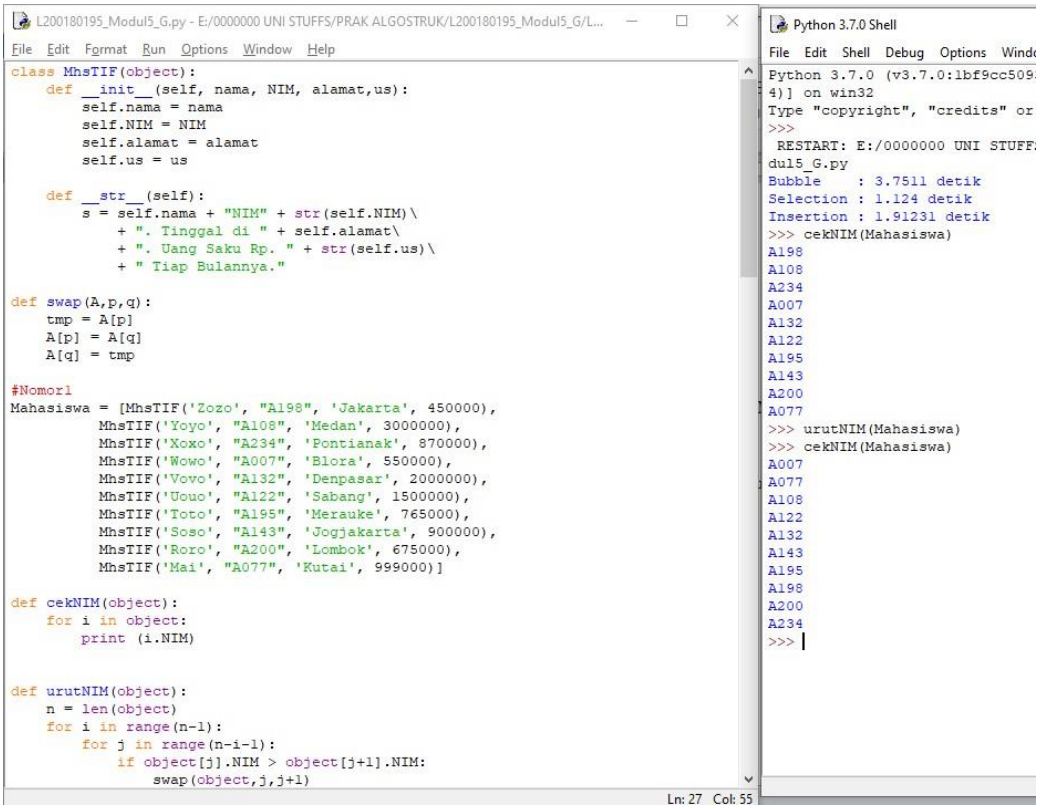
MODUL 5

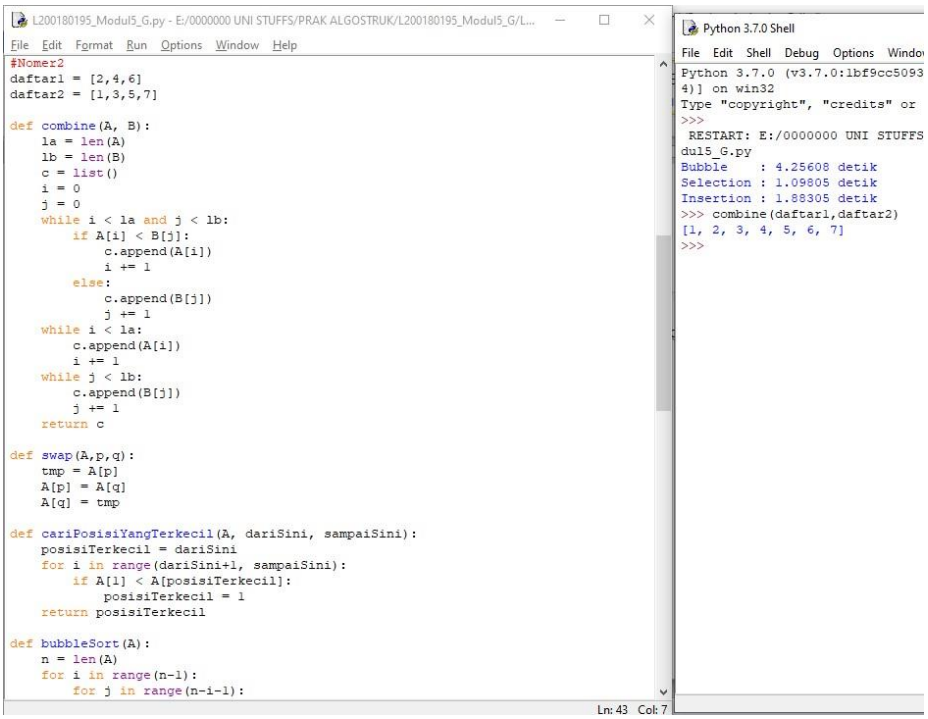
1. Program untuk mengurutkan array mahasiswa berdasarkan NIM



```
L200180195_Modul5_G.py - E:/0000000 UNI STUFFS/PRAK ALGOSTRUK/L200180195_Modul5_G/L...
File  Edit  Format  Run  Options  Window  Help
class MhsTIF(object):
    def __init__(self, nama, NIM, alamat,us):
        self.nama = nama
        self.NIM = NIM
        self.alamat = alamat
        self.us = us

    def __str__(self):
        s = self.nama + "NIM" + str(self.NIM)\
            + ". Tinggal di " + self.alamat\
            + ". Uang Saku Rp. " + str(self.us)\
            + " Tiap Bulannya."

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

#Nomor1
Mahasiswa = [MhsTIF('Zozo', "A198", 'Jakarta', 450000),
          MhsTIF('Yoyo', "A108", 'Medan', 3000000),
          MhsTIF('Xoxo', "A234", 'Pontianak', 870000),
          MhsTIF('Wowo', "A007", 'Blora', 550000),
          MhsTIF('Vovo', "A132", 'Denpasar', 2000000),
          MhsTIF('Uouo', "A122", 'Sabang', 1500000),
          MhsTIF('Toto', "A195", 'Merauke', 765000),
          MhsTIF('Soso', "A143", 'Jogjakarta', 900000),
          MhsTIF('Roro', "A200", 'Lombok', 675000),
          MhsTIF('Mai', "A077", 'Kutai', 999000)]

def cekNIM(object):
    for i in object:
        print (i.NIM)


def urutNIM(object):
    n = len(object)
    for i in range(n-1):
        for j in range(n-i-1):
            if object[j].NIM > object[j+1].NIM:
                swap(object,j,j+1)
Ln: 27  Col: 55
```

```
Python 3.7.0 Shell
File  Edit  Shell  Debug  Options  Windo
Python 3.7.0 (v3.7.0:1bf9cc509
4)] on win32
Type "copyright", "credits" or
>>>
 RESTART: E:/0000000 UNI STUFF
dul5_G.py
Bubble    : 3.7511 detik
Selection : 1.124 detik
Insertion : 1.91231 detik
>>> cekNIM(Mahasiswa)
A198
A108
A234
A007
A132
A122
A195
A143
A200
A077
>>> urutNIM(Mahasiswa)
>>> cekNIM(Mahasiswa)
A007
A077
A108
A122
A132
A143
A195
A198
A200
A234
>>>
```

