

LAPORAN PRAKTIKUM
ALGORITMA DAN STRUKTUR DATA
MODUL 5
PENGURUTAN



Disusun oleh:
Bima Triadmaja
L200210137
E

TEKNIK INFORMATIKA
FAKULTAS KOMUNIKASI DAN INFORMATIKA
UNIVERSITAS MUHAMMADIYAH SURAKARTA
2022/2023

5.4 Soal-soal untuk Mahasiswa

Nomor 1 :

#No.1

```
class Manusia(object):
    keadaan = 'lapar'
    def __init__(self,nama):
        self.nama = nama
    def ucapkanSalam(self):
        print("salaam, namaku",self.nama)
    def makan(self, s):
        print("Saya baru saja makan", s)
        self.keadaan = 'kenyang'
    def olahraga(self,k):
        print("Saya baru saja latihan", k)
        self.keadaan = 'lapar'
    def mengalikanDenganDua(self,n):
        return n*2

class Mahasiswa(Manusia):
    listKuliah = []
    def __init__(self,nama,NIM,kota,us):
        self.nama = nama
        self.NIM = NIM
        self.kotaTinggal = kota
        self.uangSaku = us
    def __str__(self):
        s = self.nama + ', NIM ' + str(self.NIM) \
            + ', berasal dari ' + self.kotaTinggal \
            + ', mempunyai Rp ' + str(self.uangSaku) \
            + ' perbulan.'
        return s
    def ambilNama(self):
        return self.nama
    def ambilNIM(self):
```

```

        return self.NIM
def ambilUangSaku(self):
    return self.uangSaku
def makan(self,s):
    print("Saya baru saja makan",s)
    self.keadaan = 'kenyang'
def ambilKotaTinggal(self):
    return self.kotaTinggal
def perbaruiKotaTinggal(self,kota):
    self.kotaTinggal = kota
def tambahUangSaku(self,nom):
    self.uangSaku += nom
def ambilKuliah(self, matkul):
    self.listKuliah.append(matkul)
def hapusMatkul(self, matkul):
    self.listKuliah.remove(matkul)

class MhsTIF(Mahasiswa):
    def katakanPy(self):
        print('Python is cool.')

def insertionSort(a):
    n = len(a)
    for i in range(1,n):
        nilai = a[i]
        pos = i
        while pos > 0 and nilai.NIM < a[pos - 1].NIM:
            a[pos] = a[pos - 1]
            pos = pos - 1
        a[pos] = nilai

def cekNIM(a):
    for i in a:
        print(i)

```


```

c0 = Mahasiswa('Bima','L200210137','Sukoharjo', 240000)
c1 = Mahasiswa('Triadmaja','L200210351','Sragen', 230000)
c2 = Mahasiswa('Risma','L200210302','Surakarta', 250000)
c3 = Mahasiswa('Nanda','L200210318','Surakarta', 235000)
c4 = Mahasiswa('Fatika','L200210304','Boyolali', 240000)
c5 = Mahasiswa('Sari','L200210331','Salatiga', 250000)
c6 = Mahasiswa('Dimas','L200210313','Klaten', 245000)
c7 = Mahasiswa('Cahyo','L200210305','Wonogiri', 245000)
c8 = Mahasiswa('Vikki','L200210323','Klaten', 245000)
c9 = Mahasiswa('Gilang','L200210364','Karanganyar', 270000)
c10 = Mahasiswa('Eko','L200210329','Purwodadi', 265000)

print('')
print('Sudah selesai.')

print('\n--- Oleh L200210137 ---')

