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MODUL 4

1.py - D:/KULIAH/Semester 4/Prak. Algoritma dan Struktur data/1.py (3.8.2)

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```
class MhsTif(object):
    def __init__(self, nama, nim, kota, uangsaku):
        self.nama = nama
        self.nim = nim
        self.kotaTinggal = kota
        self.uangSaku = uangsaku

c0 = MhsTif("Jainal", 10, "Sukoharjo", 240000)
c1 = MhsTif("Fandit", 51, "Sragen", 230000)
c2 = MhsTif("Diko", 2, "Surakarta", 250000)
c3 = MhsTif("Ijul", 18, "Surakarta", 235000)
c4 = MhsTif("Ghani", 4, "Boyolali", 240000)
c5 = MhsTif("Rizki", 31, "Salatiga", 250000)
c6 = MhsTif("Bagus", 13, "Klaten", 245000)
c7 = MhsTif("Iqbal", 5, "Wonogiri", 245000)
c8 = MhsTif("Khalid", 23, "Klaten", 245000)
c9 = MhsTif("Azka", 64, "Karanganyar", 270000)
c10 = MhsTif("Bima", 29, "Purwodadi", 265000)

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

#NOMER 1
def cariKotaTinggal(list, target):
    a = []
    for i in list :
        if i.kotaTinggal == target:
            a.append(list.index(i))
    return a
```

Python 3.8.2 Shell

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```
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 22:45:29) [MSC v.1916 32 bit (In
tel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: D:/KULIAH/Semester 4/Prak. Algoritma dan Struktur data/1.py =====
>>> a = cariKotaTinggal(Daftar, "Klaten")
>>> a
[6, 8]
>>>
```

2.py - D:/KULIAH/Semester 4/Prak. Algoritma dan Struktur data/2.py (3.8.2)

File Edit Format Run Options Window Help

```
class MhsTif(object):
    def __init__(self, nama, nim, kota, uangsaku):
        self.nama = nama
        self.nim = nim
        self.kotaTinggal = kota
        self.uangSaku = uangsaku

c0 = MhsTif("Jainal", 10, "Sukoharjo", 240000)
c1 = MhsTif("Fandit", 51, "Sragen", 230000)
c2 = MhsTif("Diko", 2, "Surakarta", 250000)
c3 = MhsTif("Ijul", 18, "Surakarta", 235000)
c4 = MhsTif("Ghani", 4, "Boyolali", 240000)
c5 = MhsTif("Rizki", 31, "Salatiga", 250000)
c6 = MhsTif("Bagus", 13, "Klaten", 245000)
c7 = MhsTif("Iqbal", 5, "Wonogiri", 245000)
c8 = MhsTif("Khalid", 23, "Klaten", 245000)
c9 = MhsTif("Azka", 64, "Karanganyar", 270000)
c10 = MhsTif("Bima", 29, "Purwodadi", 265000)

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

#NOMER 2
def cariUangSakuTerkecil(list):
    temp = list[0].uangSaku
    for i in list[1:]:
        if i.uangSaku < temp:
            temp = i.uangSaku
    return temp
```

Python 3.8.2 Shell

File Edit Shell Debug Options Window Help

```
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 22:45:29) [MSC v.1916 32 bit (In
tel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: D:/KULIAH/Semester 4/Prak. Algoritma dan Struktur data/2.py =====
>>> a = cariUangSakuTerkecil(Daftar)
>>> a
230000
>>>
```

3.py - D:/KULIAH/Semester 4/Prak. Algoritma dan Struktur data/3.py (3.8.2)

File Edit Format Run Options Window Help

```
class MhsTif(object):
    def __init__(self, nama, nim, kota, uangsaku):
        self.nama = nama
        self.nim = nim
        self.kotaTinggal = kota
        self.uangSaku = uangsaku

c0 = MhsTif("Jainal", 10, "Sukoharjo", 240000)
c1 = MhsTif("Fandit", 51, "Sragen", 230000)
c2 = MhsTif("Diko", 2, "Surakarta", 250000)
c3 = MhsTif("Ijul", 18, "Surakarta", 235000)
c4 = MhsTif("Ghani", 4, "Boyolali", 240000)
c5 = MhsTif("Rizki", 31, "Salatiga", 250000)
c6 = MhsTif("Bagus", 13, "Klaten", 245000)
c7 = MhsTif("Iqbal", 5, "Wonogiri", 245000)
c8 = MhsTif("Khalid", 23, "Klaten", 245000)
c9 = MhsTif("Azka", 64, "Karanganyar", 270000)
c10 = MhsTif("Bima", 29, "Purwodadi", 265000)

Daftar = [c0, c1, c2, c3, c4, c5, c6, c7, c8, c9, c10]
#NOMER 3
def uangSakuterkecil():
    a = Daftar[0].uangSaku
    x  =[]
    for i in range(len(Daftar)):
        if a> Daftar[i].uangSaku:
            a = Daftar[i].uangSaku
    for i in range(len(Daftar)):
        if Daftar[i].uangSaku == a:
            x.append(Daftar[i].nama)
    return x
```

