

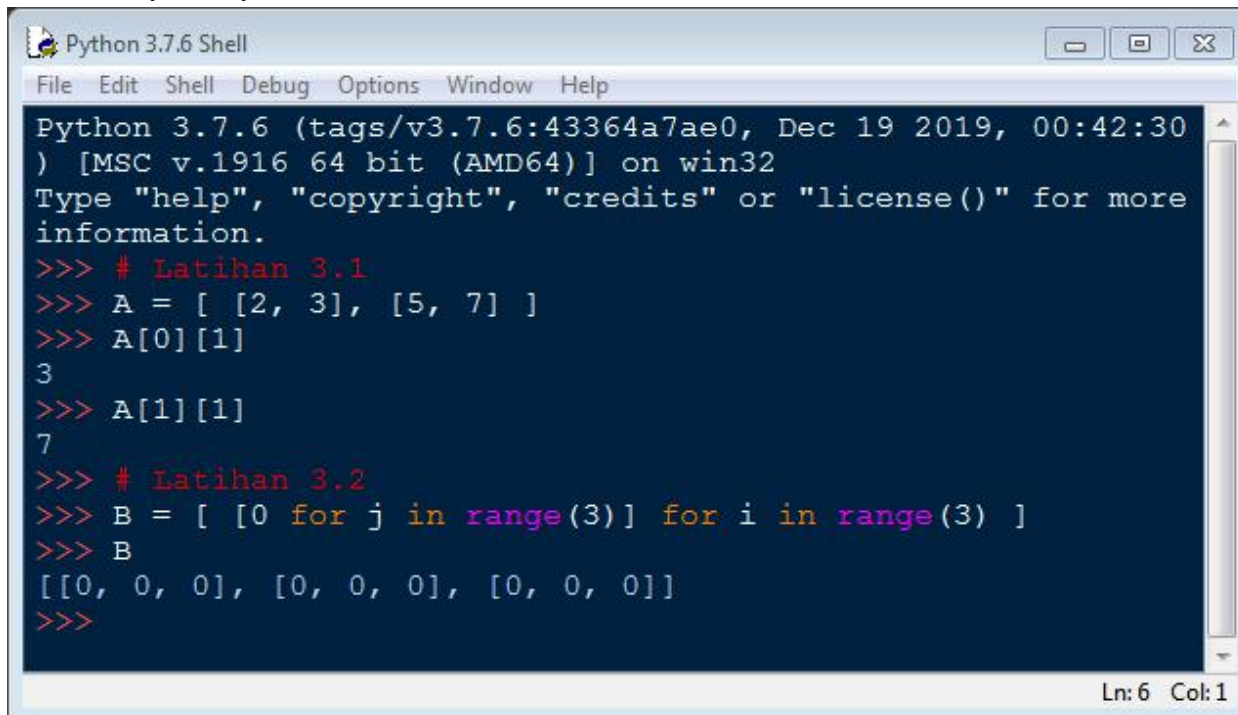
Laporan Praktikum Algoritma dan Struktur Data

