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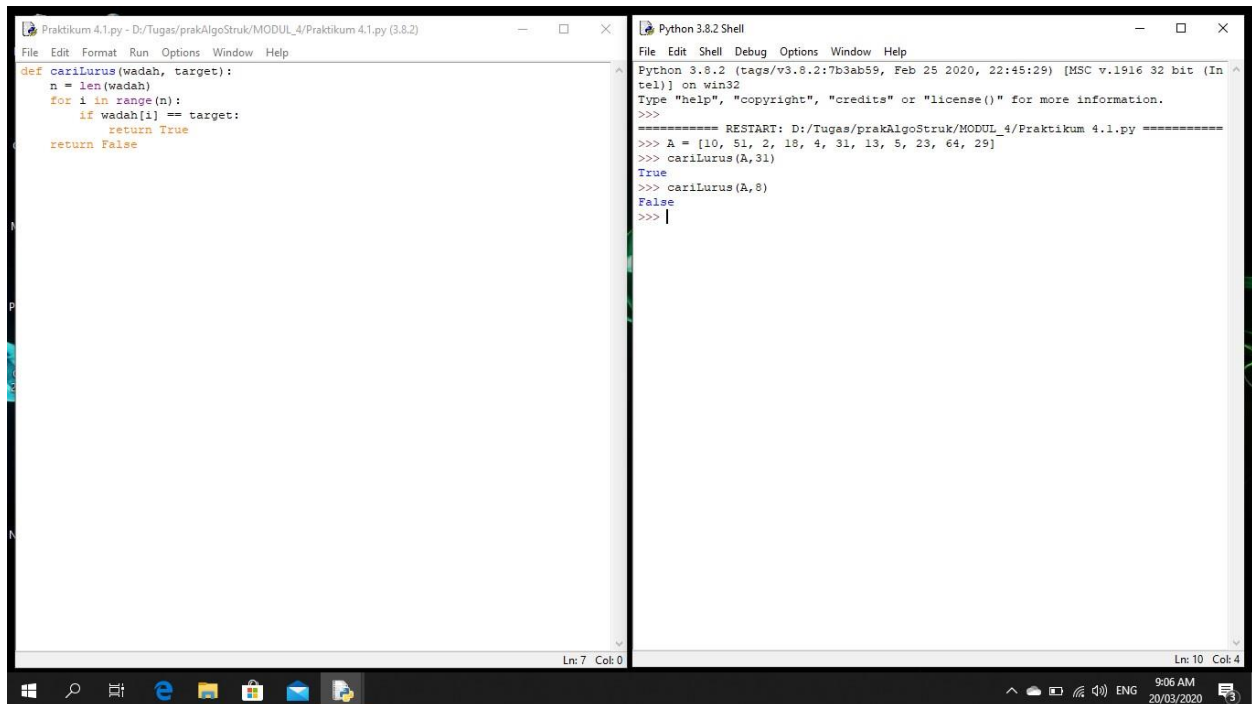
NIM : L200180007

Kelas : A

MODUL 4(PRAKTIKUM DAN TUGAS)

- Praktikum) :

