PRAKTIKUM
ALGORITMA DAN STRUKTUR DATA
(Algorithm and Data Structure)

LAPORAN TUGAS
MODUL 4

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PROGRAM STUDI INFORMATIKA

FAKULTAS KOMUNIKASI DAN INFORMATIKA

UNIVERSITAS MUHAMMADIYAH

SURAKARTA

Latihan 4.1

Latihan.py - D:/universitas/kuliah/prakASD/modul4/Latihan.py (3.9.0)

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

Python 3.9.0 Shell

File Edit Shell Debug Options Window Help

```
Python 3.9.0 (tags/v3.9.0:9cf6752, Oct  5 2020, 15:34:40) [MSC v.1927 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: D:/universitas/kuliah/prakASD/modul4/Latihan.py ==========
>>> A = [10,51,2,18,4,31,13,5,23,64,29]
>>> cariLurus(A,31)
True
>>> cariLurus(A,8)
False
>>>
>>>
```

Latihan 4.2

lat2.py - D:\universitas\kuliah\prakASD\modul4\lat2.py (3.9.0)

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```
class MhsTIF(object): # perhatikan class induknya: Mahasiswa
    """Class MhsTIF yang dibangun dari class Mahasiswa"""
    def __init__(self,nama,NIM,kota,us):
        """Metode inisiasi ini menutupi metode inisiasi di class Manusia."""
        self.nama = nama
        self.NIM = NIM
        self.kotaTinggal = kota
        self.uangSaku = us

c0 = MhsTIF("Ika", 10, "Sukoharjo", 240000)
c1 = MhsTIF("Budi", 51, "Sragen", 230000)
c2 = MhsTIF("Ahmad", 2, "Surakarta", 250000)
c3 = MhsTIF("Chandra", 18, "Sukoharjo", 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]

target = "Klaten"
for i in Daftar:
    if i.kotaTinggal == target:
        print(i.nama +" tinggal di "+target)
```

Python 3.9.0 Shell

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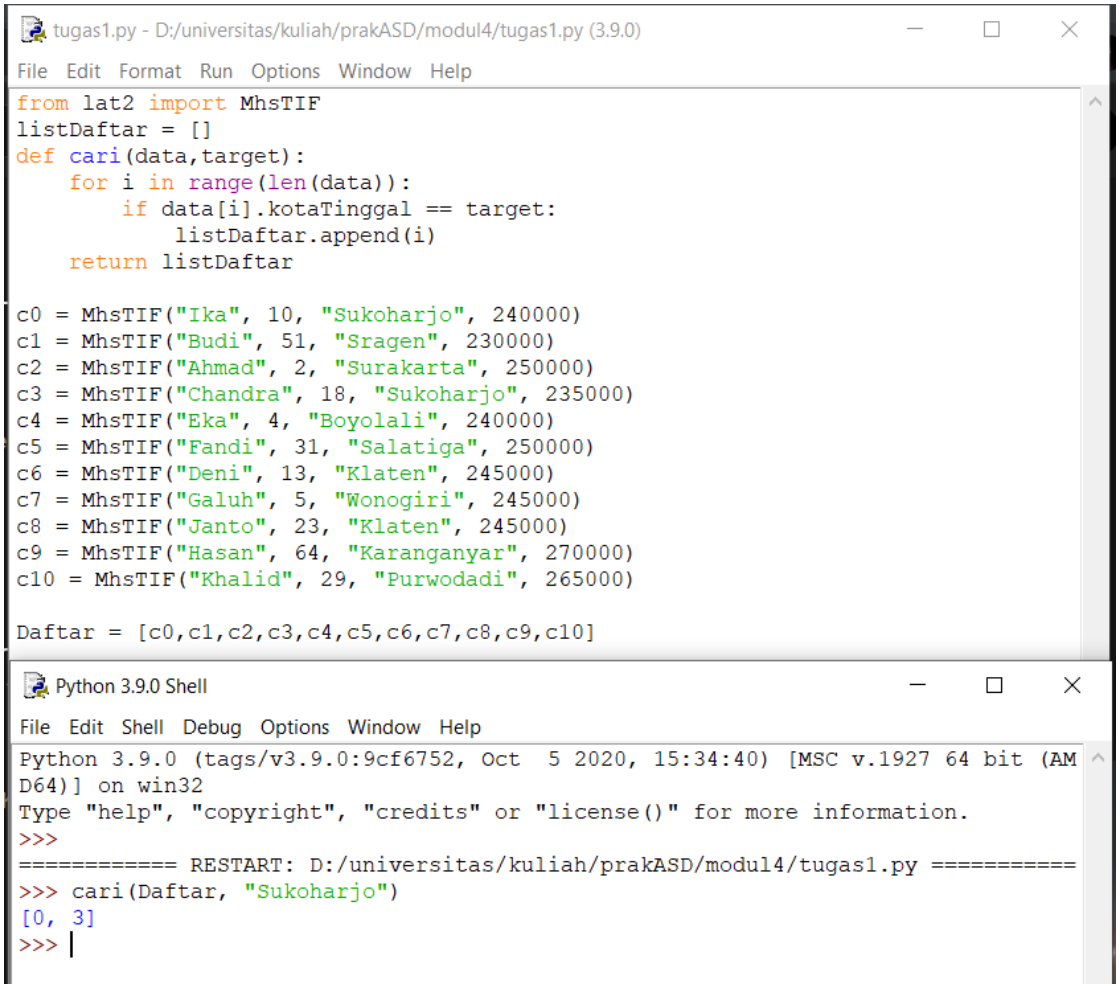
```
Python 3.9.0 (tags/v3.9.0:9cf6752, Oct  5 2020, 15:34:40) [MSC v.1927 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
============= RESTART: D:\universitas\kuliah\prakASD\modul4\lat2.py ============
Deni tinggal di Klaten
Janto tinggal di Klaten
>>>
```

Tugas 1



tugas1.py - D:/universitas/kuliah/prakASD/modul4/tugas1.py (3.9.0)

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```
from lat2 import MhsTIF
listDaftar = []
def cari(data,target):
    for i in range(len(data)):
        if data[i].kotaTinggal == target:
            listDaftar.append(i)
    return listDaftar

c0 = MhsTIF("Ika", 10, "Sukoharjo", 240000)
c1 = MhsTIF("Budi", 51, "Sragen", 230000)
c2 = MhsTIF("Ahmad", 2, "Surakarta", 250000)
c3 = MhsTIF("Chandra", 18, "Sukoharjo", 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]
```