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Modul : 3

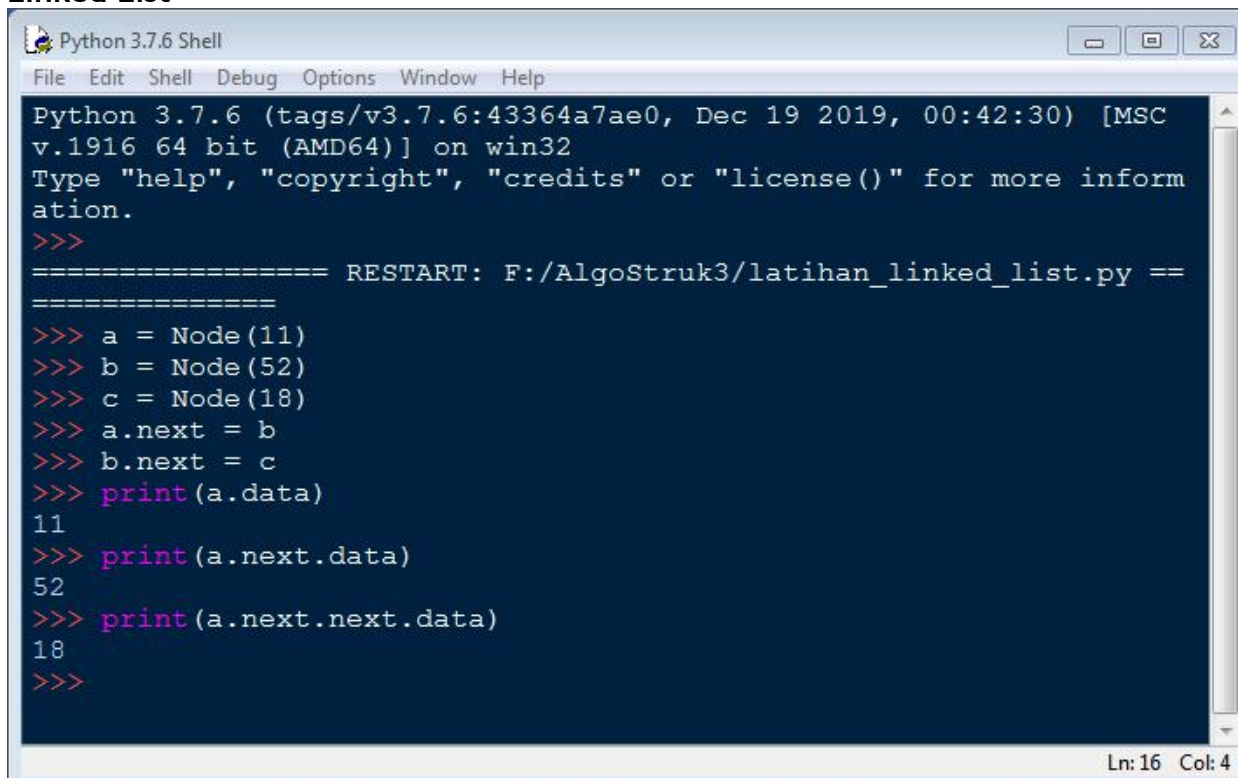
Latihan 3.1 & 3.2



```
Python 3.7.6 Shell
File Edit Shell Debug Options Window Help
Python 3.7.6 (tags/v3.7.6:43364a7ae0, Dec 19 2019, 00:42:30) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> # Latihan 3.1
>>> A = [ [2, 3], [5, 7] ]
>>> A[0][1]
3
>>> A[1][1]
7
>>> # Latihan 3.2
>>> B = [ [0 for j in range(3)] for i in range(3) ]
>>> B
[[0, 0, 0], [0, 0, 0], [0, 0, 0]]
>>>
```

Ln: 6 Col: 1

Linked List



```
Python 3.7.6 Shell
File Edit Shell Debug Options Window Help
Python 3.7.6 (tags/v3.7.6:43364a7ae0, Dec 19 2019, 00:42:30) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: F:/AlgoStruk3/latihan_linked_list.py =====
>>> a = Node(11)
>>> b = Node(52)
>>> c = Node(18)
>>> a.next = b
>>> b.next = c
>>> print(a.data)
11
>>> print(a.next.data)
52
>>> print(a.next.next.data)
18
>>>
```

Ln: 16 Col: 4

Mengunjungi Setiap Simpul dari Depan

latihan_linked_list.py - F:/AlgoStruk3/latihan_linked_list.py (3.7.6)

File Edit Format Run Options Window Help

```
class Node(object):
    """ Sebuah simpul di linked list """
    def __init__(self, data, next=None):
        self.data = data
        self.next = next

# Mengunjungi Setiap Simpul dari Depan
def kunjungi(head):
    curNode = head
    while curNode is not None:
        print(curNode.data)
        curNode = curNode.next
```

Python 3.7.6 Shell

File Edit Shell Debug Options Window Help

```
Python 3.7.6 (tags/v3.7.6:43364a7ae0, Dec 19 2019, 00:42:30) [MSC v.1916 64 bit
(AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: F:/AlgoStruk3/latihan_linked_list.py =====
>>> a = Node(11)
>>> b = Node(52)
>>> c = Node(18)
>>> a.next = b
>>> b.next = c
>>> kunjungi(a)
11
52
18
>>> |
```

Ln: 14 Col: 4

Soal-soal

1a) Cek Matriks

kode [~/Documents/Kuliah/Semester 4/AlgoStruk/Praktikum/3/kode] - .../1a.py - PyCharm

VCS Window Help

1a.py x

Run: 1a x

```
1 # 1
2 def cekMatrix(matrix):
3     panjang = len(matrix)
4     for x in matrix:
5         lebar = len(x)
6         for i in x:
7             if type(i) != int:
8                 break
9     return panjang == lebar and type(i) == int
10
11
12 m1 = [[2, 3], [2, 1]]
13 m2 = [[3, 3, 4], [4, 5, 7], [2, 0, 1]]
14 m3 = [[3, 3, 4], [4, '5', 7], [2, 0, '1']] # ada string
15 m4 = [[2, 1], [2, 3, 1]] # beda ukuran
16 m5 = [['5', 3, 5], [5, 6, 5]] # ada string
17
18 print(cekMatrix(m1))
19 print(cekMatrix(m2))
20 print(cekMatrix(m3))
21 print(cekMatrix(m4))
22 print(cekMatrix(m5))
23 |
```

