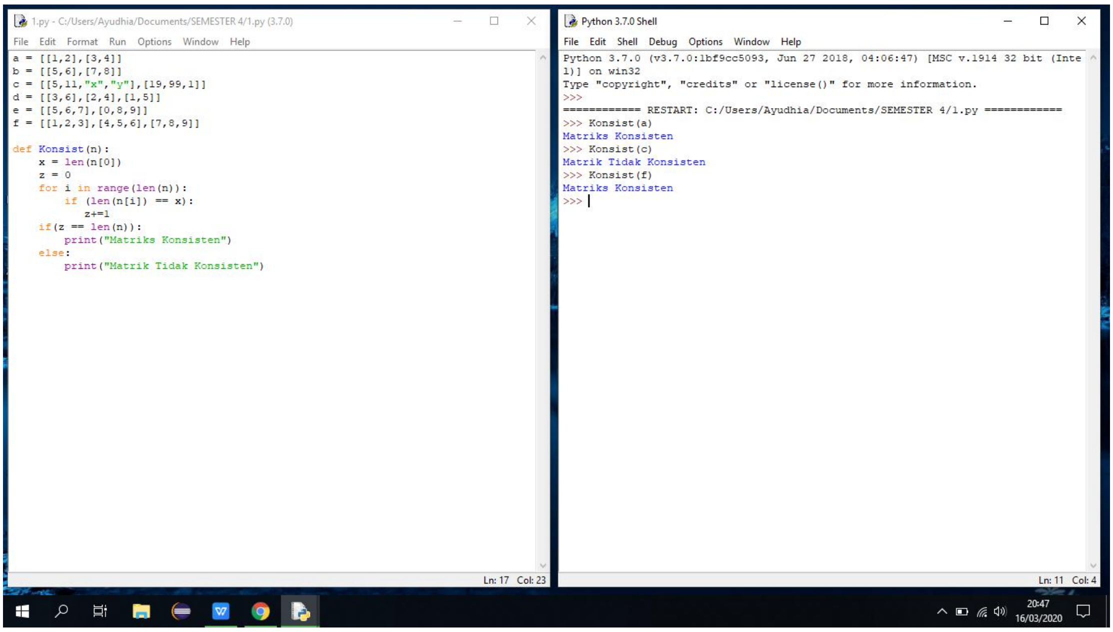
Nama : Ayudhia Isnafiani Fanada
NIM : L200180095
Kelas : D

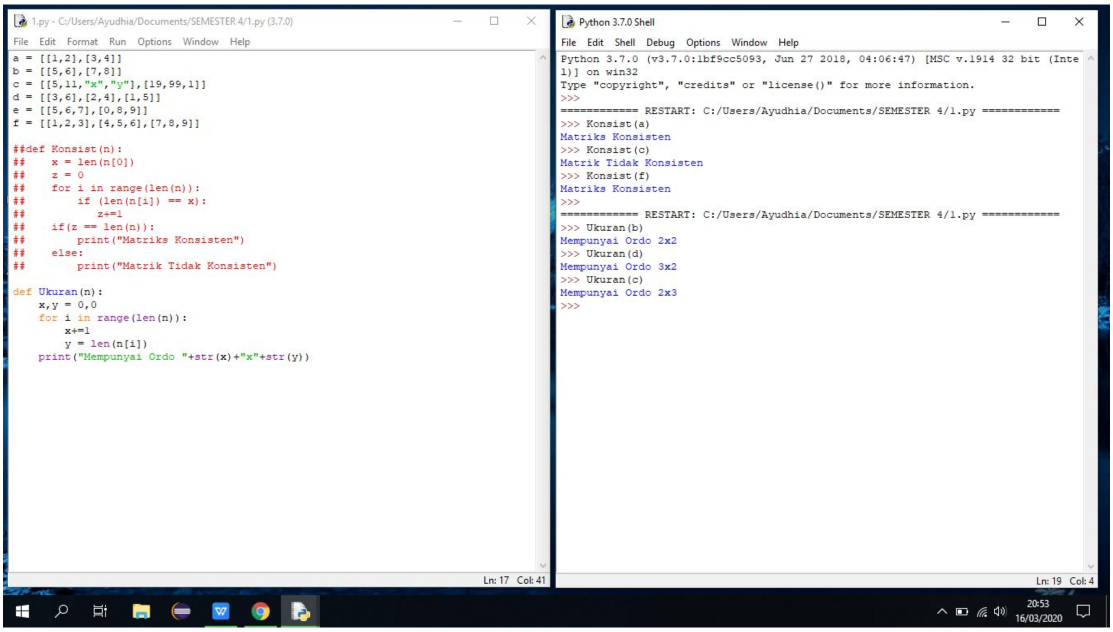
ALGORITMA DAN STRUKTUR DATA
MODUL 3

NO. 1


1.py - C:/Users/Ayudhia/Documents/SEMESTER 4/1.py (3.7.0)
File Edit Format Run Options Window Help
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Ln: 17 Col: 23
Ln: 11 Col: 4
20:47
16/03/2020