Python 3.9.0 Shell

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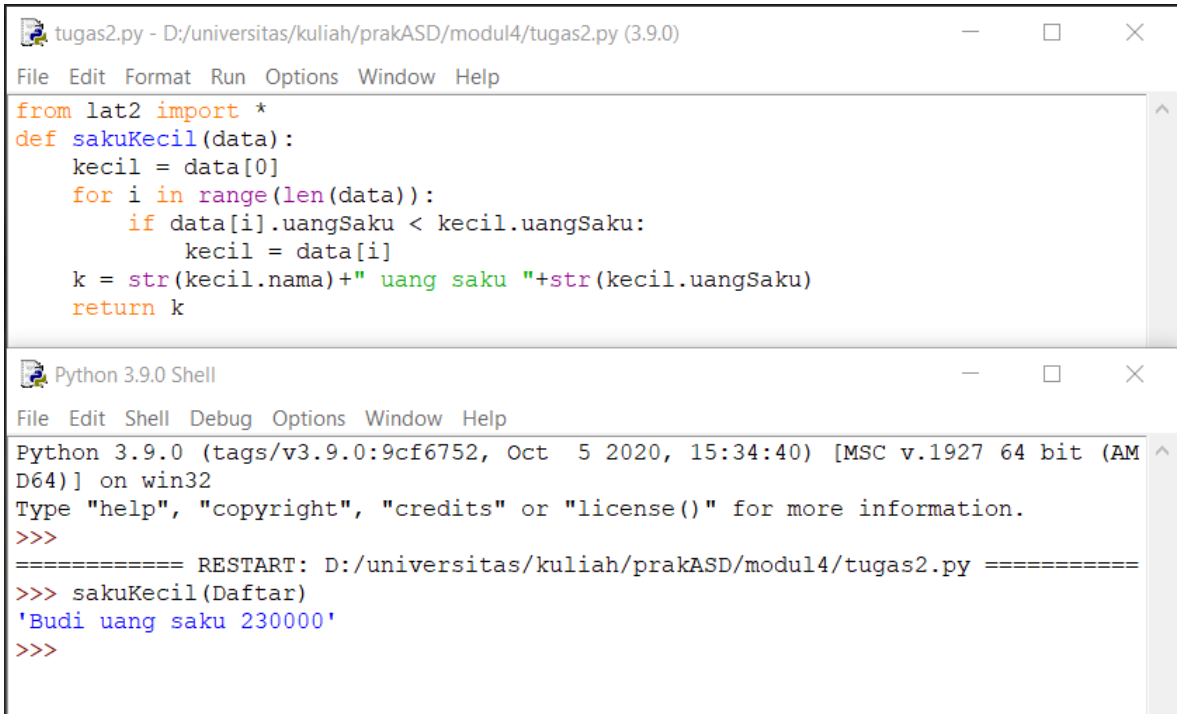
```
Python 3.9.0 (tags/v3.9.0:9cf6752, Oct  5 2020, 15:34:40) [MSC v.1927 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: D:/universitas/kuliah/prakASD/modul4/tugas1.py ==========
>>> cari(Daftar, "Sukoharjo")
[0, 3]
>>>
```

