PRAKTIKUM ALGORITMA DAN STRUKTUR DATA

MODUL 4

Pencarian

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PROGRAM STUDI TEKNIK INFORMATIKA

FAKULTAS KOMUNIKASI DAN INFORMATIKA

UNIVERSITAS MUHAMMADIYAH SURAKARTA

2023

I. Percobaan

Modul 4.py

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```python

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

A = [10, 51, 2, 18, 4, 31, 13, 5, 23, 64, 29]
print(cariLurus(A, 31))
print(cariLurus(A, 8))
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE Python Debug Console

```
Windows PowerShell
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PS E:\Kuliah\Semester 4\Praktikum ASD\Modul 4>  & 'C:\Users\Asus\AppData\Local\Microsoft\WindowsApps\python3.10.exe' 'c:\Users\Asus\.vscode\extensions\ms-python.python-2023.4.1\pythonFiles\lib\python\debugpy\adapter/../..\debugpy\launcher' '54679' '--' 'E:\Kuliah\Semester 4\Praktikum ASD\Modul 4\Modul 4.py'
True
False
PS E:\Kuliah\Semester 4\Praktikum ASD\Modul 4>
```

Modul 4.py

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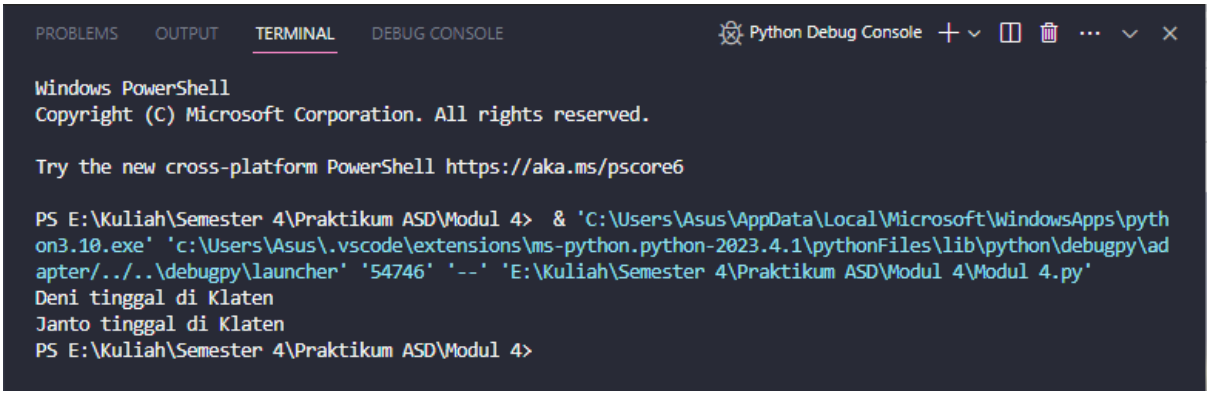
```python
class mhsTIF ():
    def __init__(self,x,y,z,v):
        self.nama = x
        self.umur = y
        self.kotaTinggal = z
        self.UangSaku = v

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]

target = 'Klaten'
for i in daftar:
    if i.kotaTinggal == target:
        print(i.nama + ' tinggal di ' + target)
```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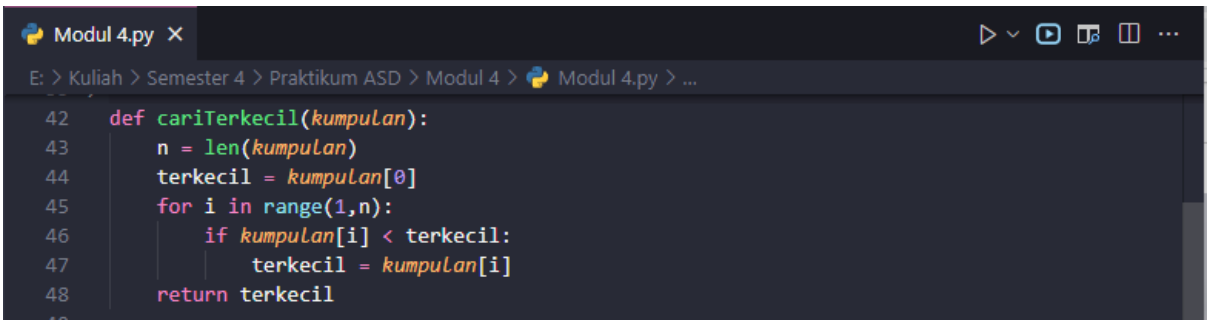
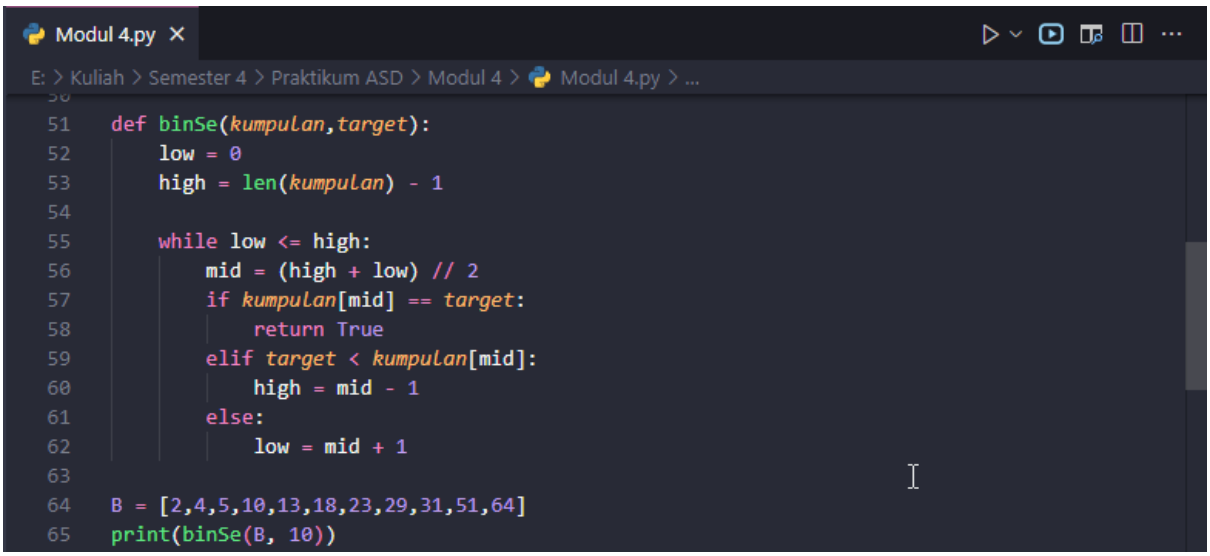
Deni tinggal di Klaten
Janto tinggal di Klaten
PS E:\Kuliah\Semester 4\Praktikum ASD\Modul 4>