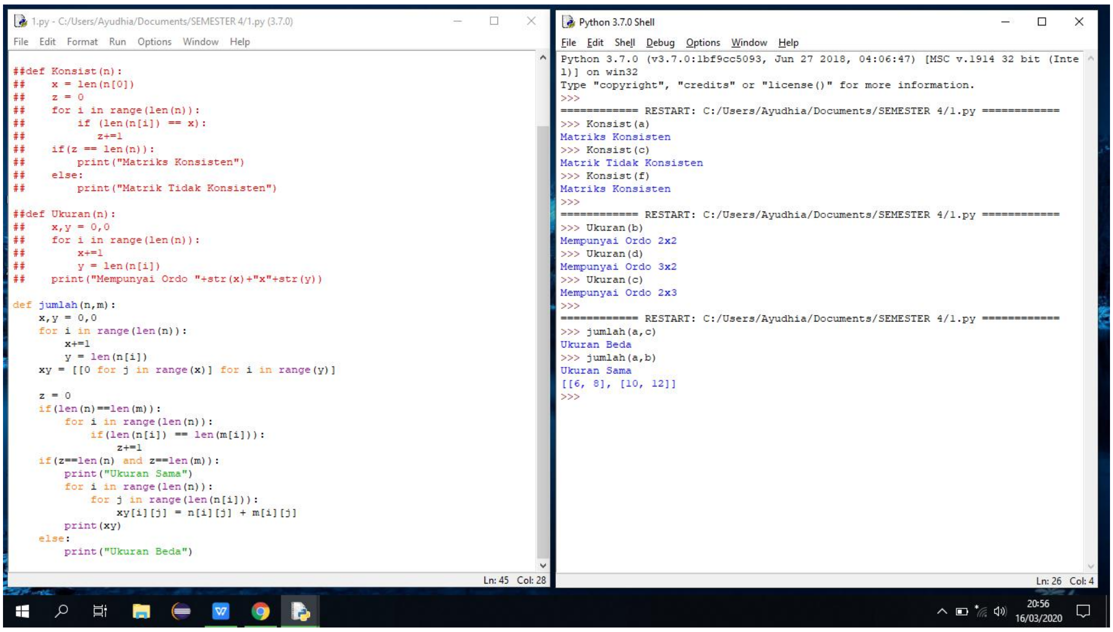
```
a = [[1,2],[3,4]]
b = [[5,6],[7,8]]
c = [[5,11,"x","y"],[19,99,1]]
d = [[3,6],[2,4],[1,5]]
e = [[5,6,7],[0,8,9]]
f = [[1,2,3],[4,5,6],[7,8,9]]

def Konsist(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("Matrik Tidak Konsisten")
```

```
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Inte
l)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/1.py ============
>>> Konsist(a)
Matriks Konsisten
>>> Konsist(c)
Matrik Tidak Konsisten
>>> Konsist(f)
Matriks Konsisten
>>> 
```


1.py - C:/Users/Ayudhia/Documents/SEMESTER 4/1.py (3.7.0)
File Edit Format Run Options Window Help
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Ln: 17 Col: 41
Ln: 19 Col: 4
20:53
16/03/2020