Tugas 2



tugas2.py - D:/universitas/kuliah/prakASD/modul4/tugas2.py (3.9.0)

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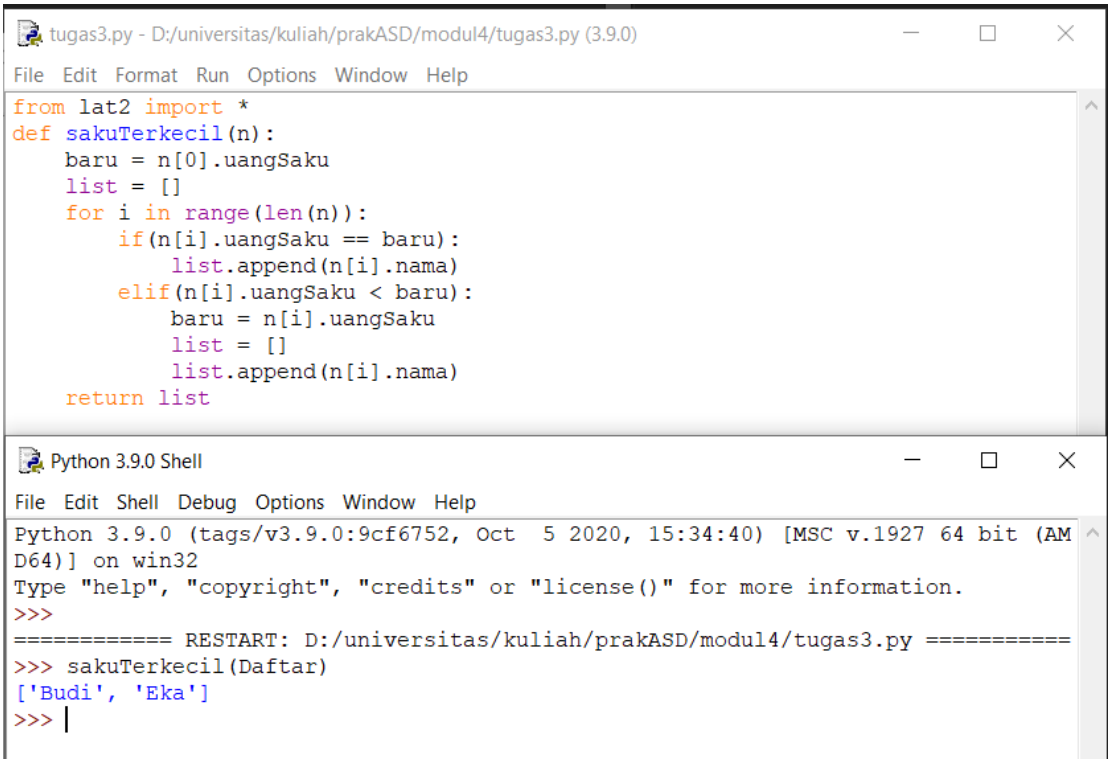
```
from lat2 import *
def sakuKecil(data):
    kecil = data[0]
    for i in range(len(data)):
        if data[i].uangSaku < kecil.uangSaku:
            kecil = data[i]
    k = str(kecil.nama)+" uang saku "+str(kecil.uangSaku)
    return k
```

