

Nama : Nur Fitria Melani

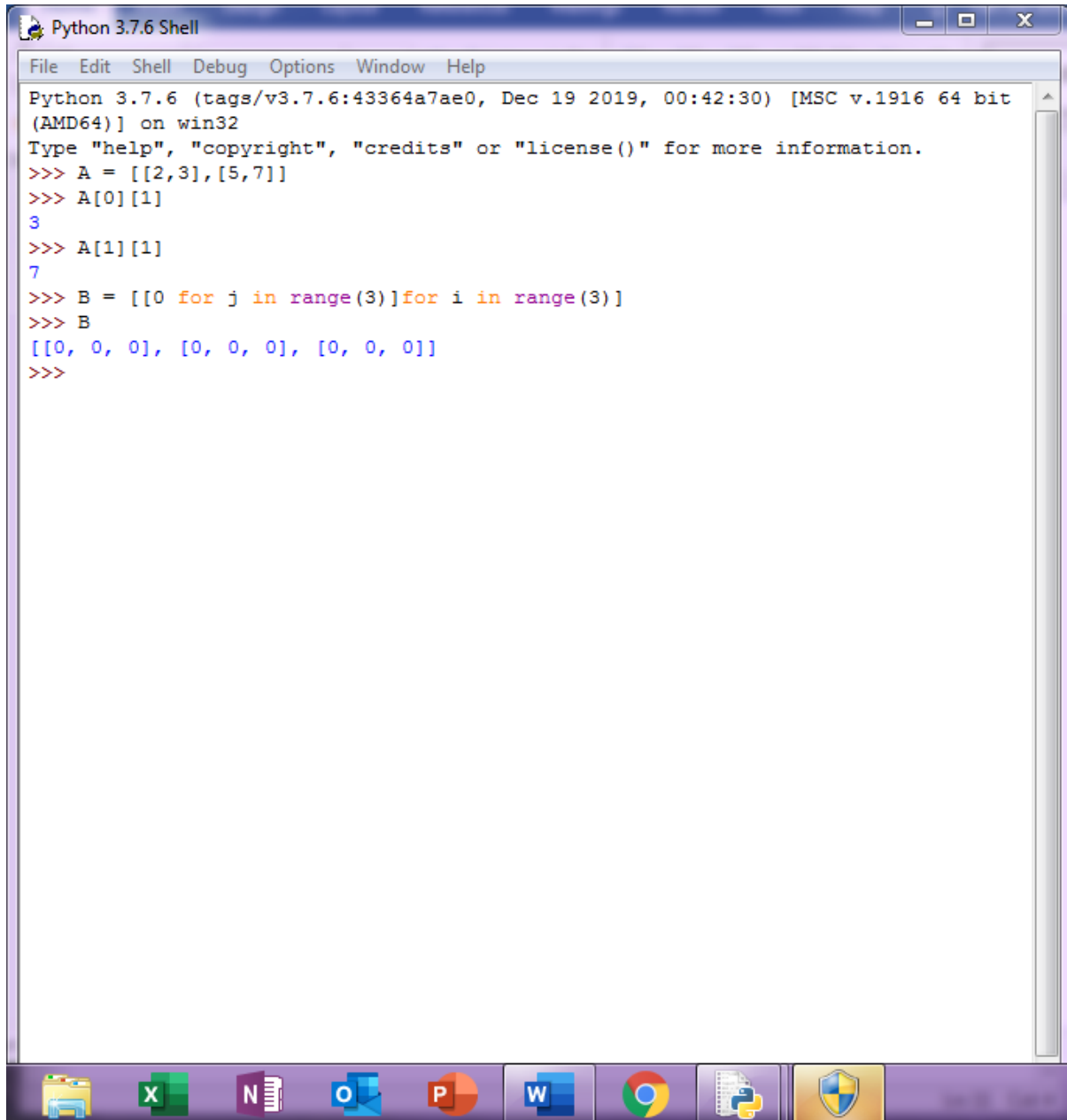
NIM : L200180012

Kelas : A

MODUL 3 Collections, Arrays, and Linked Structures

3.2 Array dan Array Dua Dimensi

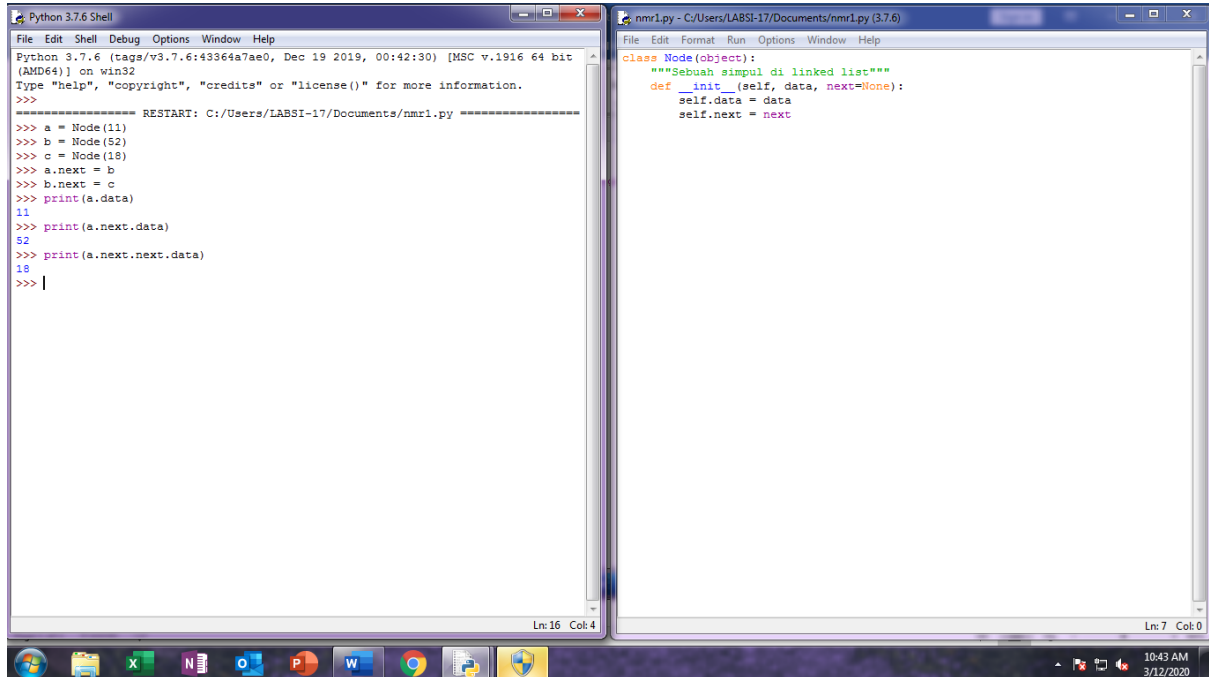
Latihan 3.1 dan 3.2

A screenshot of a Python 3.7.6 Shell window. The window has a title bar that says "Python 3.7.6 Shell" and standard Windows window controls (minimize, maximize, close). Below the title bar is a menu bar with "File", "Edit", "Shell", "Debug", "Options", "Window", and "Help". The main area of the window contains a text editor with the following Python code:

```
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.
>>> A = [[2,3],[5,7]]
>>> A[0][1]
3
>>> A[1][1]
7
>>> B = [[0 for j in range(3)]for i in range(3)]
>>> B
[[0, 0, 0], [0, 0, 0], [0, 0, 0]]
>>>
```

The window is running on a Windows operating system, as evidenced by the taskbar at the bottom. The taskbar shows several application icons: File Explorer, Microsoft Excel (X), Microsoft Word (N), Microsoft Outlook (O), Microsoft PowerPoint (P), Microsoft Word (W), Google Chrome, and a shield icon representing Windows Security. The system clock in the bottom right corner shows the date and time as 12/19/2019, 12:42 PM.