Run: 1a x

"/home/dikawfa/Documents/Kuliah/Semester 4,
True
True
False
False
False
Process finished with exit code 0

1b) Ukuran Matriks

kode [-/Documents/Kuliah/Semester 4/AlgoStruk/Praktikum/3/kode] - .../1.py - PyCharm

VCS Window Help

latihan_linked_list.py × 1.py × 32.py × ... 1(4) ×

```
22 # print(cekMatrix(m5))
23
24
25 # 1b
26 def ukuranMatrix(matrix):
27     m = len(matrix)
28     for i in matrix:
29         n = len(i)
30     return m, n
31
32 ma = [[2, 3], [2, 1]]
33 mb = [[3, 3, 4], [4, 5, 7], [2, 0, 1]]
34 mc = [[3, 3, 4], [4, '5', 7]]
35 md = [[2, 1], [2, 1], [5, 7]]
36
37 print(ukuranMatrix(ma))
38 print(ukuranMatrix(mb))
39 print(ukuranMatrix(mc))
40 print(ukuranMatrix(md))
```

import sys; print('Python %s on %s' % sys.version, sys.path.exten...)

Python Console

>>> runfile('/home/dikawfa/...')
(2, 2)
(3, 3)
(2, 3)
(3, 2)
>>>

1c) Menjumlah Matriks

kode [-/Documents/Kuliah/Semester 4/AlgoStruk/Praktikum/3/kode] - .../1.py - PyCharm

VCS Window Help

latihan_linked_list.py × 1.py × 32.py × 2.py × 3.py × ... 1 × 1(1) × 1(2) × 1(3) × 1(4) × 1(5)

```
44 # 1c
45 def menjumlahkan(X, Y):
46     if ukuranMatrix(X) == ukuranMatrix(Y):
47         result = [[0, 0, 0],
48                   [0, 0, 0],
49                   [0, 0, 0]]
50         for i in range(len(X)):
51             for j in range(len(X[0])):
52                 result[i][j] = X[i][j] + Y[i][j]
53         for r in result:
54             print(r)
55         print('\n')
56     else:
57         print('! Ukuran matriks ngga sama woyy !')
58
59 A = [[12, 7, 3],
60      [4, 5, 6],
61      [7, 8, 9]]
62 B = [[5, 8, 1],
63      [6, 7, 3],
64      [4, 5, 9]]
65 C = [[12, 7],
66      [4, 5]]
67
68 menjumlahkan(A, B)
69 menjumlahkan(A, C)
```

import sys; print('Python %s on %s' % sys.version, sys.path.exten...)

Python Console

>>> runfile('/home/dikawfa/Documents/...')
[17, 15, 4]
[10, 12, 9]
[11, 13, 18]
! Ukuran matriks ngga sama woyy !
>>>

1d) Mengalikan Matriks

latihan_linked_list.py × 1.py × 32.py × 2.py × 3.py × 4.py ×

```
76 # 1d
77 def mengalikan(X, Y):
78     if len(X) != len(Y):
79         print('! Ukuran matrix tidak sesuai (baris Y != kolom X) !')
80         return None
81     if barisY == kolomX:
82         result = [[sum(a * b for a, b in zip(X_row, Y_col))
83                    for Y_col in zip(*Y)] for X_row in X]
84     for r in result:
85         print(r)
86     else:
87         print('! Ukuran matrix tidak sesuai (baris Y != kolom X) !')
88     print('\n')
89
90
91 X = [[1, 7, 3],
92      [4, 5, 6],
93      [7, 8, 9]]
94 Y = [[5, 0, 1, 2],
95      [6, 7, 3, 0],
96      [4, 5, 9, 1]]
97 Z = [[1, 2],
98      [2, 5]]
99 mengalikan(X, Y)
100 mengalikan(X, Z)
```

Shadows name 'X' from outer scope

Rename element Alt+Shift+Enter More actions... Alt+Enter

1(13) ×

```
"/home/dikawfa/Documents/Kuliah/Semester 4/AlgoStruk/Pra
import sys; print('Python %s on %s' % (sys.version, sys.
sys.path.extend(['/home/dikawfa/Documents/Kuliah/Semeste
Python Console
>>> runfile('/home/dikawfa/Documents/Kuliah/Semester 4/A
[114, 160, 60, 27]
[74, 97, 73, 14]
[119, 157, 112, 23]
! Ukuran matrix tidak sesuai (baris Y != kolom X) !
>>>
```