Ln: 8 Col: 44

```
>>>
===== RESTART: D:/KULIAH/Semester 4/Prak. Algoritma dan Struktur data/3.py =====
>>> uangSakuterkecil()
['Fandit']
>>>
```

4.py - D:/KULIAH/Semester 4/Prak. Algoritma dan Struktur data/4.py (3.8.2)

File Edit Format Run Options Window Help

```
class MhsTif(object):
    def __init__(self, nama, nim, kota, uangsaku):
        self.nama = nama
        self.nim = nim
        self.kotaTinggal = kota
        self.uangSaku = uangsaku

c0 = MhsTif("Jainal", 10, "Sukoharjo", 240000)
c1 = MhsTif("Fandit", 51, "Sragen", 230000)
c2 = MhsTif("Diko", 2, "Surakarta", 250000)
c3 = MhsTif("Ijul", 18, "Surakarta", 235000)
c4 = MhsTif("Ghani", 4, "Boyolali", 240000)
c5 = MhsTif("Rizki", 31, "Salatiga", 250000)
c6 = MhsTif("Bagus", 13, "Klaten", 245000)
c7 = MhsTif("Iqbal", 5, "Wonogiri", 245000)
c8 = MhsTif("Khalid", 23, "Klaten", 245000)
c9 = MhsTif("Azka", 64, "Karanganyar", 270000)
c10 = MhsTif("Bima", 29, "Purwodadi", 265000)

Daftar = [c0, c1, c2, c3, c4, c5, c6, c7, c8, c9, c10]
#NOMER 4
def uangSakukurang25k():
    x =[]
    for i in range(len(Daftar)):

        if Daftar[i].uangSaku < 250000:
            x.append(Daftar[i].nama)
    return x
```

Ln: 17 Col: 46

```
===== RESTART: D:/KULIAH/Semester 4/Prak. Algoritma dan Struktur data/4.py =====
>>> uangSakukurang25k()
['Jainal', 'Fandit', 'Ijul', 'Ghani', 'Bagus', 'Iqbal', 'Khalid']
>>>
```

5.py - D:/KULIAH/Semester 4/Prak. Algoritma dan Struktur data/5.py (3.8.2)

File Edit Format Run Options Window Help

```
c2 = MhsTif("Diko", 2, "Surakarta", 250000)
c3 = MhsTif("Ijul", 18, "Surakarta", 235000)
c4 = MhsTif("Ghani", 4, "Boyolali", 240000)
c5 = MhsTif("Rizki", 31, "Salatiga", 250000)
c6 = MhsTif("Bagus", 13, "Klaten", 245000)
c7 = MhsTif("Iqbal", 5, "Wonogiri", 245000)
c8 = MhsTif("Khalid", 23, "Klaten", 245000)
c9 = MhsTif("Azka", 64, "Karanganyar", 270000)
c10 = MhsTif("Bima", 29, "Purwodadi", 265000)

Daftar = [c0, c1, c2, c3, c4, c5, c6, c7, c8, c9, c10]
#NOMER 5
class node(object):
    def __init__ (self, data, next = None):
        self.data = data
        self.next = next

    def cari(self, dicari):
        cur = self
        while cur is not None:
            if cur.next != None:
                if cur.data != dicari:
                    cur = cur.next
                else:
                    print ("Data", dicari, "ada dalam Linked List")
                    break
            elif cur.next == None:
                print ("Data", dicari, "tidak ada dalam Linked List")
                break
```

Ln: 29 Col: 0

```
>>> a = node(17)
>>> draf = a
>>> a.next = node(19)
>>> a = a.next
>>> a.next = node(45)
>>> a = a.next
>>> a.next = node(11)
>>> a = a.next
>>> draf.cari(45)
Data 45 ada dalam Linked List
>>> draf.cari(25)
Data 25 tidak ada dalam Linked List
>>>
```

6.py - D:/KULIAH/Semester 4/Prak. Algoritma dan Struktur data/6.py (3.8.2)

File Edit Format Run Options Window Help

```
class MhsTif(object):
    def __init__(self, nama, nim, kota, uangsaku):
        self.nama = nama
        self.nim = nim
        self.kotaTinggal = kota
        self.uangSaku = uangsaku

c0 = MhsTif("Jainal", 10, "Sukoharjo", 240000)
c1 = MhsTif("Fandit", 51, "Sragen", 230000)
c2 = MhsTif("Diko", 2, "Surakarta", 250000)
c3 = MhsTif("Ijul", 18, "Surakarta", 235000)
c4 = MhsTif("Ghani", 4, "Boyolali", 240000)
c5 = MhsTif("Rizki", 31, "Salatiga", 250000)
c6 = MhsTif("Bagus", 13, "Klaten", 245000)
c7 = MhsTif("Iqbal", 5, "Wonogiri", 245000)
c8 = MhsTif("Khalid", 23, "Klaten", 245000)
c9 = MhsTif("Azka", 64, "Karanganyar", 270000)
c10 = MhsTif("Bima", 29, "Purwodadi", 265000)

Daftar = [c0, c1, c2, c3, c4, c5, c6, c7, c8, c9, c10]
#NOMER 6
def binSe(kumpulan, target):
    low = 0
    high = len(kumpulan)-1
    while low <= high:
        mid = (high+low)//2
        if kumpulan[mid] == target:
            return mid
        elif target < kumpulan[mid]:
            high = mid-1
        else:
            low = mid+1
    return False
```