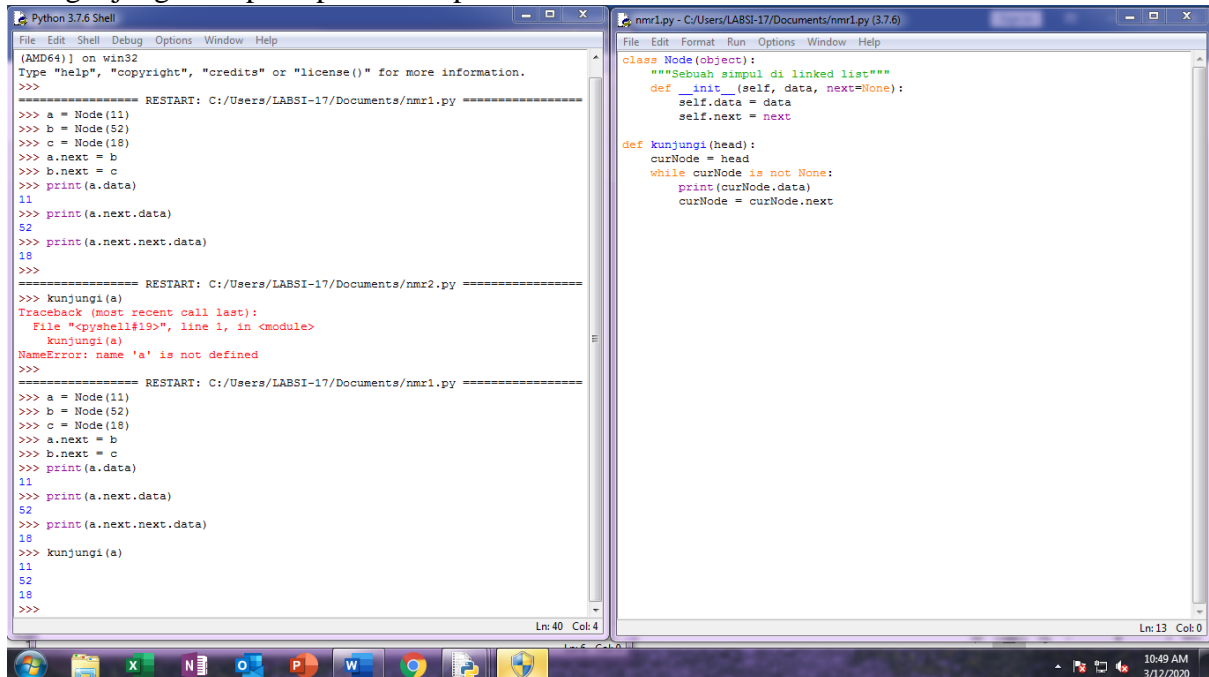
3.3 Linked Structures



```
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: C:/Users/LABSI-17/Documents/nmr1.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
>>> |

nmr1.py - C:/Users/LABSI-17/Documents/nmr1.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

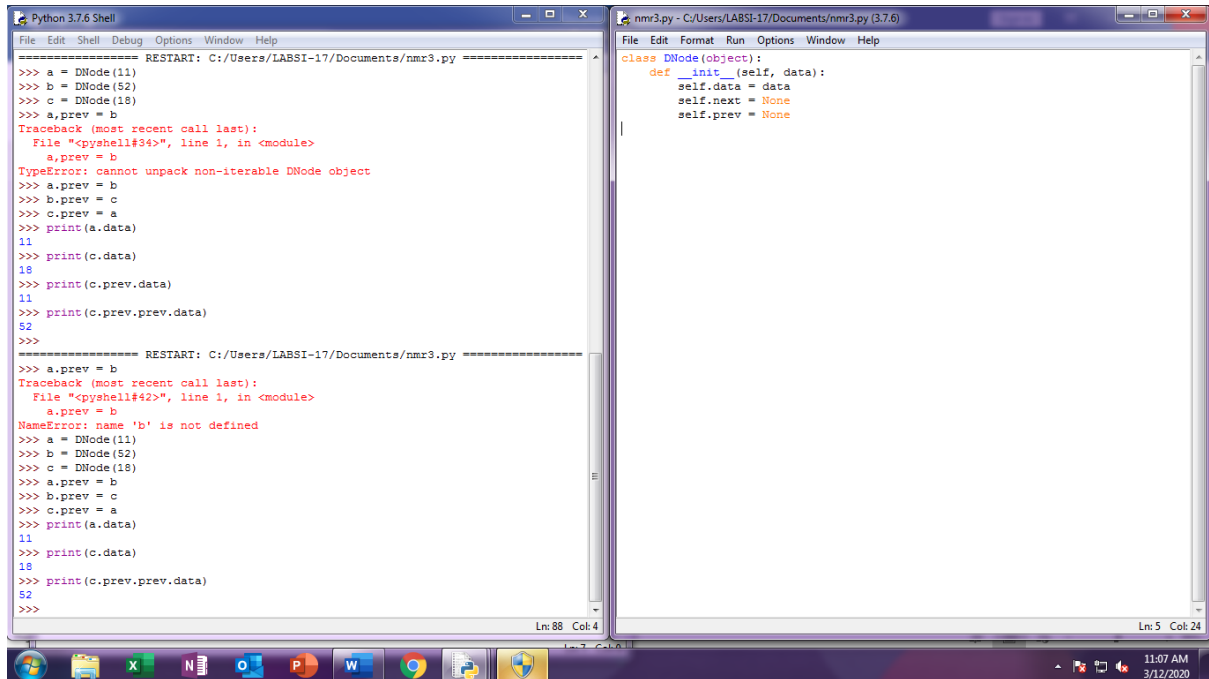