Modul 4.py
E: > Kuliah > Semester 4 > Praktikum ASD > Modul 4 > Modul 4.py > ...
42 def cariTerkecil(kumpulan):
43 n = len(kumpulan)
44 terkecil = kumpulan[0]
45 for i in range(1,n):
46 if kumpulan[i] < terkecil:
47 terkecil = kumpulan[i]
48 return terkecil


Modul 4.py
E: > Kuliah > Semester 4 > Praktikum ASD > Modul 4 > Modul 4.py > ...
51 def binSe(kumpulan,target):
52 low = 0
53 high = len(kumpulan) - 1
54
55 while low <= high:
56 mid = (high + low) // 2
57 if kumpulan[mid] == target:
58 return True
59 elif target < kumpulan[mid]:
60 high = mid - 1
61 else:
62 low = mid + 1
63
64 B = [2,4,5,10,13,18,23,29,31,51,64]
65 print(binSe(B, 10))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True
PS E:\Kuliah\Semester 4\Praktikum ASD\Modul 4>

II. Soal-soal untuk mahasiswa

1. Buatlah suatu fungsi pencarian yang, alih-alih mengembalikan True/False, mengembalikan semua index lokasi elemen yang dicari. Jadi, misal pada list daftar mahasiswa di halaman 40 kita mencari mahasiswa yang berasal dari Klaten, kita akan mendapatkan [6, 8]. Kalau yang dicari tidak ditemukan, fungsi ini akan mengembalikan list kosong.