Python 3.9.0 Shell

File Edit Shell Debug Options Window Help

```
Python 3.9.0 (tags/v3.9.0:9cf6752, Oct  5 2020, 15:34:40) [MSC v.1927 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: D:/universitas/kuliah/prakASD/modul4/tugas2.py ==========
>>> sakuKecil(Daftar)
'Budi uang saku 230000'
>>>
```

Tugas 3



tugas3.py - D:/universitas/kuliah/prakASD/modul4/tugas3.py (3.9.0)

File Edit Format Run Options Window Help

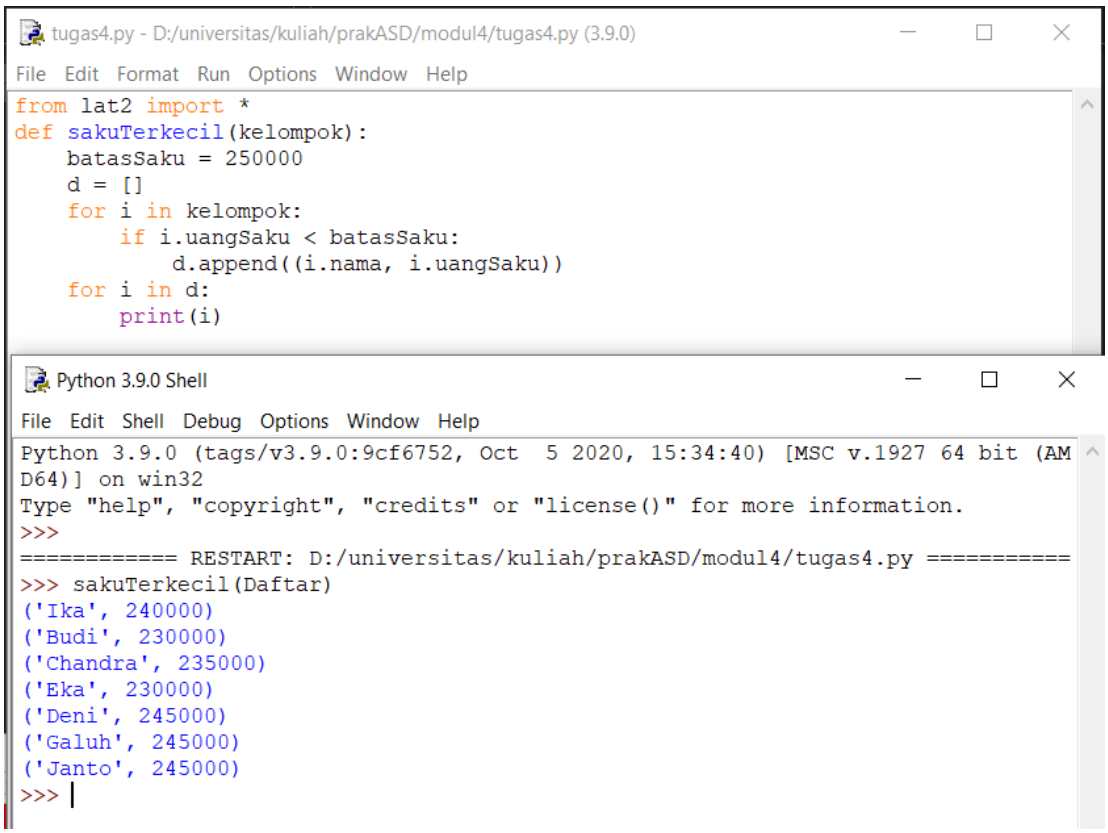
```
from lat2 import *
def sakuTerkecil(n):
    baru = n[0].uangSaku
    list = []
    for i in range(len(n)):
        if(n[i].uangSaku == baru):
            list.append(n[i].nama)
        elif(n[i].uangSaku < baru):
            baru = n[i].uangSaku
            list = []
            list.append(n[i].nama)
    return list
```

Python 3.9.0 Shell

File Edit Shell Debug Options Window Help

```
Python 3.9.0 (tags/v3.9.0:9cf6752, Oct  5 2020, 15:34:40) [MSC v.1927 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
============ RESTART: D:/universitas/kuliah/prakASD/modul4/tugas3.py ===========
>>> sakuTerkecil(Daftar)
['Budi', 'Eka']
>>>
```

Tugas 4



tugas4.py - D:/universitas/kuliah/prakASD/modul4/tugas4.py (3.9.0)