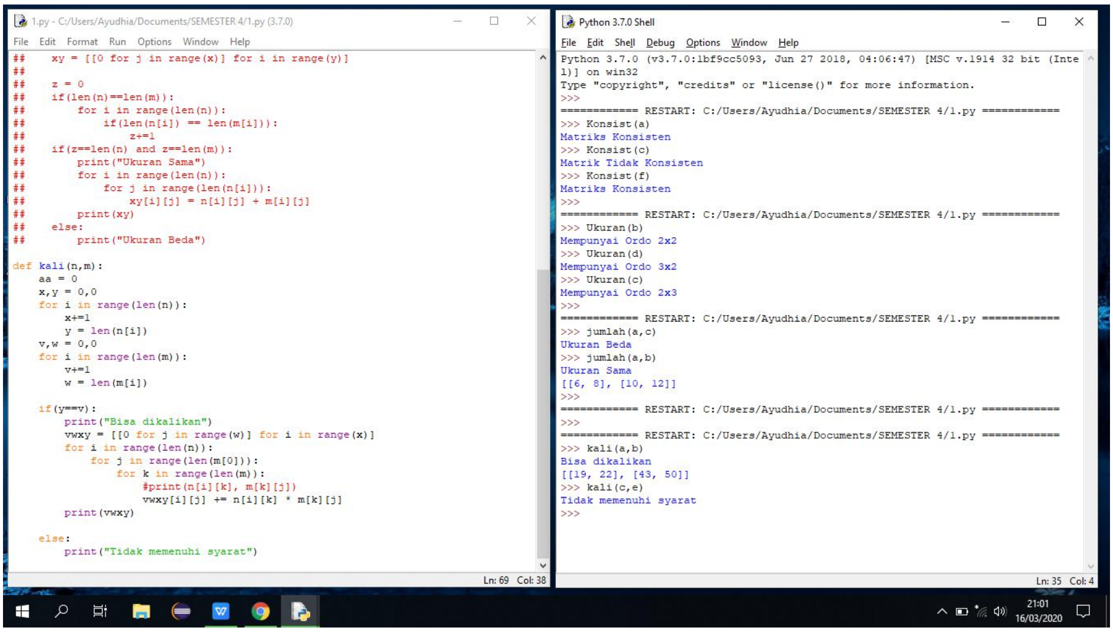
```
a = [[1,2],[3,4]]
b = [[5,6],[7,8]]
c = [[5,11,"x","y"],[19,99,1]]
d = [[3,6],[2,4],[1,5]]
e = [[5,6,7],[0,8,9]]
f = [[1,2,3],[4,5,6],[7,8,9]]

##def Konsist(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("Matrik Tidak Konsisten")

def Ukuran(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))
```

```
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Inte
l)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/1.py ============
>>> Konsist(a)
Matriks Konsisten
>>> Konsist(c)
Matrik Tidak Konsisten
>>> Konsist(f)
Matriks Konsisten
>>>
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/1.py ============
>>> Ukuran(b)
Mempunyai Ordo 2x2
>>> Ukuran(d)
Mempunyai Ordo 3x2
>>> Ukuran(c)
Mempunyai Ordo 2x3
>>>
```


1.py - C:/Users/Ayudhia/Documents/SEMESTER 4/1.py (3.7.0)
File Edit Format Run Options Window Help
Ln: 45 Col: 28
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Ln: 26 Col: 4
20:56
16/03/2020

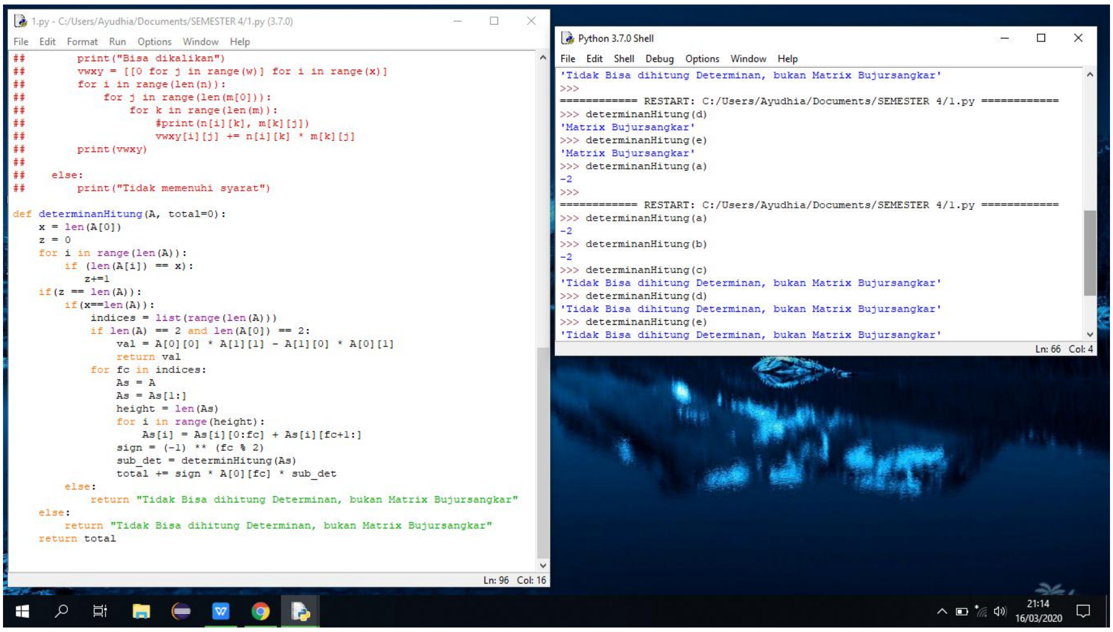
```python
##def Konsist(n):
##    x = len(n[0])
##    z = 0
##    for i in range(len(n)):
##        if (len(n[i]) == x):
##           z+=1
##    if(z == len(n)):
##        print("Matriks Konsisten")
##    else:
##        print("Matrik Tidak Konsisten")

##def Ukuran(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 Beda")
```

```
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Inte
l)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> 
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/1.py ============
>>> Konsist(a)
Matriks Konsisten
>>> Konsist(c)
Matrik Tidak Konsisten
>>> Konsist(f)
Matriks Konsisten
>>> 
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/1.py ============
>>> Ukuran(b)
Mempunyai Ordo 2x2
>>> Ukuran(d)
Mempunyai Ordo 3x2
>>> Ukuran(c)
Mempunyai Ordo 2x3
>>> 
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/1.py ============
>>> jumlah(a,c)
Ukuran Beda
>>> jumlah(a,b)
Ukuran Sama
[[6, 8], [10, 12]]
>>> 
```