Modul 4.py

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```
67  #### Soal Nomor 1 ####
68  def pencarian(target):
69      count = 0
70      blank_List = []
71
72      for i in daftar:
73          if i.kotaTinggal == target:
74              blank_List.append(count)
75          count += 1
76
77      if len(blank_List):
78          print(blank_List)
79      else:
80          print('Tidak ditemukan')
81
82  print(pencarian('Klaten'))
83
```

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```
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[6, 8]
None
PS E:\Kuliah\Semester 4\Praktikum ASD\Modul 4>
```

2. Dari list daftar mahasiswa di atas, buatlah fungsi untuk menemukan uang saku yang terkecil di antara mereka.

3. Ubah program di atas agar mengembalikan objek mahasiswa yang mempunyai uang saku terkecil. Jika ada lebih dari satu mahasiswa yang uang sakunya terkecil, semua objek mahasiswa itu dikembalikan.

Modul 4.py

E: > Kuliah > Semester 4 > Praktikum ASD > Modul 4 > Modul 4.py > kembali_uangSaku

```
98  #### Soal Nomor 3 ####
99  def uangTerkecil(data):
100     terkecil = data[0]
101     blank_List = []
102     for i in range(len(data)):
103         if data[i].UangSaku < terkecil.UangSaku:
104             terkecil = data[i]
105             blank_List.append(data[i])
106         elif data[i].UangSaku == terkecil.UangSaku and data[i] not in blank_List and i!=0:
107             blank_List.append(data[i])
108     for i in blank_List:
109         print(str(i.nama)+" uang saku "+str(i.UangSaku))
110     return
111 print(uangTerkecil(daftar))
```

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```
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Budi uang saku 230000
None
PS E:\Kuliah\Semester 4\Praktikum ASD\Modul 4>
```
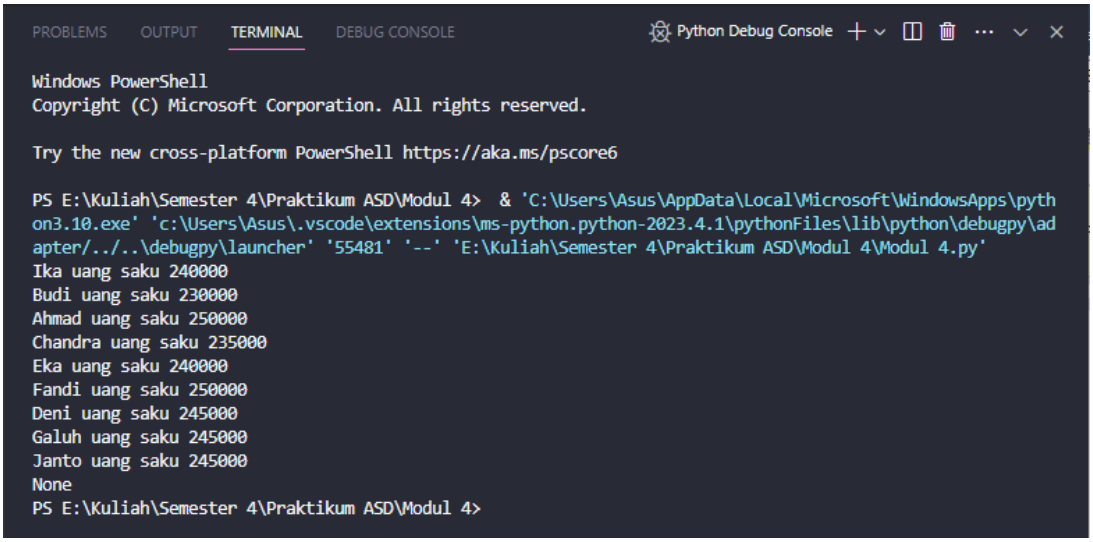
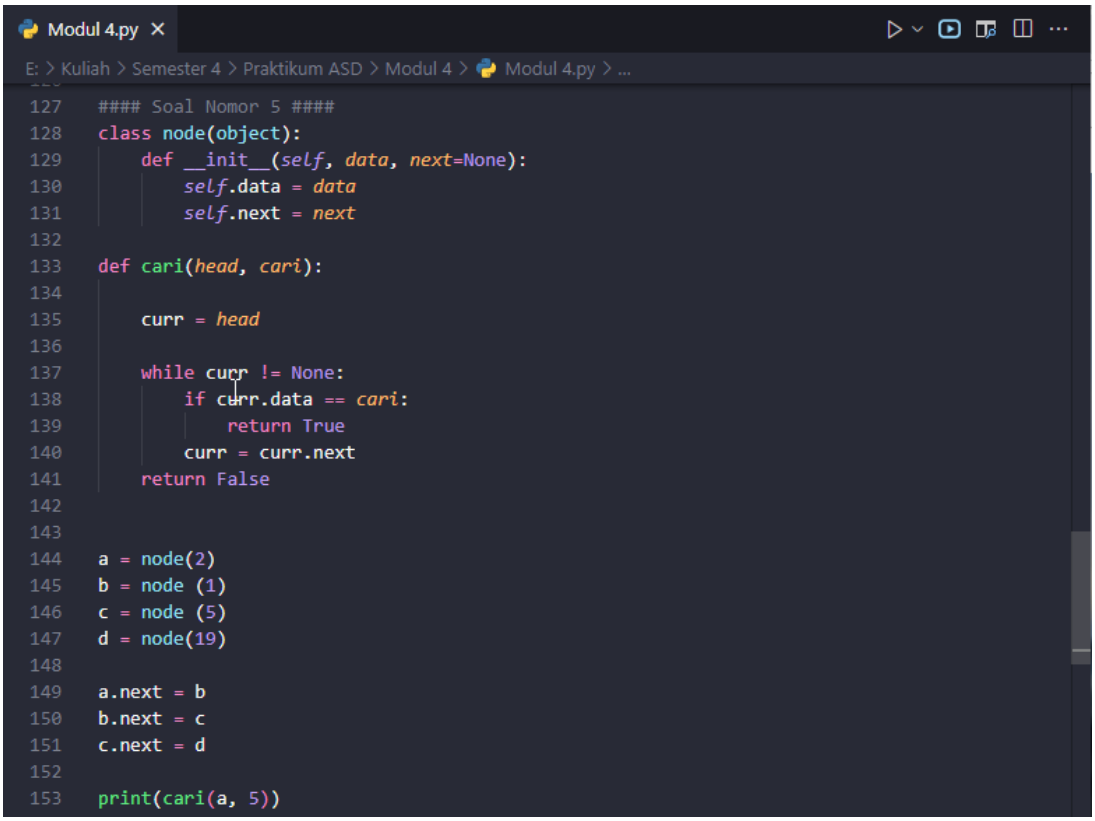

4. Buatlah suatu fungsi yang mengembalikan semua objek mahasiswa yang uang sakunya kurang dari 250000.



5. Buatlah suatu program untuk mencari suatu item di sebuah linked list.



