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Kelas : F

Praktikum

```
Python 3.8.2 Shell
File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 23:03:10) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\praktikum_5.py
>>> K = [50, 20, 70, 10]
>>> swap(K, 1, 3)
>>> K
[50, 10, 70, 20]
>>> |

praktikum_5.py - D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\praktikum_5.py
File Edit Format Run Options Window Help
def swap(A, p, q):
    tmp = A[p]
    A[p] = A[q]
    A[q] = tmp

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

#L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
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)
    bubbleSort(L)

#L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
def selectionSort(A):
    n = len(A)
    for i in range(n-1):
        indexKecil = cariPosisiTerkecil(A, i, n)
        if indexKecil != i:
            swap(A, i, indexKecil)
    selectionSort(L)

#L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
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
```

```
Python 3.8.2 Shell
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>>>
= RESTART: D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\praktikum_5.py
>>>
= RESTART: D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\praktikum_5.py
>>> j
3
>>> |

praktikum_5.py - D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\praktikum_5.py
File Edit Format Run Options Window Help
def swap(A, p, q):
    tmp = A[p]
    A[p] = A[q]
    A[q] = tmp

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

A = [18, 13, 44, 25, 66, 107, 78, 89]
j = cariPosisiTerkecil(A, 2, len(A))

#L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
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)
    bubbleSort(L)

#L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
def selectionSort(A):
    n = len(A)
    for i in range(n-1):
        indexKecil = cariPosisiTerkecil(A, i, n)
        if indexKecil != i:
            swap(A, i, indexKecil)
    selectionSort(L)

#L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
def insertionSort(A):
    n = len(A)
    for i in range(1, n):
        nilai = A[i]
        pos = i
```

BubbleSort

```
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>>>
= RESTART: D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\praktikum_5.py
>>> L
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
>>>

praktikum_5.py - D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\...
File Edit Format Run Options Window Help
def swap(A, p, q):
    tmp = A[p]
    A[p] = A[q]
    A[q] = tmp

def cariPosisiTerkecil(A, dariSini, sampaiSini):
    ## posisiTerkecil = dariSini
    ## for i in range(dariSini+1, sampaiSini):
    ##     if A[i] < A[posisiTerkecil]:
    ##         posisiTerkecil = i
    ## return posisiTerkecil
    ## A = [18, 13, 44, 25, 66, 107, 78, 89]
    ##
    ## j = cariPosisiTerkecil(A, 2, len(A))

L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
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)
bubbleSort(L)

##L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
def selectionSort(A):
    n = len(A)
    ## for i in range(n-1):
    ##     indexKecil = cariPosisiTerkecil(A, i, n)
    ##     if indexKecil != i:
    ##         swap(A, i, indexKecil)
    ## selectionSort(L)

##L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
def insertionSort(A):
    n = len(A)
    ## for i in range(1, n):
    ##     nilai = A[i]
    ##     pos = i
```

SelectionSort

```
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>>>
= RESTART: D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\praktikum_5.py
>>> L
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
>>> |

praktikum_5.py - D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\...
File Edit Format Run Options Window Help
def swap(A, p, q):
    tmp = A[p]
    A[p] = A[q]
    A[q] = tmp

def cariPosisiTerkecil(A, dariSini, sampaiSini):
    posisiTerkecil = dariSini
    for i in range(dariSini+1, sampaiSini):
        if A[i] < A[posisiTerkecil]:
            posisiTerkecil = i
    return posisiTerkecil
A = [18, 13, 44, 25, 66, 107, 78, 89]
j = cariPosisiTerkecil(A, 2, len(A))

##L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
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)
    ## bubbleSort(L)
    ##

L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
def selectionSort(A):
    n = len(A)
    for i in range(n-1):
        indexKecil = cariPosisiTerkecil(A, i, n)
        if indexKecil != i:
            swap(A, i, indexKecil)
    selectionSort(L)

##L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
def insertionSort(A):
    n = len(A)
    ## for i in range(1, n):
    ##     nilai = A[i]
    ##     pos = i
```