4.1 Linear search

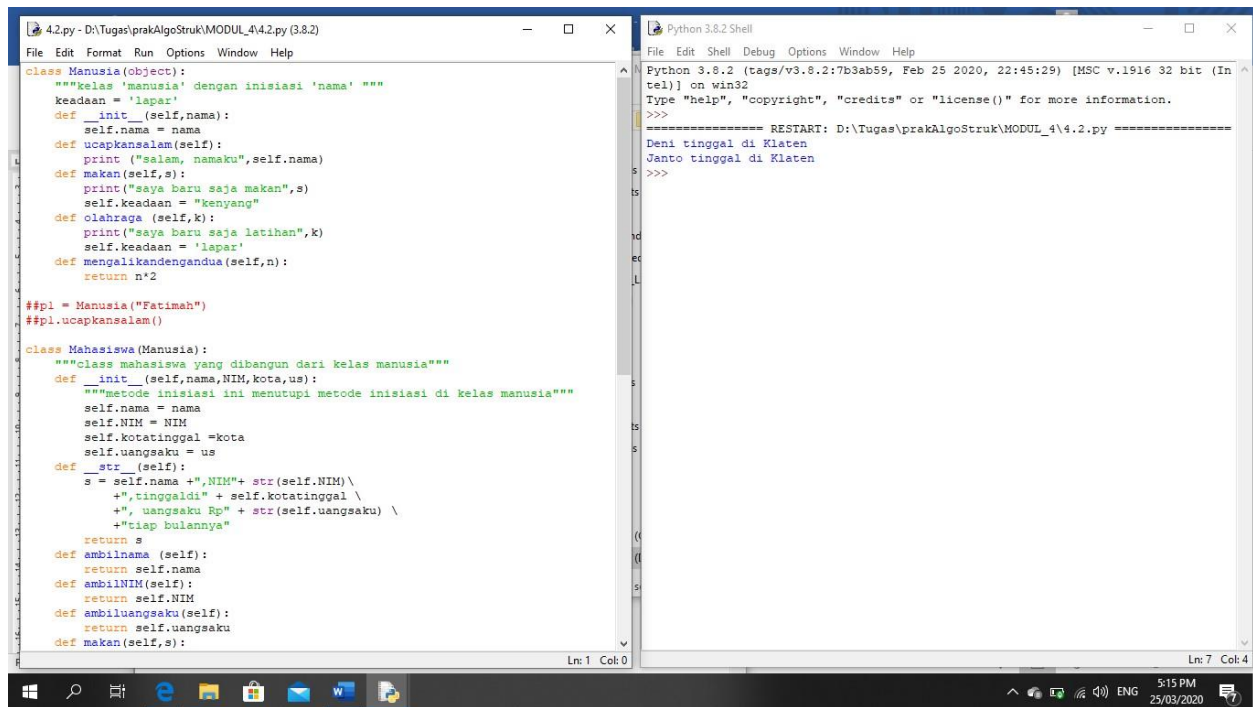


The screenshot displays a Python IDE with two windows. The left window, titled 'Praktikum 4.1.py', contains a function definition for a linear search algorithm. The right window, titled 'Python 3.8.2 Shell', shows the execution of the function with a list of numbers and a target value.

```
def cariLurus(wadah, target):  
    n = len(wadah)  
    for i in range(n):  
        if wadah[i] == target:  
            return True  
    return False
```

```
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 22:45:29) [MSC v.1916 32 bit (Intel)] on win32  
Type "help", "copyright", "credits" or "license()" for more information.  
>>>  
===== RESTART: D:/Tugas/prakAlgoStruk/MODUL_4/Praktikum 4.1.py =====  
>>> A = [10, 31, 2, 18, 4, 31, 13, 5, 23, 64, 29]  
>>> cariLurus(A, 31)  
True  
>>> cariLurus(A, 8)  
False  
>>> |
```

4.2 Pencarian lurus untuk objek membuat sendiri



The screenshot shows a Python IDE with two windows. The left window, titled '4.2.py - D:\Tugas\prakAlgoStruk\MODUL_4\4.2.py (3.8.2)', contains the following code:

```
class Manusia(object):
    """kelas 'manusia' dengan inisiasi 'nama' """
    keadaan = 'lapar'
    def __init__(self, nama):
        self.nama = nama
    def ucapkansalam(self):
        print("salam, 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 mengalikandengdua(self, n):
        return n*2

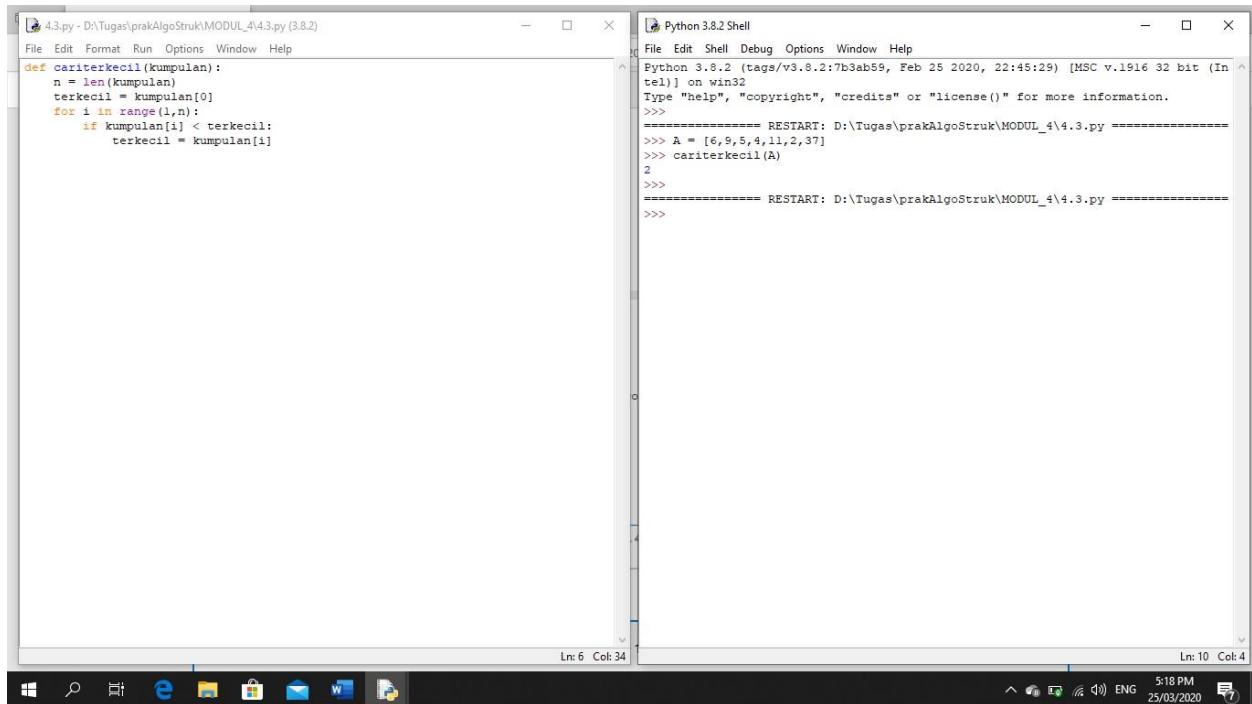
#p1 = Manusia("Fatimah")
#p1.ucapkanksalam()

class Mahasiswa(Manusia):
    """class mahasiswa yang dibangun dari kelas manusia"""
    def __init__(self, nama, NIM, kota, us):
        """metode inisiasi ini menutupi metode inisiasi di kelas manusia"""
        self.nama = nama
        self.NIM = NIM
        self.kotatinggal = kota
        self.uangaku = us
    def __str__(self):
        s = self.nama + ",NIM"+ str(self.NIM)\
            + ",tinggaldi" + self.kotatinggal \
            + ", uangaku Rp" + str(self.uangaku) \
            + "tiap bulannya"
        return s
    def ambilnama(self):
        return self.nama
    def ambilNIM(self):
        return self.NIM
    def ambiluangaku(self):
        return self.uangaku
    def makan(self, s):
```

