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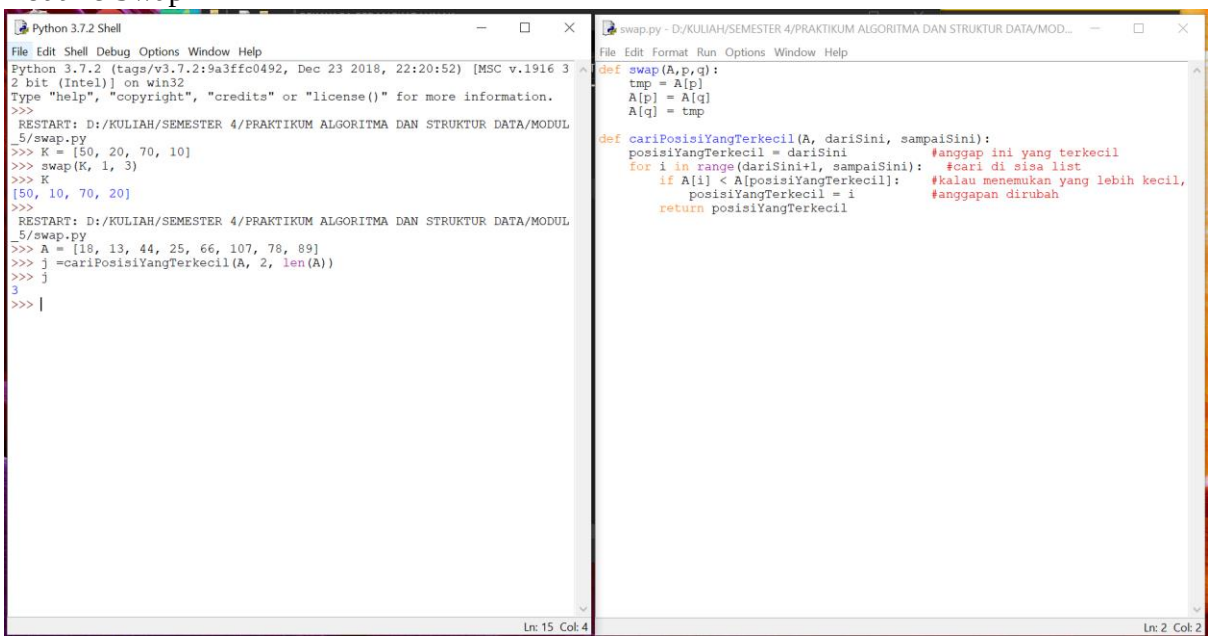
NIM : L200180012
Kelas : A