InsertionSort

```
Python 3.8.2 Shell
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>>>
= RESTART: D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\praktikum_5.py
>>> L
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
>>> |

praktikum_5.py - D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5...
File Edit Format Run Options Window Help
## posisiTerkecil = dariSini
## for i in range(dariSini+1, sampaiSini):
##     if A[i] < A[posisiTerkecil]:
##         posisiTerkecil = i
##     return posisiTerkecil
## A = [18, 13, 44, 25, 66, 107, 78, 89]
##
## cariPosisiTerkecil(A, 2, len(A))

## L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
## 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)
##     bubbleSort(L)
##

## L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
## def selectionSort(A):
##     n = len(A)
##     for i in range(n-1):
##         indexKecil = cariPosisiTerkecil(A, i, n)
##         if indexKecil != i:
##             swap(A, i, indexKecil)
##     selectionSort(L)

L = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
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
    insertionSort(L)
```

TUGAS

Tugas 1

```
Python 3.8.2 Shell
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>>>
= RESTART: D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\Tugas1.py
>>> sortNIM(daftar)
>>> checkNIM(daftar)
NIM : 2 Nama : Ahmad Kota Tinggal : Surakarta
NIM : 4 Nama : Eka Kota Tinggal : Boyolali
NIM : 5 Nama : Galuh Kota Tinggal : Wonogiri
NIM : 10 Nama : Ika Kota Tinggal : Sukoharjo
NIM : 13 Nama : Deni Kota Tinggal : Klaten
NIM : 18 Nama : Chandra Kota Tinggal : Surakarta
NIM : 23 Nama : Janto Kota Tinggal : Klaten
NIM : 29 Nama : Khalid Kota Tinggal : Purwodadi
NIM : 31 Nama : Fandi Kota Tinggal : Salatiga
NIM : 51 Nama : Budi Kota Tinggal : Sragen
NIM : 64 Nama : Hasan Kota Tinggal : Karanganyar
>>> |

Tugas1.py - D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\Tugas1.py (3.8.2)
File Edit Format Run Options Window Help
class Mahasiswa(object):
    listKuliah = []
    def __init__(self, nama, NIM, kota, us):
        self.nama = nama
        self.NIM = NIM
        self.kotaTinggal = kota
        self.uangSaku = us

c0 = Mahasiswa('Ika',10,'Sukoharjo', 240000)
c1 = Mahasiswa('Budi',51,'Sragen', 230000)
c2 = Mahasiswa('Ahmad',2,'Surakarta', 250000)
c3 = Mahasiswa('Chandra',18,'Surakarta', 235000)

c4 = Mahasiswa('Eka',4,'Boyolali', 240000)
c5 = Mahasiswa('Fandi',31,'Salatiga', 250000)
c6 = Mahasiswa('Deni',13,'Klaten', 245000)
c7 = Mahasiswa('Galuh',5,'Wonogiri', 245000)
c8 = Mahasiswa('Janto',23,'Klaten', 245000)
c9 = Mahasiswa('Hasan',64,'Karanganyar', 270000)
c10 = Mahasiswa('Khalid',29,'Purwodadi', 265000)

Daftar = [c0,c1,c2,c3,c4,c5,c6,c7,c8,c9,c10]

#Nomor 1
def swap(A, p, q):
    tmp = A[p]
    A[p] = A[q]
    A[q] = tmp

def sortNIM(daftar):
    n = len(daftar)
    for i in range(n-1):
        for j in range(n-i-1):
            if daftar[j].NIM > daftar[j+1].NIM:
                swap(daftar, j, j+1)

def checkNIM(a):
    n = len(a)
    for i in a:
        print('NIM : {} Nama : {} Kota Tinggal : {}'.format(i.NIM, i.nama, i.kotaTinggal))
```

Tugas 2

```
Python 3.8.2 Shell
File Edit Shell Debug Options Window Help
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Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\Tugas2.py
>>>
= RESTART: D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\Tugas2.py
>>> C = sortToC(A, B)
>>> C
[3, 4, 5, 6, 7, 12, 23, 34, 36, 38, 43, 56, 64, 76, 78, 89, 120, 190]
>>> |

Tugas2.py - D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\Tugas...
File Edit Format Run Options Window Help
A = [3,7,34,38,56,78,89,190]
B = [4,5,6,12,23,36,43,64,76,120]

def sortToC(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
    return c
```

Tugas 3

```
Python 3.8.2 Shell
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Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\Tugas3.py
bubble: 5.95104 detik
selection: 2.39992 detik
insertion: 2.61125 detik
>>> |

Tugas3.py - D:\KULI AH\Tugas Semester 4\praktikum algoritma Struktur data\Modul_5\Tuga...
File Edit Format Run Options Window Help
from time import time as detik
from random import shuffle as kocok

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

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
```