The right window, titled 'Python 3.8.2 Shell', shows the execution output:

```
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 22:45:29) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: D:\Tugas\prakAlgoStruk\MODUL_4\4.2.py =====
Deni tinggal di Klaten
Janto tinggal di Klaten
>>>
```

4.3 Mencari nilai yang terkecil pada array yang tidak urut



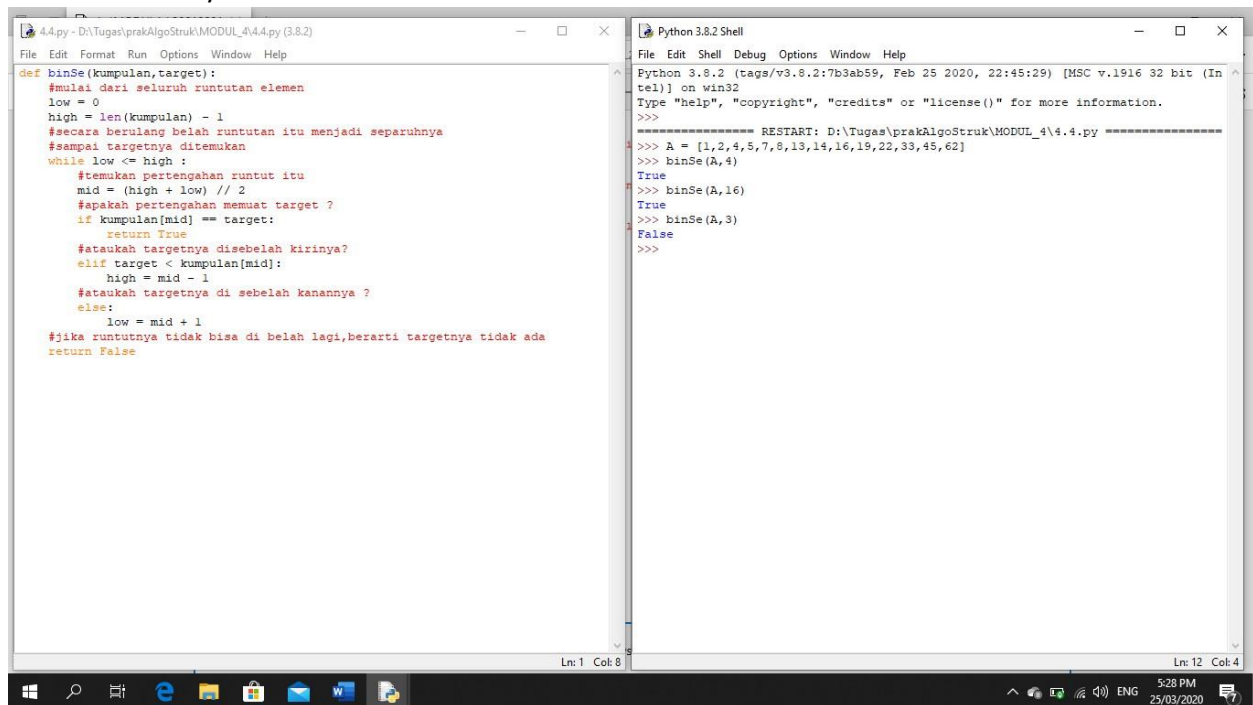
The screenshot shows a Python IDE with two windows. The left window, titled '4.3.py - D:\Tugas\prakAlgoStruk\MODUL_4\4.3.py (3.8.2)', contains the following code:

```
def cariterkecil(kumpulan):
    n = len(kumpulan)
    terkecil = kumpulan[0]
    for i in range(1, n):
        if kumpulan[i] < terkecil:
            terkecil = kumpulan[i]
```

The right window, titled 'Python 3.8.2 Shell', shows the execution output:

```
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 22:45:29) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: D:\Tugas\prakAlgoStruk\MODUL_4\4.3.py =====
>>> A = [6,9,5,4,11,2,37]
>>> cariterkecil(A)
2
>>>
===== RESTART: D:\Tugas\prakAlgoStruk\MODUL_4\4.3.py =====
>>>
```