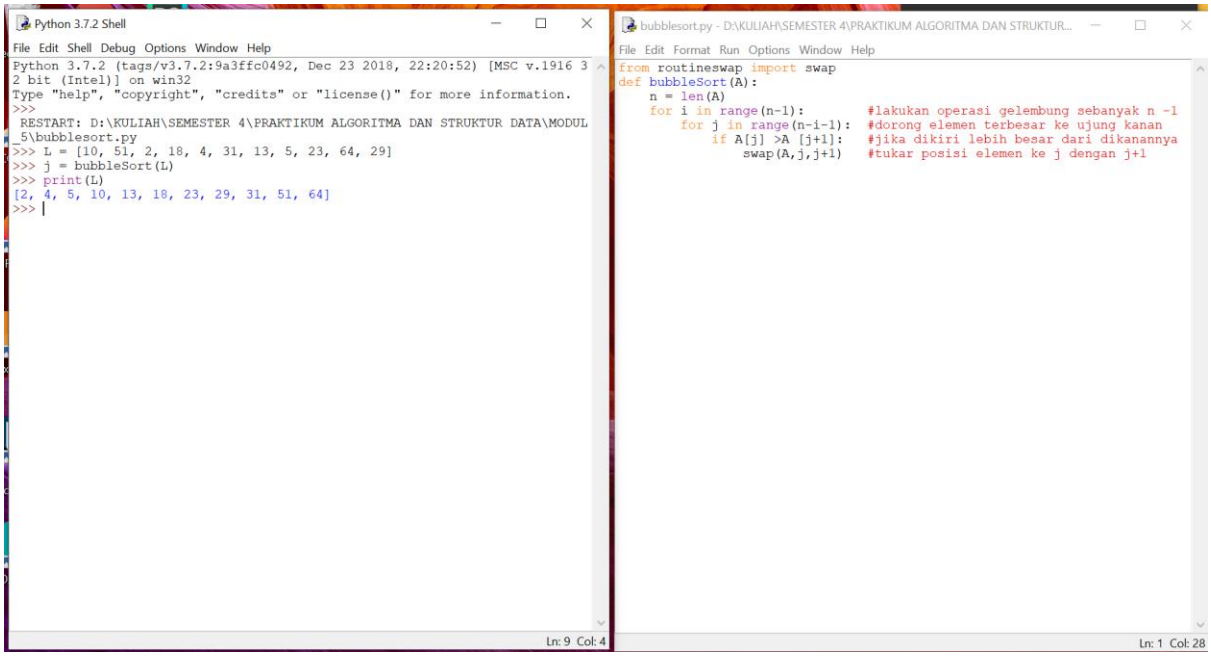
MODUL 5. PENGURUTAN

LATIHAN

Routine Swap



Bubble Sort



Selection Sort

```
 RESTART: D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\MODUL
_5\selectionsort.py
>>> B = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
>>> l = selectionSort(B)
>>> print(B)
[10, 2, 18, 4, 31, 13, 5, 23, 51, 29, 64]
>>>
```

selectionsort.py - D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\...

File Edit Format Run Options Window Help

```
from routineswap import swap, cariPosisiYangTerkecil
def selectionSort(A):
    n = len(A)
    for i in range(n-1):
        indexKecil = cariPosisiYangTerkecil(A,i,n)
        if indexKecil != i:
            swap(A,i,indexKecil)
```

Insertion Sort

insertionsort.py - D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\M...

File Edit Format Run Options Window Help

```
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]:    #cari posisi yang tepat
            A[pos] = A[pos - 1]                  #dan geser kekanan terus
            pos = pos - 1                        #nilai-nilai yang lebih besar
        A[pos] = nilai      #pada posisi ini tempatkan nilai elemen ke i
```

Python 3.7.2 Shell

File Edit Shell Debug Options Window Help

```
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 22:20:52) [MSC v.1916 32 bit
(Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
 RESTART: D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\MODUL_5\ins
ertionsort.py
>>> C = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
>>> m = insertionSort(C)
>>> print(C)
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
>>>
```

Ln: 9 Col: 4

TUGAS

Nomor 1.

1.py - D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\MODUL_5\1.py (3.7....

File Edit Format Run Options Window Help

```
class Mahasiswa(object):
    def __init__(self, nama, NIM, kota, us):
        self.nama = nama
        self.NIM = NIM
        self.kotaTinggal = kota
        self.uangSaku = us

def bubbleSort(N):
    for x in range(len(N)-1,0,-1):
        for i in range(x):
            if N[i]>N[i+1]:
                tmp = N[i]
                N[i] = N[i+1]
                N[i+1] = tmp

c0 = Mahasiswa('Caca',7,'Semarang',240000)
c1 = Mahasiswa('Fitria',12,'Sragen',230000)
c2 = Mahasiswa('Hana',2,'Bandung',250000)
c3 = Mahasiswa('Dila',21,'Yogyakarta',235000)
c4 = Mahasiswa('Dodo',17,'Magelang',240000)
c5 = Mahasiswa('Rara',4,'Klaten',250000)
c6 = Mahasiswa('Mela',36,'Surakarta',245000)
c7 = Mahasiswa('Okta',40,'Pacitan',245000)
c8 = Mahasiswa('Lani',27,'Klaten',245000)
c9 = Mahasiswa('Nasha',19,'Boyolali',270000)
c10 = Mahasiswa('Rafi',8,'Surakarta',230000)

a = [c0.NIM,c1.NIM,c2.NIM,c3.NIM,c4.NIM,c5.NIM,c6.NIM,c7.NIM,c8.NIM,c9.NIM,c10.NIM]
bubbleSort(a)
print(a)
```

Python 3.7.2 Shell

File Edit Shell Debug Options Window Help

```
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 22:20:52) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
 RESTART: D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\MODUL_5\1.py
[2, 4, 7, 8, 12, 17, 19, 21, 27, 36, 40]
>>>
```

Nomor 2.

2.py - D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\MODUL_5\2....

File Edit Format Run Options Window Help

```
def bubbleSort(N):
    for x in range(len(N)-1,0,-1):
        for i in range(x):
            if N[i]>N[i+1]:
                tmp = N[i]
                N[i] = N[i+1]
                N[i+1] = tmp

a = [21,45,67,89,12,17,4,25]
bubbleSort(a)
b = a
a1 = [21,45,67,89,12,17,4,25]
bubbleSort(a1)
c = a1
a2 = (b+c)
bubbleSort(a2)
d = a2
print(d)
```

Python 3.7.2 Shell

File Edit Shell Debug Options Window Help

```
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 22:20:52) [MSC v.1916 32 bit
(Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
 RESTART: D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\MODUL_5\2.p
y
[4, 4, 12, 12, 17, 17, 21, 21, 25, 25, 45, 45, 67, 67, 89, 89]
>>>
```