1.py - C:/Users/Ayudhia/Documents/SEMESTER 4/1.py (3.7.0)
File Edit Format Run Options Window Help
Ln: 69 Col: 38
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Ln: 35 Col: 4
21:01
16/03/2020

```python
##    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 Beda")

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("Bisa 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)

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

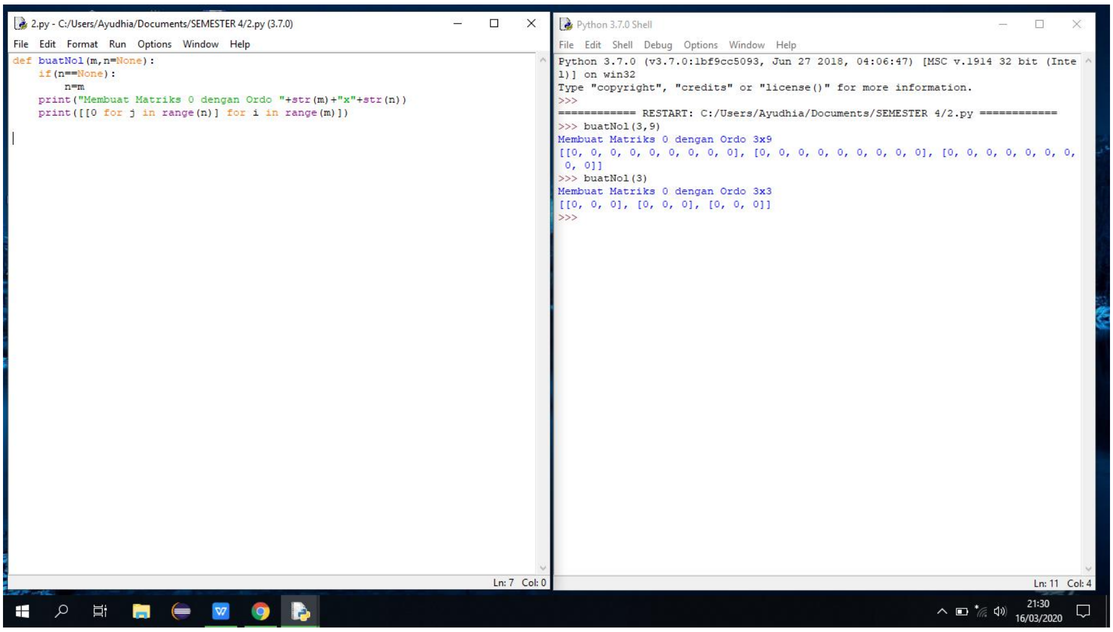
```
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Inte
l)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> 
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/1.py ============
>>> Konsist(a)
Matriks Konsisten
>>> Konsist(c)
Matrik Tidak Konsisten
>>> Konsist(f)
Matriks Konsisten
>>> 
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/1.py ============
>>> Ukuran(b)
Mempunyai Ordo 2x2
>>> Ukuran(d)
Mempunyai Ordo 3x2
>>> Ukuran(c)
Mempunyai Ordo 2x3
>>> 
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/1.py ============
>>> jumlah(a,c)
Ukuran Beda
>>> jumlah(a,b)
Ukuran Sama
[[6, 8], [10, 12]]
>>> 
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/1.py ============
>>> 
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/1.py ============
>>> kali(a,b)
Bisa dikalikan
[[19, 22], [43, 50]]
>>> kali(c,e)
Tidak memenuhi syarat
>>> 
```


1.py - C:/Users/Ayudhia/Documents/SEMESTER 4/1.py (3.7.0)
File Edit Format Run Options Window Help
Ln: 96 Col: 16
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Ln: 66 Col: 4
21:14
16/03/2020

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

def determinanHitung(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 = determinHitung(As)
                total += sign * A[0][fc] * sub_det
        else:
            return "Tidak Bisa dihitung Determinan, bukan Matrix Bujursangkar"
    else:
        return "Tidak Bisa dihitung Determinan, bukan Matrix Bujursangkar"
    return total
```