```

 IDLE Shell 3.10.1

File Edit Shell Debug Options Window Help

Python 3.10.1 (tags/v3.10.1:2cd268a, Dec 6 2021, 19:10:37) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

```

>>> = RESTART: C:\Users\Infinity\OneDrive\Documents\Kuliah\Semester 4\Prak ASD E\Modul 5\No1.py

Sudah selesai.

--- Oleh L200210137 ---
>>> #No.1
>>> a = [c0,c1,c2,c3,c4,c5,c6,c7,c8,c9,c10]
>>> insertionSort(a)
>>> cekNIM(a)
Bima, NIM L200210137, berasal dari Sukoharjo, mempunyai Rp 240000 perbulan.
Risma, NIM L200210302, berasal dari Surakarta, mempunyai Rp 250000 perbulan.
Fatika, NIM L200210304, berasal dari Boyolali, mempunyai Rp 240000 perbulan.
Cahyo, NIM L200210305, berasal dari Wonogiri, mempunyai Rp 245000 perbulan.
Dimas, NIM L200210313, berasal dari Klaten, mempunyai Rp 245000 perbulan.
Nanda, NIM L200210318, berasal dari Surakarta, mempunyai Rp 235000 perbulan.
Vikki, NIM L200210323, berasal dari Klaten, mempunyai Rp 245000 perbulan.
Eko, NIM L200210329, berasal dari Purwodadi, mempunyai Rp 265000 perbulan.
Sari, NIM L200210331, berasal dari Salatiga, mempunyai Rp 250000 perbulan.
Triadmaja, NIM L200210351, berasal dari Sragen, mempunyai Rp 230000 perbulan.
Gilang, NIM L200210364, berasal dari Karanganyar, mempunyai Rp 270000 perbulan.
>>>

```


Nomor 2 :

#No.2

```
def urutkan(a,b):
    c = a + b
    for x in range(len(c)):
        terkecil = x
        for y in range(x+1, len(c)):
            if c[terkecil] > c[y]:
                terkecil = y
        c[x], c[terkecil] = c[terkecil], c[x]
    return c

print('')
print('Sudah selesai.')

print('\n--- Oleh L200210137 ---')
```

 IDLE Shell 3.10.1

File Edit Shell Debug Options Window Help

Python 3.10.1 (tags/v3.10.1:2cd268a, Dec 6 2021, 19:10:37) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

```
>>> = RESTART: C:\Users\Infinity\OneDrive\Documents\Kuliah\Semester 4\Prak ASD E\Modul 5\No2.py
Sudah selesai.
--- Oleh L200210137 ---
>>> #No.2
>>> a = [88,28,90,86,76]
>>> b = [1,7,17,9,12]
>>> urutkan(a, b)
[1, 7, 9, 12, 17, 28, 76, 86, 88, 90]
>>> |
```

Nomor 3 :

#No.3

```
from time import time as waktu
from random import shuffle as acak
```

```
def swap(A,p,q):
```

```
    tmp = A[p]
```

```
    A[p] = A[q]
```

```
    A[q] = tmp
```

```
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 cariPosisiTerkecil(A, x, y):
```

```
    posisiTerkecil = x
```

```
    for i in range(x+1, y):
```

```
        if A[i] < A[posisiTerkecil]:
```

```
            posisiTerkecil = i
```

```
    return posisiTerkecil
```

```
def selectionSort(A):
```

```
    n = len(A)
```

```
    for i in range(n-1):
```

```
        indexKecil = cariPosisiTerkecil(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]
```

```
        posisi = i
```

```
        while posisi > 0 and nilai < A[posisi-1]:
```

```
            A[posisi] = A[posisi-1]
```

```
            posisi = posisi-1
```

```
        A[posisi] = nilai
```

```
ac = [i for i in range(1,6001)]
```

```
acak(ac)
```

```


u_bubble = ac[:]
u_select = ac[:]
u_insert = ac[:]

a = waktu();bubbleSort(u_bubble);b=waktu();print("~~~Bubble
: %g detik~~~"%(b-a));
a =
waktu();selectionSort(u_select);b=waktu();print("~~~Selection
: %g detik~~~"%(b-a));
a =
waktu();insertionSort(u_insert);b=waktu();print("~~~Insertion
: %g detik~~~"%(b-a));

print('')
print('Sudah selesai.')

print('\n--- Oleh L200210137 ---')

```

 IDLE Shell 3.10.1

File Edit Shell Debug Options Window Help

```

Python 3.10.1 (tags/v3.10.1:2cd268a, Dec 6 2021, 19:10:37) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:\Users\Infinity\OneDrive\Documents\Kuliah\Semester 4\Prak ASD E\Modul 5\No3.py
~~~Bubble : 2.10676 detik~~~
~~~Selection : 0.650053 detik~~~
~~~Insertion : 0.914662 detik~~~

Sudah selesai.

--- Oleh L200210137 ---
>>>

```