Nama : Galih Prayoga

NIM : L200180006

Kelas : A

Algostruk Modul 5

- Latihan

```
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

#Latihan 5.1
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)
#Latihan 5.2
def selectionSort(a):
    n = len(a)
    for i in range(n-1):
        indexKecil=cariPosisiYangTerkecil(a,i,n)
        if indexKecil != i:
            swap(a,i,indexKecil)

#Latihan 5.3
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
```

```
>>> K = [50, 20, 70, 10]
>>> swap(K, 1, 3)
>>> K
[50, 10, 70, 20]
>>>
>>> A = [18, 13, 44, 25, 66, 107, 78, 89]
>>> j = cariPosisiYangTerkecil(A, 2, len(A))
>>> j
3
>>>
>>> B = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
>>> bubbleSort(B)
>>> B
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
>>>
>>> C = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
>>> selectionSort(C)
>>> C
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
>>>
>>> D = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
>>> insertionSort(D)
>>> D
[2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
>>>
```

- Tugas
  1. Nomor 1

```
#1
class MhsTIF(object):

    def __init__(self,nama,NIM,asal,saku):
        self.nama = nama
        self.NIM = NIM
        self.asal = asal
        self.saku = saku

c0 = MhsTIF ('Ika','L200180001','Sukoharjo', 240000)
c1 = MhsTIF ('Budi','L200180010','Sragen', 230000)
c2 = MhsTIF ('Ahmad','L200180002','Surakarta', 250000)
c3 = MhsTIF ('Chandra','L200180004','Surakarta', 230000)
c4 = MhsTIF ('Eka','L200180005','Boyolali', 240000)
c5 = MhsTIF ('Fandi','L20018006','Salatiga', 250000)
c6 = MhsTIF ('Deni','L200180007','Klaten', 245000)
c7 = MhsTIF ('Galuh','L20018008','Wonogiri', 245000)
c8 = MhsTIF ('Janto','L200180009','Klaten', 245000)
c9 = MhsTIF ('Hasan','L2001800011','Karanganyar', 270000)
c10 = MhsTIF ('Khalid','L200180012','Purwodadi', 265000)
Mhs = [c0, c1, c2, c3, c4, c5, c6, c7, c8, c9, c10]

def urutkan(A):
    baru = {}
    for i in range(len(A)):
        baru[A[i].nama] = A[i].NIM
    listofTuples = sorted(baru.items(), key = lambda x: x[1])
    for elemen in listofTuples :
        print(elemen[0], ":", elemen[1])
```

```
>>> urutkan(Mhs)
Ika : L200180001
Hasan : L2001800011
Ahmad : L200180002
Chandra : L200180004
Eka : L200180005
Deni : L200180007
Janto : L200180009
Budi : L200180010
Khalid : L200180012
Fandi : L20018006
Galuh : L20018008
>>>
```

  2. Nomor 2

```
#2
def bubbleSort(arr):
    n = len(arr)
    for i in range (n):
        for j in range(0, n-i-1):
            if arr[j] > arr[j+1] :
                arr[j], arr[j+1] = arr[j+1], arr[j]

    return arr
def gabung(a,b):
    c = []
    c = a+b
    n = len(c)
    for i in range(n):
        for j in range(0, n-i-1):
            if c[j] > c[j+1] :
                c[j], c[j+1] = c[j+1], c[j]
    return c
```

```
>>> K = [18, 13, 44, 25, 66, 107, 78, 89]
>>> L = [4, 9, 17, 33, 21, 3, 55]
>>> K, L = bubbleSort(K), bubbleSort(L)
>>> gabung(K, L)
[3, 4, 9, 13, 17, 18, 21, 25, 33, 44, 55, 66, 78, 89, 107]
>>>
```

3. Nomor 3

```
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));
```

```
bubble: 9.04878 detik
selection: 3.21776 detik
insertion: 3.77781 detik
>>>
```