```
Python 3.7.6 Shell
File Edit Shell Debug Options Window Help
Python 3.7.6 (tags/v3.7.6:43364a7ae0, Dec 19 2019, 00:42:30) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Users/LABSI-17/Documents/nmr1.py =====
>>> 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
>>>
===== RESTART: C:/Users/LABSI-17/Documents/nmr2.py =====
>>> kunjungi(a)
Traceback (most recent call last):
  File "<pyshell#19>", line 1, in <module>
    kunjungi(a)
NameError: name 'a' is not defined
>>>
===== RESTART: C:/Users/LABSI-17/Documents/nmr1.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
>>> kunjungi(a)
11
52
18
>>>

nmr1.py - C:/Users/LABSI-17/Documents/nmr1.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

def kunjungi(head):
    curNode = head
    while curNode is not None:
        print(curNode.data)
        curNode = curNode.next
```

Advanced Linked List



The image shows a screenshot of a Python 3.7.6 Shell and a text editor. The shell window on the left displays the execution of a script named `nmr3.py`. It shows the creation of three `DNode` objects (`a`, `b`, and `c`) and attempts to link them. The first attempt results in a `TypeError: cannot unpack non-iterable DNode object` when trying to assign `a, prev = b`. The second attempt results in a `NameError: name 'b' is not defined` when trying to assign `a, prev = b` after a restart. The text editor on the right shows the definition of the `DNode` class:

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

TUGAS

Nomor 1.



The image shows a screenshot of a Python 3.7.2 Shell window. The window title is `nomor1.py - D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\nomor1.py (3.7.2)`. The code defines three functions: `cekKonsisten`, `cekInt`, and `ordo`.

```
def cekKonsisten(n):
    x = len(n[0])
    z = 0
    for i in range(len(n)):
        if (len(n[i]) == x):
            z+=1
    if (z == len(n)):
        print("Matriks konsisten")
    else:
        print("Matriks tidak konsisten")

def cekInt(n):
    x = 0
    y = 0
    for i in n:
        for j in i:
            if (str(j).isdigit() == False):
                print("Mempunyai Tipe Data yang berbeda")
                break
            else:
                x+=1
                break
    if (x==y):
        print("Mempunyai Tipe Data yang sama")

def ordo(n):
    x,y = 0,0
    for i in range(len(n)):
        x+=1
        y = len(n[i])
    print("Mempunyai ordo "+str(x)+"x"+str(y))
```