```
Modul 4.py
E: > Kuliah > Semester 4 > Praktikum ASD > Modul 4 > Modul 4.py > ...
127  #### Soal Nomor 5 ####
128  class node(object):
129      def __init__(self, data, next=None):
130          self.data = data
131          self.next = next
132
133  def cari(head, cari):
134
135      curr = head
136
137      while curr != None:
138          if curr.data == cari:
139              return True
140          curr = curr.next
141      return False
142
143
144  a = node(2)
145  b = node (1)
146  c = node (5)
147  d = node(19)
148
149  a.next = b
150  b.next = c
151  c.next = d
152
153  print(cari(a, 5))
```

```
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True
PS E:\Kuliah\Semester 4\Praktikum ASD\Modul 4>
```
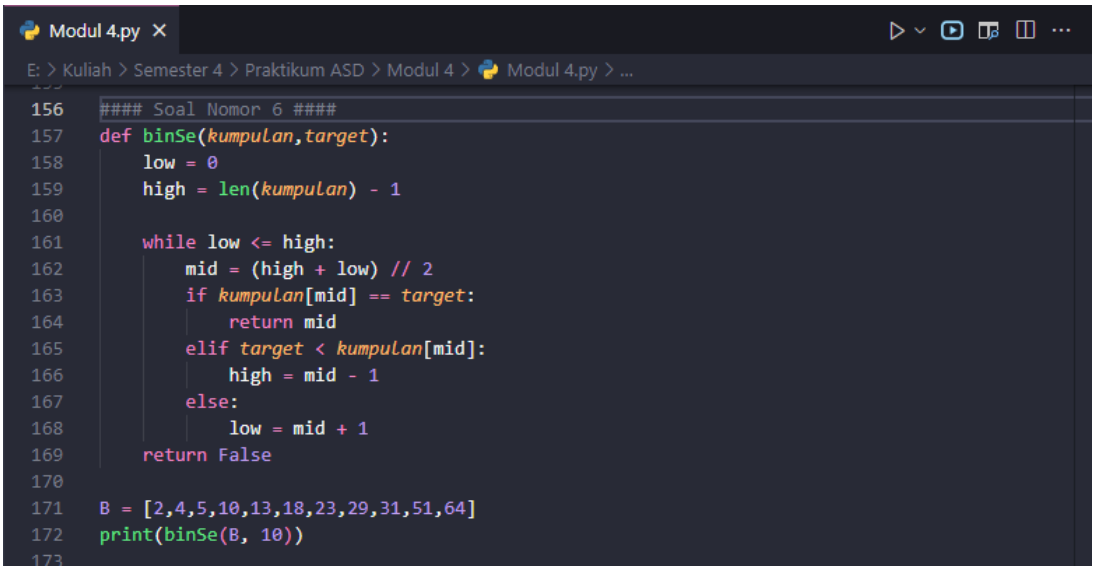
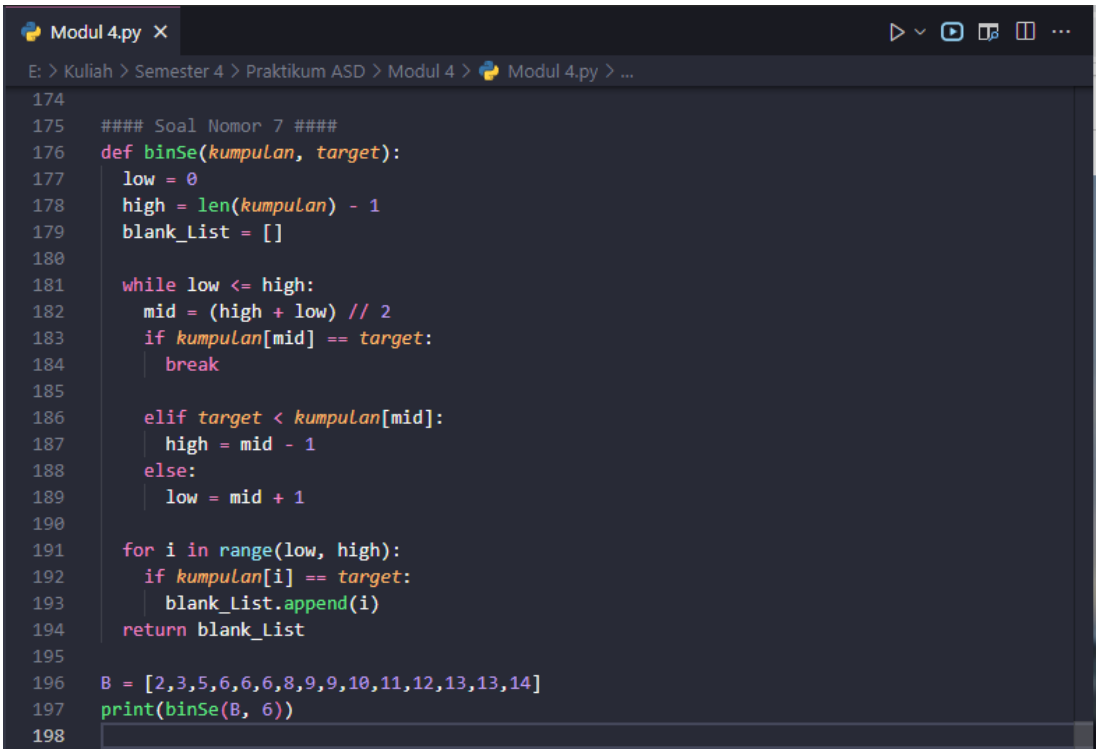

6. Binary search. Ubahlah fungsi binSe di halaman 43 agar mengembalikan index lokasi elemen yang ditemukan. Kalau tidak ketemu, akan mengembalikan False.



7. Binary search. Ubahlah fungsi binSe itu agar mengembalikan semua index lokasi elemen yang ditemukan. Contoh: mencari angka 6 pada list [2, 3, 5, 6, 6, 6, 8, 9, 9, 10,11, 12, 13, 13, 14] akan mengembalikan [3, 4, 5]. Karena sudah urut, "tinggal melihat kiri dan kanannya".



8. Pada permainan tebak angka yang sudah kamu buat di Modul 1 (soal nomer 12, halaman 16), kalau angka yang harus ditebak berada di antara 1 dan 100, seharusnya maksimal jumlah tebakan adalah 7. Kalau antara 1 dan 1000, maksimal jumlah tebakan adalah 10. Mengapa seperti itu? Bagaimanakah polanya.