

Laporan Praktikum Algoritma dan Struktur Data

NIM : L200180014
Nama : Andika Wirapala F. A.
Modul : 5

Latihan

Cari indeks nilai terkecil

```
latihan.py x
1 # 5-Pengurutan
2
3 def swap(A, p, q):
4     tmp = A[p]
5     A[p] = A[q]
6     A[q] = tmp
7
8
9 K = [10, 11, 12, 13, 14]
10 swap(K, 1, 3) # menukar indeks ke-1 dengan 3
11 print(K)
12
13 def cariPosisiTerkecil(A, dariSini, sampaiSini):
14     posisiTerkecil = dariSini
15     for i in range(dariSini + 1, sampaiSini):
16         if A[i] < A[posisiTerkecil]:
17             posisiTerkecil = i
18     return posisiTerkecil
19
20 A = [18, 13, 44, 25, 66, 107, 78, 89]
21 print(cariPosisiTerkecil(A, 2, len(A))) # return 3
22 print(cariPosisiTerkecil(A, 0, len(A))) # return 1
```

```
latihan x
/usr/bin/python3.8 /usr/share/pycharm/helpers/pydev/pydev
--mode=client --port=45135
import sys; print('Python %s on %s' % (sys.version, sys.p
sys.path.extend(['/home/dikawfa/Documents/Kuliah/Semester
4/AlgoStruk/Praktikum/5/kode']))
Python 3.8.1 (default, Jan 22 2020, 06:38:00)
In[2]: runfile('/home/dikawfa/Documents/Kuliah/Semester
4/AlgoStruk/Praktikum/5/kode/latihan.py',
wdir='/home/dikawfa/Documents/Kuliah/Semester
4/AlgoStruk/Praktikum/5/kode')
[10, 13, 12, 11, 14]
3
1
In[3]:
```

Bubble Sort

```
latihan.py x
15 for i in range(dariSini + 1, sampaiSini):
16     if A[i] < A[posisiTerkecil]:
17         posisiTerkecil = i
18     return posisiTerkecil
19
20 A = [18, 13, 44, 25, 66, 107, 78, 89]
21 # print(cariPosisiTerkecil(A, 2, len(A))) # return 3
22 # print(cariPosisiTerkecil(A, 0, len(A))) # return 1
23
24 def bubbleSort(A):
25     n = len(A)
26     for i in range(n-1):
27         for j in range(n-i-1):
28             if A[j] > A[j+1]:
29                 swap(A, j, j+1)
30     return A
31
32 worst = [99, 87, 76, 65, 53, 42, 33, 20, 11, 3]
33 average = [3, 20, 11, 76, 87, 99, 42, 53, 33, 65]
34 best = [3, 11, 20, 33, 42, 53, 65, 76, 87, 99]
35
36 hasil1 = bubbleSort(worst)
37 hasil2 = bubbleSort(average)
38 hasil3 = bubbleSort(best)
39 print('Hasil worst case:', hasil1)
40 print('Hasil avrg. case:', hasil2)
41 print('Hasil best case:', hasil3)
42
```

```
latihan x
/usr/bin/python3.8 /usr/share/pycharm/helpers/pydev/pydev
--mode=client --port=38727
import sys; print('Python %s on %s' % (sys.version, sys.pl
sys.path.extend(['/home/dikawfa/Documents/Kuliah/Semester
4/AlgoStruk/Praktikum/5/kode']))
Python 3.8.1 (default, Jan 22 2020, 06:38:00)
In[2]: runfile('/home/dikawfa/Documents/Kuliah/Semester
4/AlgoStruk/Praktikum/5/kode/latihan.py',
wdir='/home/dikawfa/Documents/Kuliah/Semester
4/AlgoStruk/Praktikum/5/kode')
Hasil worst case: [3, 11, 20, 33, 42, 53, 65, 76, 87, 99]
Hasil avrg. case: [3, 11, 20, 33, 42, 53, 65, 76, 87, 99]
Hasil best case: [3, 11, 20, 33, 42, 53, 65, 76, 87, 99]
In[3]:
```