1e) Determinan Matriks

latihan_linked_list.py × 1.py × 32.py × 2.py × 3.py × 4.py ×

```
100 def determinan(A, total=0):
101     x = len(A[0])
102     z = 0
103     for i in range(len(A)):
104         if len(A[i]) == x:
105             z += 1
106     if z == len(A):
107         if x == len(A):
108             indices = list(range(len(A)))
109             if len(A) == 2 and len(A[0]) == 2:
110                 val = A[0][0] * A[1][1] - A[1][0] * A[0][1]
111                 return val
112             for fc in indices:
113                 As = A
114                 As = As[1:]
115                 height = len(As)
116                 for i in range(height):
117                     As[i] = As[i][0:fc] + As[i][fc + 1:]
118                 sign = (-1) ** (fc % 2)
119                 sub_det = determinan(As)
120                 total += sign * A[0][fc] * sub_det
121         else:
122             return "tidak bisa dihitung determinan, bukan matrix bujursangkar"
123     else:
124         return "tidak bisa dihitung determinan, bukan matrix bujursangkar"
125     return total
```

1(15) ×

```
"/home/dikawfa/Documents/Kuliah/Semester 4/AlgoStruk/Praktikum/3/kod
import sys; print('Python %s on %s' % (sys.version, sys.platform))
sys.path.extend(['/home/dikawfa/Documents/Kuliah/Semester 4/AlgoStruk/Pr
Python Console
>>> runfile('/home/dikawfa/Documents/Kuliah/Semester 4/AlgoStruk/Pra
>>> J = [[3, 1], [2, 5]]
... K = [[1, 2, 1], [3, 3, 1], [2, 1, 2]]
... L = [[1, -2, 0, 0], [3, 2, -3, 1], [4, 0, 5, 1], [2, 3, -1, 4]]
... M = [[3, 4], [2, 4], [1, 5]]
... print(determinan(J))
... print(determinan(K))
... print(determinan(L))
... print(determinan(M))
...
13
-6
200
tidak bisa dihitung determinan, bukan matrix bujursangkar
>>>|
```

2)

```
latihan_linked_list.py x 1.py x 2.py x 3.py x 4.py x 2 (1) x
1 # 2a
2 def buatNol(m, n=0):
3     if n != 0:
4         matriks = [[0 for i in range(m)] for j in range(n)]
5         for item in matriks:
6             print(item)
7     else:
8         matriks = [[0 for i in range(m)] for j in range(m)]
9         for item in matriks:
10            print(item)
11        print('\n')
12
13        buatNol(3)
14        buatNol(2, 4)
15
16        # 2b
17        def buatIdentitas(m):
18            matriks = [[1 if j == i else 0 for j in range(m)] for i in range(m)]
19            for baris in matriks:
20                print(baris)
21            print('\n')
22
23
24        buatIdentitas(4)
25        buatIdentitas(3)
26
```

Python Console

```
>>> runfile('/home/dikawfa/Docu
[0, 0, 0]
[0, 0, 0]
[0, 0, 0]

[0, 0, 0]
[0, 0, 0]
[0, 0, 0]
[0, 0, 0]

[1, 0, 0, 0]
[0, 1, 0, 0]
[0, 0, 1, 0]
[0, 0, 0, 1]

[1, 0, 0]
[0, 1, 0]
[0, 0, 1]

>>>
```