```
def jumlah(n,m):
    x,y = 0,0
    for i in range(len(n)):
        x+=1
        y = len(n[i])
        xy = [0 for j in range(x)] for i in range(y)]

    z = 0
    if(len(n)==len(m)):
        for i in range(len(n)):
            if(len(n[i]) == len(m[i])):
                z+=1
        if(z==len(n) and z==len(m)):
            print("Ukuran sama")
            for i in range(len(n)):
                for j in range(len(n[i])):
                    xy[i][j] = n[i][j] + m[i][j]
            print(xy)
        else:
            print("Ukuran berbeda")

def kali(n,m):
    aa = 0
    x,y = 0,0
    for i in range(len(n)):
        x+=1
        y = len(n[i])
    v,w = 0,0
    for i in range(len(m)):
        v+=1
        w = len(m[i])

    if(y==v):
        print("Dapat Dikalikan")
        vwxy = [0 for j in range(w)] for i in range(x)]
        for i in range(len(n)):
            for j in range(len(m[0])):
                for k in range(len(m)):
                    #print(n[i][k], m[k][j])
                    vwxy[i][j] += n[i][k] * m[k][j]

        print(vwxy)
```

Ln: 36 Col: 27

```
        else:
            print("Tidak memenuhi syarat")

def hitungDeterminan(A, total=0):
    x = len(A[0])
    z = 0
    for i in range(len(A)):
        if (len(A[i]) == x):
            z+=1
    if(z == len(A)):
        if(x==len(A)):
            indices = list(range(len(A)))
            if len(A) == 2 and len(A[0]) == 2:
                val = A[0][0] * A[1][1] - A[1][0] * A[0][1]
                return val
            for fc in indices:
                As = A
                As = As[1:]
                height = len(As)
                for i in range(height):
                    As[i] = As[i][0:fc] + As[i][fc+1:]
                sign = (-1) ** (fc % 2)
                sub_det = hitungDeterminan(As)
                total += sign * A[0][fc] * sub_det
        else:
            return "Tidak bisa menghitung determinan, bukan matrix bujursangkar"
    else:
        return "Tidak bisa menghitung determinan, bukan matrix bujursangkar"
    return total

a = [[1,2],[3,4]]
b = [[3,4],[5,6]]
c = [[1,"a","b"],["c",5]]
d = [[4,1],[2,4],[3,5]]
e = [[1,3,6],[2,4,5]]
f = [[1,2,3],[4,5,6],[2,4,3]]
g = [[0,-3,4,2],[2,-1,-5,2],[3,7,6,5],[6,1,-8,4]]
cekKonsisten(a)
cekKonsisten(c)
cekKonsisten(g)
cekInt(a)
cekInt(c)
```

Ln: 36 Col: 27

```

        for fc in indices:
            As = A
            As = As[1:]
            height = len(As)
            for i in range(height):
                As[i] = As[i][0:fc] + As[i][fc+1:]
                sign = (-1) ** (fc % 2)
                sub_det = hitungDeterminan(As)
                total += sign * A[0][fc] * sub_det
            else:
                return "Tidak bisa menghitung determinan, bukan matrix bujursangkar"
        else:
            return "Tidak bisa menghitung determinan, bukan matrix bujursangkar"
        return total