SelectionSort

```
46 def selectionSort(A):
47     n = len(A)
48     for i in range(n-1):
49         indexKecil = cariPosisiTerkecil(A, i, n)
50         if indexKecil != i:
51             swap(A, i, indexKecil)
52     return A
53
54 ss1 = selectionSort(worst)
55 ss2 = selectionSort(average)
56 ss3 = selectionSort(best)
57 print(ss1)
58 print(ss2)
59 print(ss3)
60
```

```
wdir = '/home/dikawfa/Documents/Kuliah/Semester
4/AlgoStruk/Praktikum/5/kode')
In[4]: runfile('/home/dikawfa/Documents/Kuliah/Semester
4/AlgoStruk/Praktikum/5/kode/latihan.py',
wdir='/home/dikawfa/Documents/Kuliah/Semester
4/AlgoStruk/Praktikum/5/kode')
[3, 11, 20, 33, 42, 53, 65, 76, 87, 99]
[3, 11, 20, 33, 42, 53, 65, 76, 87, 99]
[3, 11, 20, 33, 42, 53, 65, 76, 87, 99]

In[5]:
```

Insertion Sort

```
62 # Insertion Sort
63 def insertionSort(A):
64     n = len(A)
65     for i in range(1, n):
66         nilai = A[i]
67         pos = i
68         while pos > 0 and nilai < A[pos-1]:
69             A[pos] = A[pos-1]
70             pos = pos-1
71         A[pos] = nilai
72     return A
73
74 is1 = insertionSort(worst)
75 is2 = insertionSort(average)
76 is3 = insertionSort(best)
77 print(is1)
78 print(is2)
79 print(is3)
80
```

```
4/AlgoStruk/Praktikum/5/kode/latihan.py',
wdir='/home/dikawfa/Documents/Kuliah/Semester
4/AlgoStruk/Praktikum/5/kode')
[3, 11, 20, 33, 42, 53, 65, 76, 87, 99]
[3, 11, 20, 33, 42, 53, 65, 76, 87, 99]
[3, 11, 20, 33, 42, 53, 65, 76, 87, 99]

In[3]:
```


TUGAS

1.

```
latihan.py x Olpy x
1 class MhsTIF(object):
2     def __init__(self, nama, nim, asal, us):
3         self.nama = nama
4         self.nim = nim
5         self.asal = asal
6         self.uangsaku = us
7
8     def swap(A, p, q):
9         temp = A[p]
10        A[p] = A[q]
11        A[q] = temp
12
13    def nimurut(A):
14        n = len(A)
15        for i in range(n - 1):
16            for j in range(n - i - 1):
17                if A[j].nim > A[j + 1].nim:
18                    swap(A, j, j + 1)
19        listUrut = []
20        for k in A:
21            listUrut.append((k.nim, k.nama, k.asal, k.uangsaku))
22        return listUrut
23
24    daftar = [(MhsTIF('Andi', 'L200210060', 'Solo', 10000)),
25              (MhsTIF('Budi', 'L200200003', 'Konoha', 2000)),
26              (MhsTIF('Cici', 'L200210085', 'Sukoharjo', 15000)),
27              (MhsTIF('Dyah', 'L200210065', 'Pekalongan', 22000)),
28              (MhsTIF('Ekky', 'L200210070', 'Pabelan', 23000)),
29              (MhsTIF('Fred', 'L200200081', 'New Yoke', 25000)),
30              (MhsTIF('Gery', 'L200210045', 'Seberang', 25000)),
31              (MhsTIF('Pipit', 'L200210030', 'Batang Pisang', 19000)),
32              (MhsTIF('Nopnop', 'L200210026', 'Pluto', 18000)),
33              (MhsTIF('Billy', 'L200200075', 'Laut', 21000))]
```

```
01 x
/usr/bin/python3.8 /usr/share/pycharm/helpers/pydev
import sys; print('Python %s on %s' % (sys.version, sys.path.extend(['/home/dikawfa/Documents/Kuliah/Ser
Python 3.8.1 (default, Jan 22 2020, 06:38:00)
In[2]: runfile('/home/dikawfa/Documents/Kuliah/Ser
In[3]: nimurut(daftar)
Out[3]:
[('L200200003', 'Budi', 'Konoha', 2000),
 ('L200200075', 'Billy', 'Laut', 21000),
 ('L200200081', 'Fred', 'New Yoke', 25000),
 ('L200210026', 'Nopnop', 'Pluto', 18000),
 ('L200210030', 'Pipit', 'Batang Pisang', 19000),
 ('L200210045', 'Gery', 'Seberang', 25000),
 ('L200210060', 'Andi', 'Solo', 10000),
 ('L200210065', 'Dyah', 'Pekalongan', 22000),
 ('L200210070', 'Ekky', 'Pabelan', 23000),
 ('L200210085', 'Cici', 'Sukoharjo', 15000)]

In[4]:
```