4.4 Binary Search



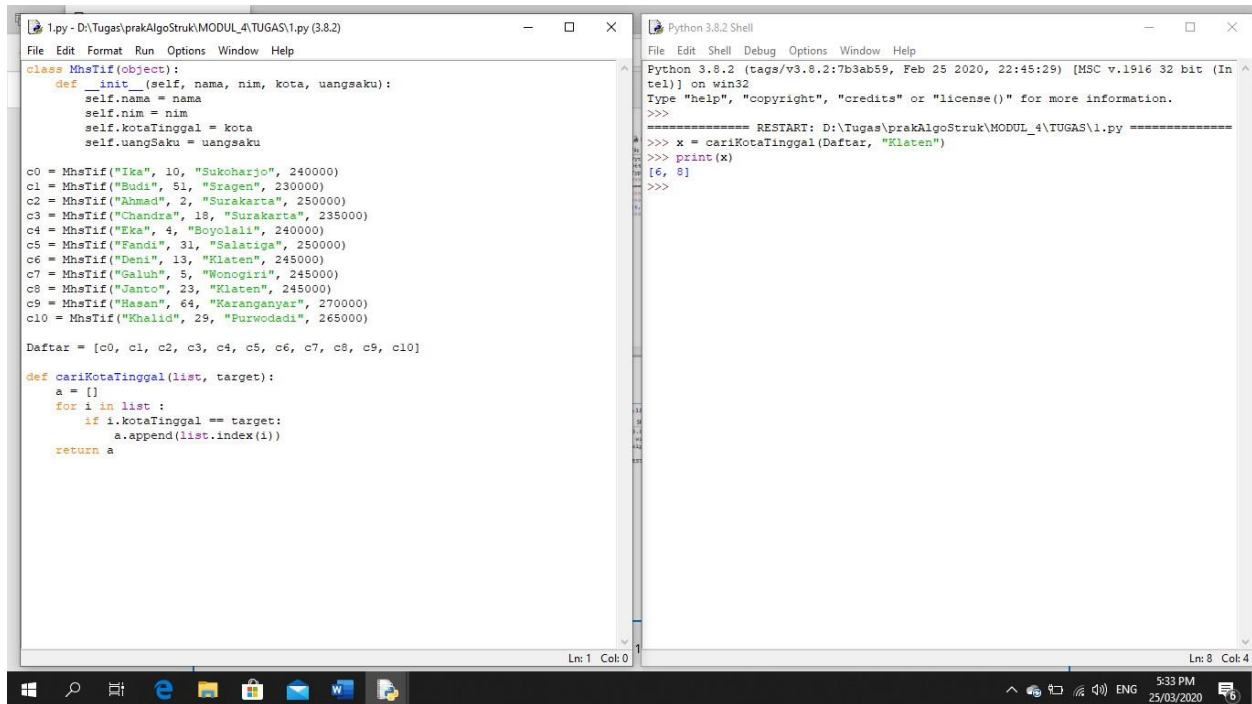
The image shows a screenshot of a Python IDE with two windows. The left window is a text editor titled '4.4.py - D:\Tugas\prakAlgoStruk\MODUL_4\4.4.py (3.8.2)'. It contains a Python function `binSe(kumpulan, target):` that implements a binary search algorithm. The function initializes `low = 0` and `high = len(kumpulan) - 1`. It enters a `while low <= high:` loop where it calculates `mid = (high + low) // 2`. If `kumpulan[mid] == target`, it returns `True`. If `target < kumpulan[mid]`, it updates `high = mid - 1`. Otherwise, it updates `low = mid + 1`. If the loop ends, it returns `False`. The right window is a 'Python 3.8.2 Shell' titled 'Python 3.8.2 Shell'. It shows the execution of the code: `A = [1,2,4,5,7,8,13,14,16,19,22,33,45,62]`, `binSe(A,4)` returns `True`, and `binSe(A,3)` returns `False`. The Windows taskbar at the bottom shows the date as 25/03/2020 and time as 5:28 PM.

```
def binSe(kumpulan, target):
    #mulai dari seluruh runtutan elemen
    low = 0
    high = len(kumpulan) - 1
    #secara berulang belah runtutan itu menjadi separuhnya
    #sampai targetnya ditemukan
    while low <= high :
        #temukan pertengahan runtut itu
        mid = (high + low) // 2
        #apakah pertengahan memuat target ?
        if kumpulan[mid] == target:
            return True
        #ataukah targetnya disebelah kirinya?
        elif target < kumpulan[mid]:
            high = mid - 1
        #ataukah targetnya di sebelah kanannya ?
        else:
            low = mid + 1
    #jika runtutnya tidak bisa di belah lagi,berarti targetnya tidak ada
    return False

Python 3.8.2 Shell
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 22:45:29) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: D:\Tugas\prakAlgoStruk\MODUL_4\4.4.py =====
>>> A = [1,2,4,5,7,8,13,14,16,19,22,33,45,62]
>>> binSe(A,4)
True
>>> binSe(A,16)
True
>>> binSe(A,3)
False
>>>
```

• Tugas :