3)

```
latihan_linked_list.py x 1.py x 2.py x 3.py x 4.py x
1 class Node(object):
2     def __init__(self, data, next=None):
3         self.data = data
4         self.next = next
5     def makeNode(list):
6         a = Node(list[0])
7         if len(list) > 1:
8             b = a
9             for i in range(1, len(list)):
10                b.next = Node(list[i])
11                b = b.next
12        return a
13
14    def kunjungi(head):
15        curNode = head
16        while curNode is not None:
17            print(curNode.data)
18            curNode = curNode.next
19
20    def cari(head, yang_dicari):
21        temp = head
22        while temp is not None:
23            if temp.data == yang_dicari:
24                return temp
25            temp = temp.next
26        return Node(None)
```

```
latihan_linked_list.py x 1.py x 2.py x 3.py x 4.py x
28
29    def tambahdepan(head):
30        temp = Node('tambah depan', head)
31        return temp
32
33
34    def tambahAkhir(head):
35        temp = head
36        while temp.next is not None:
37            temp = temp.next
38        temp.next = Node('tambah akhir')
39        return head
40
41
42    def tambah(head, posisi):
43        """Menambahkan simpul sebelum posisi"""
44        temp = head
45        while temp is not None:
46            if temp.next.data == posisi:
47                temp_belakang = temp.next
48                temp.next = Node('tambah tengah', temp_belakang)
49                return head
50            temp = temp.next
51        return None
52
53
```

```
latihan_linked_list.py x 1.py x 2.py x 3.py x 4.py x
50 |         temp = temp.next
51 |     return None
52 |
53 |
54 | def hapus(head, posisi):
55 |     temp = head
56 |     while temp is not None:
57 |         if temp.next.data == posisi:
58 |             temp_belakang = temp.next.next
59 |             temp.next = temp_belakang
60 |             return head
61 |         temp = temp.next
62 |     return head
63 |
64 | a = Node(1)
65 | b = Node(2)
66 | c = Node(3)
67 | d = Node(4)
68 | a.next = b
69 | b.next = c
70 | c.next = d
71 |
```

4)

```
latihan_linked_listpy x 1.py x 2.py x 3.py x 4.py x Python Console x 3 x 4 x
13
14
15 def cetakDepan():
16     a.next = b
17     b.next = c
18     c.next = d
19     print(a.data)
20     print(a.next.data)
21     print(a.next.next.data)
22     print(a.next.next.next.data)
23
24
25 def cetakBelakang():
26     d.prev = c
27     c.prev = b
28     b.prev = a
29     print(d.data)
30     print(d.prev.data)
31     print(d.prev.prev.data)
32     print(d.prev.prev.prev.data)
```

```
"/home/dikawfa/Document
import sys; print('Pyth
sys.path.extend(['/home
Python Console
>>> runfile('/home/dika
>>> cetakDepan()
37
38
39
40
>>> cetakBelakang()
40
39
38
37
>>>
```

```
latihan_linked_listpy x 1.py x 2.py x 3.py x 4.py x 4 x
35 # b
36 class Node(object):
37     def __init__(self, nama, next=None):
38         self.data = nama
39         self.next = None
40         self.prev = None
41
42
43 a = Node(37)
44 b = Node(38)
45 c = Node(39)
46 d = Node(40)
47
48
49 def tambahdepan():
50     a.next = b
51     b.next = c
52     c.next = d
53     i = input("Masukan nilai tambahan untuk simpul diawal: ")
54     L = Node(i)
55     L.next = a
56     print(L.data)
57     print(L.next.data)
58     print(L.next.next.data)
59     print(L.next.next.next.data)
60     print(L.next.next.next.next.data)
```

```
"/home/dikawfa/Documents/Kuliah/Semester 4/AlgoStr
import sys; print('Python %s on %s' % (sys.version
sys.path.extend(['/home/dikawfa/Documents/Kuliah/S
Python Console
>>> runfile('/home/dikawfa/Documents/Kuliah/Semest
>>> tambahdepan()
Masukan nilai tambahan untuk simpul diawal: >? 12
12
37
38
39
40
>>>
```


latihan_linked_list.py × 1.py × 2.py × 3.py × 4.py ×

62

c

64 class Node(object):

65 def __init__(self, nama, next=None):

66 self.data = nama

67 self.next = None

68 self.prev = None

69

70

71 def tambahAkhir():

72 i = input("Masukan nilai tambahan untuk simpul diakhir: ")

73 a = Node(37)

74 b = Node(38)

75 c = Node(39)

76 d = Node(40)

77 L = Node(i)

78 d.prev = c

79 c.prev = b

80 b.prev = a

81 L.prev = d

82 print(L.prev.prev.prev.prev.data)

83 print(L.prev.prev.prev.data)

84 print(L.prev.prev.data)

85 print(L.prev.data)

86 print(L.data)

87

4 ×

"/home/dikawfa/Documents/Kuliah/Semester 4/AlgoStru

import sys; print('Python %s on %s' % (sys.version, sys.path.extend(['/home/dikawfa/Documents/Kuliah/Se

Python Console

>>> runfile('/home/dikawfa/Documents/Kuliah/Semeste

>>> tambahdepan()

Masukan nilai tambahan untuk simpul diawal: >? 12

12

37

38

39

40

>>> tambahAkhir()

Masukan nilai tambahan untuk simpul diakhir: >? 10

37

38

39

40

10

>>> |