2.

```

1  def gabungDuaListUrut(A, B):
2      la = len(A)
3      lb = len(B)
4      C = []
5      i = 0
6      j = 0
7
8      while i < la and j < lb:
9          if A[i] < B[j]:
10             C.append(A[i])
11             i += 1
12          else:
13             C.append(B[j])
14             j += 1
15      while i < la:
16          C.append(A[i])
17          i += 1
18      while j < lb:
19          C.append(B[j])
20          j += 1
21      return C
22
23      daftar1 = [4, 7, 9, 12, 19]
24      daftar2 = [2, 5, 8, 15]
25

```

Python Console:

```

/usr/bin/python3.8 /usr/share/pycharm/helpers/pydev/pydevconsole.py
import sys; print('Python %s on %s' % (sys.version, sys.platform))
sys.path.extend(['/home/dikawfa/Documents/Kuliah/Semester 1'])

Python 3.8.1 (default, Jan 22 2020, 06:38:00)
In[2]: runfile('/home/dikawfa/Documents/Kuliah/Semester 1', wdir='/home/dikawfa/Documents/Kuliah/Semester 1')
In[3]: gabungDuaListUrut(daftar1, daftar2)
Out[3]: [2, 4, 5, 7, 8, 9, 12, 15, 19]
In[4]: gabungDuaListUrut([1, 3, 5, 7], [0, 2, 4, 10])
Out[4]: [0, 1, 2, 3, 4, 5, 7, 10]
In[5]: X = [12, 15, 22, 23]
In[6]: Y = [10, 13, 17]
In[7]: gabungDuaListUrut(X, Y)
Out[7]: [10, 12, 13, 15, 17, 22, 23]
In[8]:

```

3.

```

34      nilai = A[i]
35      pos = i
36      while pos > 0 and nilai < A[pos - 1]:
37          A[pos] = A[pos - 1]
38          pos = pos - 1
39      A[pos] = nilai
40
41
42  from time import time as detik
43  from random import shuffle as kocok
44
45  k = [i for i in range(1, 6001)]
46  kocok(k)
47  u_bub = k[:]
48  u_sel = k[:]
49  u_ins = k[:]
50
51  aw = detik()
52  bubblesort(u_bub)
53  ak = detik()
54  print('Buble      : %g detik' % (ak - aw))
55  aw = detik()
56  selectionsort(u_sel)
57  ak = detik()
58  print('Selection  : %g detik' % (ak - aw))
59  aw = detik()
60  insertionsort(u_ins)
61  ak = detik()
62  print('Insertion   : %g detik' % (ak - aw))
63

```

Python Console:

```

/usr/bin/python3.8 /usr/share/pycharm/helpers/pydev/pydevconsole.py
import sys; print('Python %s on %s' % (sys.version, sys.platform))
sys.path.extend(['/home/dikawfa/Documents/Kuliah/Semester 1'])

Python 3.8.1 (default, Jan 22 2020, 06:38:00)
Type 'copyright', 'credits' or 'help()' to access the Python documentation online
Type 'copyright', 'credits' or 'help()' to access the Python documentation online
IPython 7.11.0 -- An enhanced IPython console: using IPython 7.11.0
Python 3.8.1 (default, Jan 22 2020, 06:38:00)
[GCC 9.2.0] on linux
In[2]: runfile('/home/dikawfa/Documents/Kuliah/Semester 1', wdir='/home/dikawfa/Documents/Kuliah/Semester 1')
Buble      : 3.71157 detik
Selection  : 1.35501 detik
Insertion   : 1.64916 detik
In[3]:
...:

```