File Edit Format Run Options Window Help

```
from lat2 import *
def sakuTerkecil(kelompok):
    batasSaku = 250000
    d = []
    for i in kelompok:
        if i.uangSaku < batasSaku:
            d.append((i.nama, i.uangSaku))
    for i in d:
        print(i)
```

Python 3.9.0 Shell

File Edit Shell Debug Options Window Help

```
Python 3.9.0 (tags/v3.9.0:9cf6752, Oct  5 2020, 15:34:40) [MSC v.1927 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
============ RESTART: D:/universitas/kuliah/prakASD/modul4/tugas4.py ===========
>>> sakuTerkecil(Daftar)
('Ika', 240000)
('Budi', 230000)
('Chandra', 235000)
('Eka', 230000)
('Deni', 245000)
('Galuh', 245000)
('Janto', 245000)
>>>
```

Tugas 5

tugas5.py - D:/universitas/kuliah/prakASD/modul4/tugas5.py (3.9.0)

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```
class Link(object):
    def __init__(self, nama, next=None):
        self.data = nama
        self.next = next
def cari(x,y):
    if y ==1:
        print(x.data)
    elif y ==2:
        print(x.next.data)
    elif y ==3:
        print(x.next.next.data)
    elif y ==4:
        print(x.next.next.next.data)
    else:
        print("invalid data")

a = Link(12)
b = Link(23)
c = Link(65)
d = Link(11)
a.next = b
b.next = c
c.next = d
print("Head adalah a, cari(a,(urutan data yang dicari))")
```

Python 3.9.0 Shell

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```
Python 3.9.0 (tags/v3.9.0:9cf6752, Oct  5 2020, 15:34:40) [MSC v.1927 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: D:/universitas/kuliah/prakASD/modul4/tugas5.py ==========
Head adalah a, cari(a,(urutan data yang dicari))
>>> cari(a,4)
11
>>> cari(a,2)
23
>>> cari(a,3)
65
>>> cari(a,1)
12
>>>
>>>
```

Tugas 6

tugas6.py - D:/universitas/kuliah/prakASD/modul4/tugas6.py (3.9.0)

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```
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 "target tidak ada dalam index"
listnya = [16, 27, 38, 49, 55, 78, 67]
target1 = 67
target2 = 6969
print ("\nListnya :", listnya)
print ("Nilai targetnya", target1)
print (binSe(listnya, target1))
print ("\nListnya :", listnya)
print ("Nilai targetnya", target2)
print (binSe(listnya, target2))
```

Python 3.9.0 Shell

File Edit Shell Debug Options Window Help

```
Python 3.9.0 (tags/v3.9.0:9cf6752, Oct  5 2020, 15:34:40) [MSC v.1927 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: D:/universitas/kuliah/prakASD/modul4/tugas6.py ==========

Listnya : [16, 27, 38, 49, 55, 78, 67]
Nilai targetnya 67
target tidak ada dalam index

Listnya : [16, 27, 38, 49, 55, 78, 67]
Nilai targetnya 6969
target tidak ada dalam index
>>>
```

Tugas 7

tugas7.py - D:/universitas/kuliah/prakASD/modul4/tugas7.py (3.9.0)

File Edit Format Run Options Window Help

```
def binSearch(kumpulan, target):
    low = 0
    high = len(kumpulan) - 1
    data = []
    while low != high:
        mid = (high + low) // 2
        if kumpulan[mid] == target:
            break
        elif target < kumpulan[mid]:
            high = mid - 1
        else:
            low = mid + 1
    for i in range(low, high):
        if target == kumpulan[i]:
            data.append(i)
    return data

a = [2,3,5,6,6,6,8,9,9,10,11,12,13,13,14]
```

Python 3.9.0 Shell

File Edit Shell Debug Options Window Help

```
Python 3.9.0 (tags/v3.9.0:9cf6752, Oct  5 2020, 15:34:40) [MSC v.1927 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: D:/universitas/kuliah/prakASD/modul4/tugas7.py ==========
>>> binSearch(a,6)
[3, 4, 5]
>>> binSearch(a,10)
[9]
>>>
```

Tugas 8

tugas8.py - D:/universitas/kuliah/prakASD/modul4/tugas8.py (3.9.0)

File Edit Format Run Options Window Help

```
"""
Karena 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 berasa
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!!

 """
```