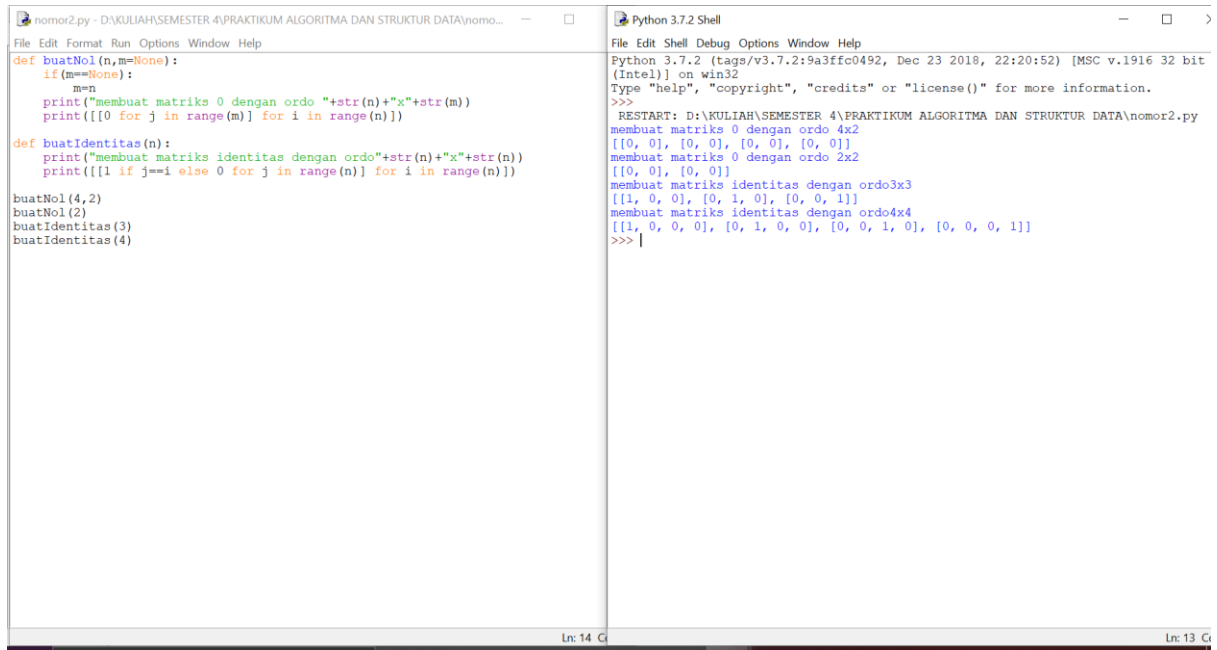
a = [[1,2],[3,4]]
b = [[3,4],[5,6]]
c = [[1,"a","b"],["c",5]]
d = [[4,1],[2,4],[3,5]]
e = [[1,3,6],[2,4,5]]
f = [[1,2,3],[4,5,6],[2,4,3]]
g = [[0,-3,4,2],[2,-1,-5,2],[3,7,6,5],[6,1,-8,4]]
cekKonsisten(a)
cekKonsisten(c)
cekKonsisten(g)
cekInt(a)
cekInt(c)
cekInt(f)
ordo(a)
ordo(f)
ordo(d)
ordo(e)
jumlah(a,f)
jumlah(a,b)
kali(a,b)
kali(f,e)
print(hitungDeterminan(a))
print(hitungDeterminan(d))
print(hitungDeterminan(g))
print(hitungDeterminan(e))

```

```
Python 3.7.2 Shell
File Edit Shell Debug Options Window Help
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 22:20:52) [MSC v.1916 32 bit
(Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
RESTART: D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\nomor1.py
Matriks konsisten
Matriks tidak konsisten
Matriks konsisten
Mempunyai Tipe Data yang sama
Mempunyai Tipe Data yang berbeda
Mempunyai Tipe Data yang sama
Mempunyai ordo 2x2
Mempunyai ordo 3x3
Mempunyai ordo 3x2
Mempunyai ordo 2x3
Ukuran berbeda
Ukuran sama
[[4, 6], [8, 10]]
Dapat Dikalikan
[[13, 16], [29, 36]]
Tidak memenuhi syarat
-2
Tidak bisa menghitung determinan, bukan matrix bujursangkar
-468
Tidak bisa menghitung determinan, bukan matrix bujursangkar
>>> |
```

Ln: 25 Col: 4

Nomor 2.



```
File Edit Format Run Options Window Help
def buatNol(n,m=None):
    if m==None:
        m=n
    print("membuat matriks 0 dengan ordo "+str(n)+"x"+str(m))
    print([[0 for j in range(m)] for i in range(n)])
def buatIdentitas(n):
    print("membuat matriks identitas dengan ordo "+str(n)+"x"+str(n))
    print([[1 if j==i else 0 for j in range(n)] for i in range(n)])
buatNol(4,2)
buatNol(2)
buatIdentitas(3)
buatIdentitas(4)
```

```
File Edit Shell Debug Options Window Help
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 22:20:52) [MSC v.1916 32 bit
(Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
RESTART: D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\nomor2.py
membuat matriks 0 dengan ordo 4x2
[[0, 0], [0, 0], [0, 0], [0, 0]]
membuat matriks 0 dengan ordo 2x2
[[0, 0], [0, 0]]
membuat matriks identitas dengan ordo3x3
[[1, 0, 0], [0, 1, 0], [0, 0, 1]]
membuat matriks identitas dengan ordo4x4
[[1, 0, 0, 0], [0, 1, 0, 0], [0, 0, 1, 0], [0, 0, 0, 1]]
>>>
```

Ln: 14 C

Ln: 13 C

Nomor 3.