1. Soal nomor 1



```
1.py - D:\Tugas\prakAlgoStruk\MODUL_4\TUGAS\1.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

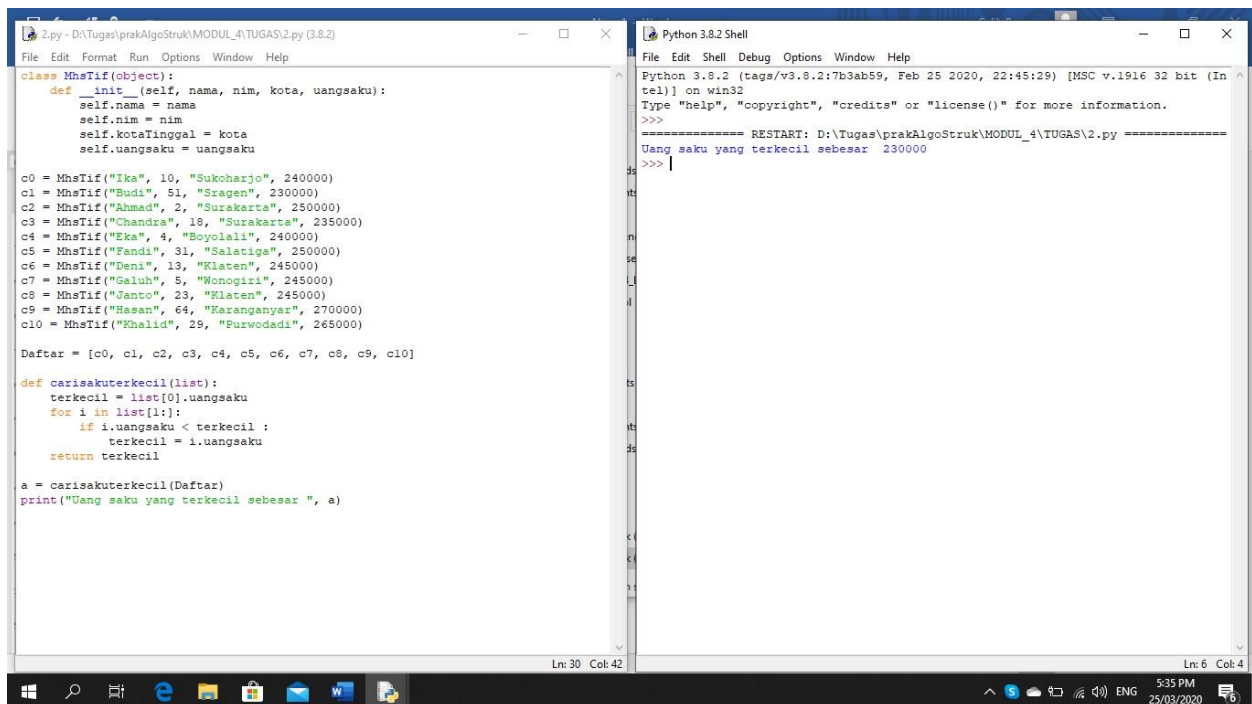
c0 = MhsTif("Ika", 10, "Sukoharjo", 240000)
c1 = MhsTif("Budi", 51, "Sragen", 230000)
c2 = MhsTif("Ahmad", 2, "Surakarta", 250000)
c3 = MhsTif("Chandra", 18, "Surakarta", 235000)
c4 = MhsTif("Eka", 4, "Boyolali", 240000)
c5 = MhsTif("Fandi", 31, "Salatiga", 250000)
c6 = MhsTif("Deni", 13, "Klaten", 245000)
c7 = MhsTif("Galuh", 5, "Wonogiri", 245000)
c8 = MhsTif("Janto", 23, "Klaten", 245000)
c9 = MhsTif("Hasan", 64, "Karanganyar", 270000)
c10 = MhsTif("Khalid", 29, "Purwodadi", 265000)

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

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
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 (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: D:\Tugas\prakAlgoStruk\MODUL_4\TUGAS\1.py =====
>>> x = cariKotaTinggal(Daftar, "Klaten")
>>> print(x)
[6, 8]
>>>
```

2. Soal nomor 2



```
2.py - D:\Tugas\prakAlgoStruk\MODUL_4\TUGAS\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("Ika", 10, "Sukoharjo", 240000)
c1 = MhsTif("Budi", 51, "Sragen", 230000)
c2 = MhsTif("Ahmad", 2, "Surakarta", 250000)
c3 = MhsTif("Chandra", 18, "Surakarta", 235000)
c4 = MhsTif("Eka", 4, "Boyolali", 240000)
c5 = MhsTif("Fandi", 31, "Salatiga", 250000)
c6 = MhsTif("Deni", 13, "Klaten", 245000)
c7 = MhsTif("Galuh", 5, "Wonogiri", 245000)
c8 = MhsTif("Janto", 23, "Klaten", 245000)
c9 = MhsTif("Hasan", 64, "Karanganyar", 270000)
c10 = MhsTif("Khalid", 29, "Purwodadi", 265000)

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

def carisakuterkecil(list):
    terkecil = list[0].uangaku
    for i in list[1:]:
        if i.uangsaku < terkecil:
            terkecil = i.uangsaku
    return terkecil

a = carisakuterkecil(Daftar)
print("Uang saku yang terkecil sebesar ", a)

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 (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: D:\Tugas\prakAlgoStruk\MODUL_4\TUGAS\2.py =====
>>>
Uang saku yang terkecil sebesar 230000
>>>
```