Ln: 20 Col: 0

```
===== RESTART: D:/KULIAH/Semester 4/Prak. Algoritma dan Struktur data/6.py =====
>>> kumpulan = [2, 4, 5, 10, 13, 18, 23, 29, 31, 51, 64]
>>> (binSe(kumpulan, 5))
2
>>>
```

7.py - D:/KULIAH/Semester 4/Prak. Algoritma dan Struktur data/7.py (3.8.2)

File Edit Format Run Options Window Help

```
class MhsTif(object):
    def __init__(self, nama, nim, kota, uangsaku):
        self.nama = nama
        self.nim = nim
        self.kotaTinggal = kota
        self.uangSaku = uangsaku
c0 = MhsTif("Jainal", 10, "Sukoharjo", 240000)
c1 = MhsTif("Fandit", 51, "Sragen", 230000)
c2 = MhsTif("Diko", 2, "Surakarta", 250000)
c3 = MhsTif("Ijul", 18, "Surakarta", 235000)
c4 = MhsTif("Ghani", 4, "Boyolali", 240000)
c5 = MhsTif("Rizki", 31, "Salatiga", 250000)
c6 = MhsTif("Bagus", 13, "Klaten", 245000)
c7 = MhsTif("Iqbal", 5, "Wonogiri", 245000)
c8 = MhsTif("Khalid", 23, "Klaten", 245000)
c9 = MhsTif("Azka", 64, "Karanganyar", 270000)
c10 = MhsTif("Bima", 29, "Purwodadi", 265000)
Daftar = [c0, c1, c2, c3, c4, c5, c6, c7, c8, c9, c10]
#NOMER 7
def binSeMass(kumpulan, target):
    temp = []
    low = 0
    high = len(kumpulan)-1
    while low <= high :
        mid = (high+low)//2
        if kumpulan[mid] == target:
            midKiri = mid-1
            while kumpulan[midKiri] == target:
                temp.append(midKiri)
                midKiri = midKiri-1
            temp.append(mid)
            midKanan = mid+1
            while kumpulan[midKanan] == target:
                temp.append(midKanan)
                midKanan = midKanan+1
            return temp
        elif target < kumpulan[mid]:
            high = mid-1
        else:
            low = mid+1
    return False
```

```
>>> kumpulan = [2, 4, 5, 6, 6, 6, 8, 9, 9, 10, 11, 12, 13, 13, 14]
>>> (binSeMass(kumpulan, 6))
[3, 4, 5]
>>>
```

Nomer 8
Ada dua pola
Pertama menggunakan konsep Big-O. Dimana yang dipakai
adalah rumus O(log n) dengan rincian 1 = 1, 2 = 2, 4 = 3, 10 = 4, 100 = 7, 1000=10.
Di mana log berasal dari pangkat log berbasis 2. Dengan begitu dapat mengetahui jumlah
maksimal tebakan.
Untuk pola sendiri:
apabila ingin menebak angka 70

a = nilai tebakan pertama // 2
tebakan selanjutnya = nilai tebakan "lebih dari" + a
*jika hasil tebakan selanjutnya "kurang dari", maka nilai yang dipakai
tetap nilai lebih dari sebelumnya*
a = a // 2
Simulasi
tebakan ke 1: 50 (mengambil nilai tengah) jawaban= "lebih dari itu"
tebakan ke 2: 75 (dari 50 + 25) jawaban = "kurang dari itu"
tebakan ke 3: 62 (dari 50 + 12) jawaban = "lebih dari itu"
tebakan ke 4: 68 (dari 62 + 6) jawaban = "lebih dari itu"
tebakan ke 5: 71 (dari 68 + 3) jawaban = "kurang dari itu"
tebakan ke 6: 69 (dari 68 + 1) jawaban = "lebih dari itu"
tebakan ke 7: antara 71 dan 69 hanya ada 1 angka = 70!!!

Kedua menggunakan barisan geometri Sn = 2^n
barisan yang terjadi adalah : 2, 4, 8, 16, 32, 64
Misal angka yang akan diebak adalah 68
Tebakan ke-1 : 64 dijawab lebih dari itu
Tebakan ke-2 : 96(dari 64 + 32) dijawab "Kurang dari itu"
Tebakan ke-3 : 80(dari 64 + 16) dijawab "Kurang dari itu"
Tebakan ke-4 : 72(dari 64 + 8) dijawab "Kurang dari itu"
Tebakan ke-5 : 68(dari 64 + 4) dijawab "Lebih dari itu"
Tebakan ke-6 : 70(dari 68 + 2) dijawab "TEPAT"