```
nomor3.py - D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\nomor3.py (3.7.2)
File Edit Format Run Options Window Help

class Node:
    def __init__(self, data):
        self.data = data
        self.next = None
class LinkedList:
    def __init__(self):
        self.head = None
    def pushAw(self, new_data):
        new_node = Node(new_data)
        new_node.next = self.head
        self.head = new_node
    def pushAk(self, data):
        if (self.head == None):
            self.head = Node(data)
        else:
            current = self.head
            while (current.next != None):
                current = current.next
            current.next = Node(data)
        return self.head
    def insert(self, data, pos):
        node = Node(data)
        if not self.head:
            self.head = node
        elif pos==0:
            node.next = self.head
            self.head = node
        else:
            prev = None
            current = self.head
            current_pos = 0
            while (current_pos < pos) and current.next:
                prev = current
                current = current.next
                current_pos +=1
            prev.next = node
            node.next = current
        return self.head
    def deleteNode(self, position):
        if self.head == None:
            return
        temp = self.head
        if position == 0:
            self.head = temp.next
            temp = None
            return
        for i in range(position -1 ):
            temp = temp.next
            if temp is None:
                break
        if temp is None:
            return
        if temp.next is None:
            return
        next = temp.next.next
        temp.next = next
        temp.next = None
    def search(self, x):
        current = self.head
        while current != None:
            if current.data == x:
                return "True"
            current = current.next
        return "False"
    def display(self):
        current = self.head
        while current is not None:
            print(current.data, end = ' ')
            current = current.next

list1 = LinkedList()
list1.pushAw(30)
list1.pushAw(27)
list1.pushAw(39)
list1.pushAw(56)
list1.pushAw(9)
list1.pushAw(17)
list1.pushAk(3)
list1.deleteNode(0)
list1.insert(8,5)
print(list1.search(30))
print(list1.search(12))
list1.display()
```

```
Python 3.7.2 Shell
File Edit Shell Debug Options Window Help
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 22:20:52) [MSC v.1916 32 bit
(Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
RESTART: D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\nomor3.py
True
False
9 56 39 27 30 8 3
>>> |
```


Nomor 4.

```
nomor4.py - D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\nomor4.py (3.7.2)
File Edit Format Run Options Window Help
class Node:
    def __init__(self, data):
        self.data = data
        self.prev = None
class DoublyLinkedList:
    def __init__(self):
        self.head = None
    def awal(self, new_data):
        print("Menambah simpul pada awal", new_data)
        new_node = Node(new_data)
        new_node.next = self.head
        if self.head is not None:
            self.head.prev = new_node
        self.head = new_node
    def akhir(self, new_data):
        print("Menambah simpul pada akhir", new_data)
        new_node = Node(new_data)
        new_node.next = None
        if self.head is None:
            new_node.prev = None
            self.head = new_node
            return
        last = self.head
        while (last.next is not None):
            last = last.next
        last.next = new_node
        new_node.prev = last
        return
    def printList(self, node):
        print("\nDari Depan :")
        while (node is not None):
            print(" % d" % (node.data))
            last = node
            node = node.next
        print("\nDari Belakang :")
        while (last is not None):
            print(" % d" % (last.data))
            last = last.prev

list1 = DoublyLinkedList()
list1.awal(8)
list1.awal(7)
list1.akhir(1)
list1.akhir(3)
list1.printList(list1.head)
```

```
Python 3.7.2 Shell
File Edit Shell Debug Options Window Help
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 22:20:52) [MSC v.1916 32 bit
(Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
RESTART: D:\KULIAH\SEMESTER 4\PRAKTIKUM ALGORITMA DAN STRUKTUR DATA\nomor4.py
Menambah simpul pada awal 8
Menambah simpul pada awal 7
Menambah simpul pada akhir 1
Menambah simpul pada akhir 3

Dari Depan :
7
8
1
3

Dari Belakang :
3
1
8
7
>>> |
```