Soal

3. nomor 3

```
3.py - D:\Tugas\prakAlgoStruk\MODUL_4\TUGAS\3.py (3.8.2)
File Edit Format Run Options Window Help

def __init__(self, nama, nim, kota, uangsaku):
    self.nama = nama
    self.nim = nim
    self.kotaTinggal = kota
    self.uangSaku = uangsaku

class buatArray(object):
    internalData = 11 * [None]

    def __getitem__(self, item):
        return self.internalData[item]

    def __setitem__(self, key, value):
        self.internalData[key] = value

    def siapaTermiskin(self):
        terkecil = self[0].uangSaku
        d = []
        for i in self:
            if i.uangSaku <= terkecil:
                terkecil = i.uangSaku
        for i in self:
            if terkecil == i.uangSaku:
                d.append((i.nama, i.nim, i.kotaTinggal, i.uangSaku))
        return d

c = buatArray()
c[0] = MhsTif("Ika", 10, "Sukoharjo", 240000)
c[1] = MhsTif("Budi", 51, "Sragen", 230000)
c[2] = MhsTif("Ahmad", 2, "Surakarta", 250000)
c[3] = MhsTif("Chandra", 18, "Surakarta", 235000)
c[4] = MhsTif("Eka", 4, "Boyolali", 240000)
c[5] = MhsTif("Fandi", 31, "Salatiga", 250000)
c[6] = MhsTif("Deni", 13, "Klaten", 245000)
c[7] = MhsTif("Galuh", 5, "Wonogiri", 245000)
c[8] = MhsTif("Janto", 23, "Klaten", 245000)
c[9] = MhsTif("Hasan", 64, "Karanganyar", 270000)
c[10] = MhsTif("Khalid", 29, "Purwodadi", 265000)

Ln:33 Col:49
```

```
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 (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: D:\Tugas\prakAlgoStruk\MODUL_4\TUGAS\3.py =====
>>> c.siapaTermiskin()
[('Budi', 51, 'Sragen', 230000)]
>>>
```

4. Soal nomor 4

```
4.py - D:\Tugas\prakAlgoStruk\MODUL_4\TUGAS\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("Ika", 10, "Sukoharjo", 240000)
c1 = MhsTif("Budi", 51, "Sragen", 230000)
c2 = MhsTif("Ahmad", 2, "Surakarta", 250000)
c3 = MhsTif("Chandra", 18, "Surakarta", 235000)
c4 = MhsTif("Eka", 4, "Boyolali", 240000)
c5 = MhsTif("Fandi", 31, "Salatiga", 250000)
c6 = MhsTif("Deni", 13, "Klaten", 245000)
c7 = MhsTif("Galuh", 5, "Wonogiri", 245000)
c8 = MhsTif("Janto", 23, "Klaten", 245000)
c9 = MhsTif("Hasan", 64, "Karanganyar", 270000)
c10 = MhsTif("Khalid", 29, "Purwodadi", 265000)

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

def cari(list):
    temp = []
    for i in list:
        if i.uangSaku < 250000:
            temp.append(i)
    return temp

a = cari(Daftar)
for i in a:
    print(i.nama)

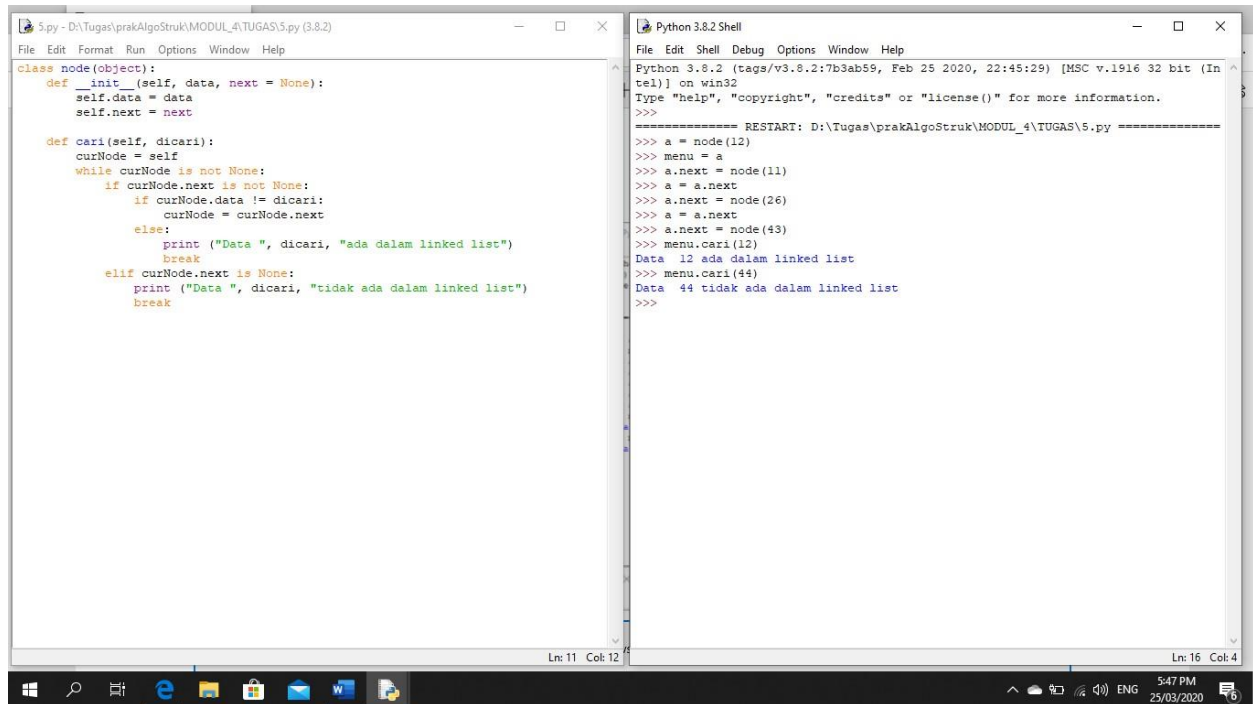
Ln:29 Col:8
```

```
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 (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: D:\Tugas\prakAlgoStruk\MODUL_4\TUGAS\4.py =====
>>>
Ika
Budi
Chandra
Eka
Deni
Galuh
Janto
>>>
```