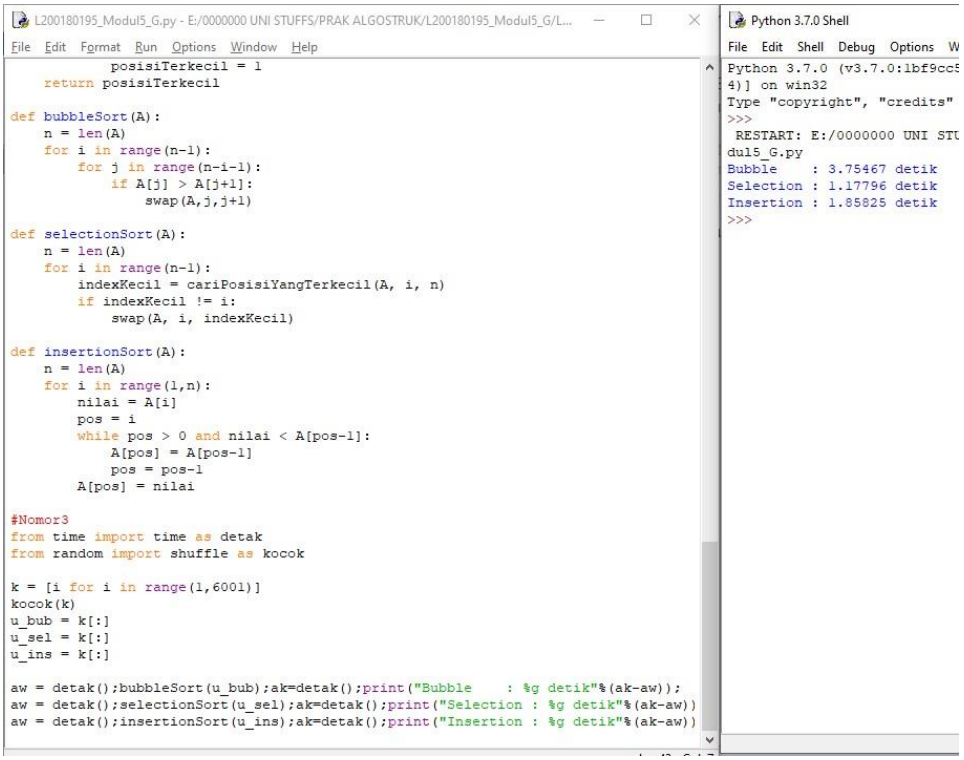
2. Program untuk menggabungkan array A dan B yang sudah urut menjadi array C



```
#Nomer2
daftar1 = [2,4,6]
daftar2 = [1,3,5,7]

def combine(A, B):
    la = len(A)
    lb = len(B)
    c = list()
    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

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):
```

```
Python 3.7.0 (v3.7.0:1bf9cc5093
4)] on win32
Type "copyright", "credits" or
>>>
 RESTART: E:/0000000 UNI STUFFS
dul5_G.py
Bubble    : 4.25608 detik
Selection : 1.09805 detik
Insertion : 1.88305 detik
>>> combine(daftar1,daftar2)
[1, 2, 3, 4, 5, 6, 7]
>>>
```

3. Menyelidiki kecepatan dari bubble sort, selection sort, dan insertion sort



```
            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

#Nomor3
from time import time as detak
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 = 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))
```

```
Python 3.7.0 (v3.7.0:1bf9cc5
4)] on win32
Type "copyright", "credits"
>>>
 RESTART: E:/0000000 UNI STU
dul5_G.py
Bubble    : 3.75467 detik
Selection : 1.17796 detik
Insertion : 1.85825 detik
>>>
```