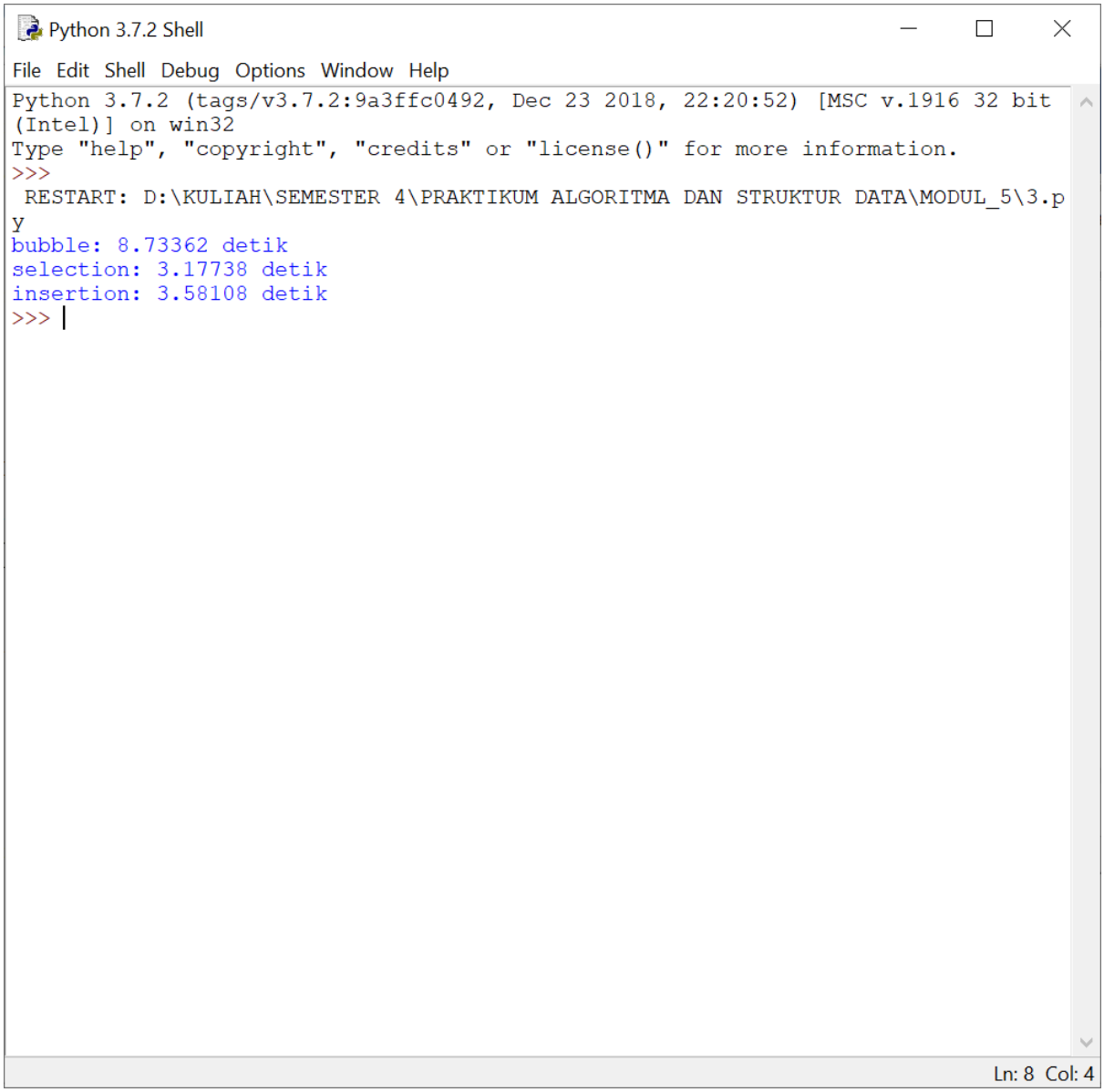
Nomor 3.

3.py - D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\MODUL_5\3.py (3.7.2)

File Edit Format Run Options Window Help

```
from time import time as detak
from random import shuffle as kocok

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

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

def cariPosisiYangTerkecil(A,dariSini, sampaiSini):
    posisiYangTerkecil = dariSini
    for i in range (dariSini+1, sampaiSini):
        if A[i] < A[posisiYangTerkecil]:
            posisiYangTerkecil = i
    return posisiYangTerkecil

k = []
for i in range(1,6001):
    k.append(i)
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));
```

Ln: 37 Col: 34


Python 3.7.2 Shell
File Edit Shell Debug Options Window Help
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 22:20:52) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
RESTART: D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\MODUL_5\3.py
bubble: 8.73362 detik
selection: 3.17738 detik
insertion: 3.58108 detik
>>>
Ln: 8 Col: 4