Soal

5. nomor 5



The screenshot shows a Python IDE with two windows. The left window, titled '5.py - D:\Tugas\prakAlgoStruk\MODUL_4\TUGAS\5.py (3.8.2)', contains the following code:

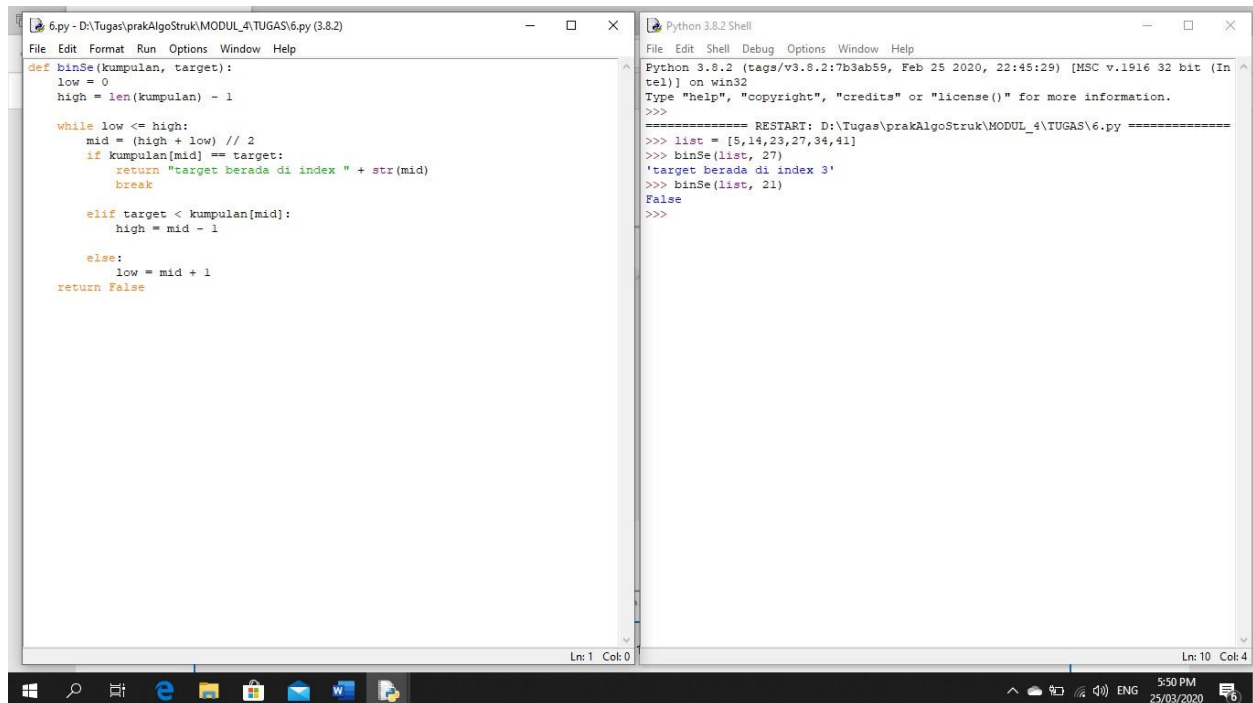
```
class node(object):
    def __init__(self, data, next = None):
        self.data = data
        self.next = next

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

The right window, titled 'Python 3.8.2 Shell', shows the execution of the code:

```
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 22:45:29) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: D:\Tugas\prakAlgoStruk\MODUL_4\TUGAS\5.py =====
>>> a = node(12)
>>> menu = a
>>> a.next = node(11)
>>> a = a.next
>>> a.next = node(26)
>>> a = a.next
>>> a.next = node(43)
>>> menu.cari(12)
Data 12 ada dalam linked list
>>> menu.cari(44)
Data 44 tidak ada dalam linked list
>>>
```

6. Soal nomor 6



The screenshot shows a Python IDE with two windows. The left window, titled '6.py - D:\Tugas\prakAlgoStruk\MODUL_4\TUGAS\6.py (3.8.2)', contains the following code:

```
def binSe(kumpulan, target):
    low = 0
    high = len(kumpulan) - 1

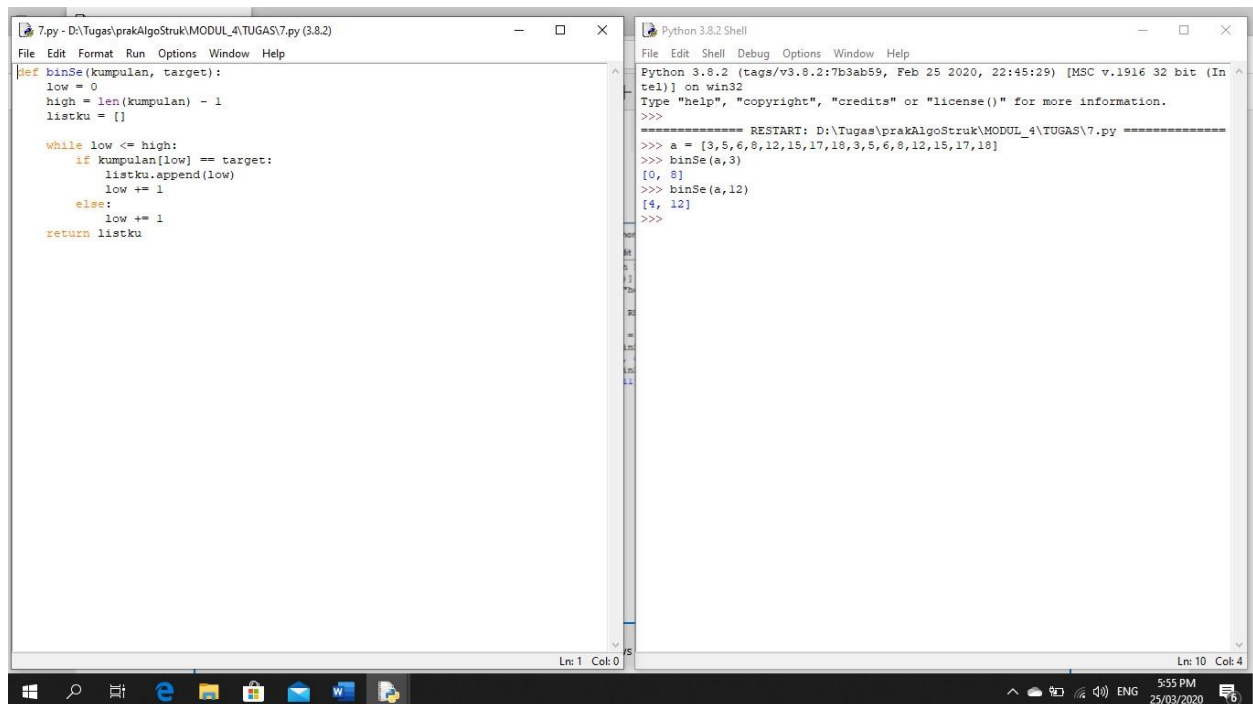
    while low <= high:
        mid = (high + low) // 2
        if kumpulan[mid] == target:
            return "target berada di index " + str(mid)
            break
        elif target < kumpulan[mid]:
            high = mid - 1
        else:
            low = mid + 1
    return False
```

The right window, titled 'Python 3.8.2 Shell', shows the execution of the code:

```
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 22:45:29) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: D:\Tugas\prakAlgoStruk\MODUL_4\TUGAS\6.py =====
>>> list = [5,14,23,27,34,41]
>>> binSe(list, 27)
'target berada di index 3'
>>> binSe(list, 21)
False
>>>
```

Soal

7. nomor 7



The screenshot shows a Python IDE with two windows. The left window, titled '7.py - D:\Tugas\prakAlgoStruk\MODUL_4\TUGAS\7.py (3.8.2)', contains the following code:

```
def binSe(kumpulan, target):
    low = 0
    high = len(kumpulan) - 1
    listku = []

    while low <= high:
        if kumpulan[low] == target:
            listku.append(low)
            low += 1
        else:
            low += 1
    return listku
```

The right window, titled 'Python 3.8.2 Shell', shows the execution of the function:

```
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 22:45:29) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: D:\Tugas\prakAlgoStruk\MODUL_4\TUGAS\7.py =====
>>> a = [3,5,6,8,12,15,17,18,3,5,6,8,12,15,17,18]
>>> binSe(a,3)
[0, 8]
>>> binSe(a,12)
[4, 12]
>>>
```

8. Soal : Pada permainan tebak angka, 1-100 dibutuhkan maksimal 7 kali tebakan untuk menemukan angka yang TEPAT. untuk angka 1-1000 dibutuhkan maksimal 10 kali tebakan. Mengapa demikian? Bagaimana polanya

Jawaban : Ada dua kemungkinan pola yang bisa digunakan.

Misalkan, angka yang akan ditebak adalah 70.

-POLA PERTAMA-

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

Soal

(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

-POLA KEDUA- menggunakan barisan

geometri $S_n = 2^n$ 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"