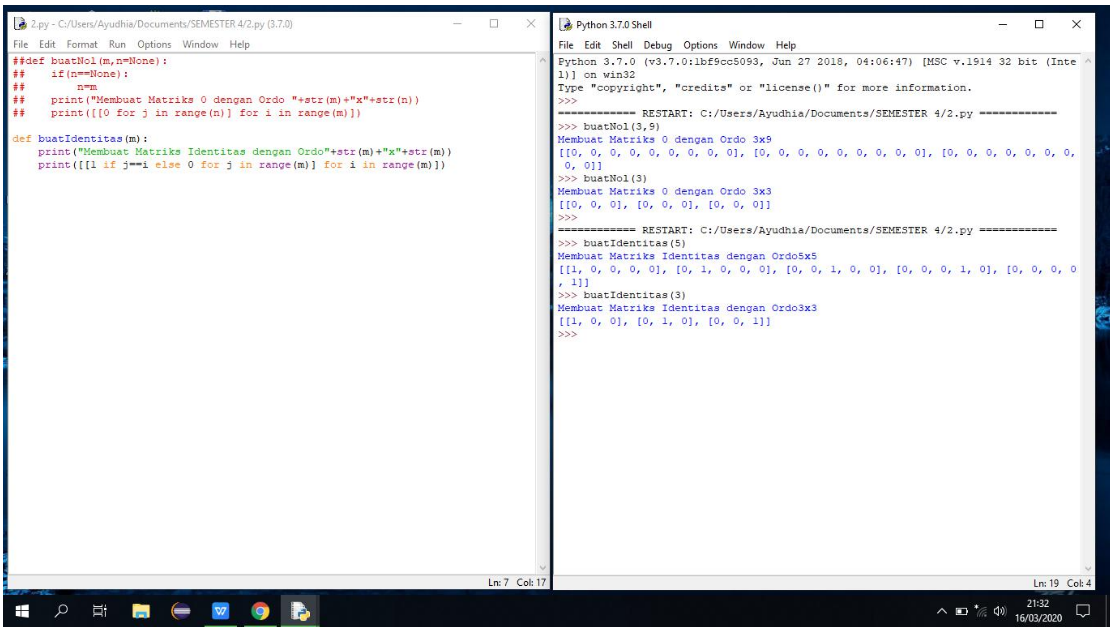
```
'Tidak Bisa dihitung Determinan, bukan Matrix Bujursangkar'
>>> 
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/1.py ============
>>> determinanHitung(d)
'Matrix Bujursangkar'
>>> determinanHitung(e)
'Matrix Bujursangkar'
>>> determinanHitung(a)
-2
>>> 
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/1.py ============
>>> determinanHitung(a)
-2
>>> determinanHitung(b)
-2
>>> determinanHitung(c)
'Tidak Bisa dihitung Determinan, bukan Matrix Bujursangkar'
>>> determinanHitung(d)
'Tidak Bisa dihitung Determinan, bukan Matrix Bujursangkar'
>>> determinanHitung(e)
'Tidak Bisa dihitung Determinan, bukan Matrix Bujursangkar'
```

NO. 2


2.py - C:/Users/Ayudhia/Documents/SEMESTER 4/2.py (3.7.0)
File Edit Format Run Options Window Help
Ln: 7 Col: 0
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Ln: 11 Col: 4
21:30
16/03/2020

```python
def buatNol(m,n=None):
    if(n==None):
        n=m
    print("Membuat Matriks 0 dengan Ordo "+str(m)+"x"+str(n))
    print([[0 for j in range(n)] for i in range(m)])
```

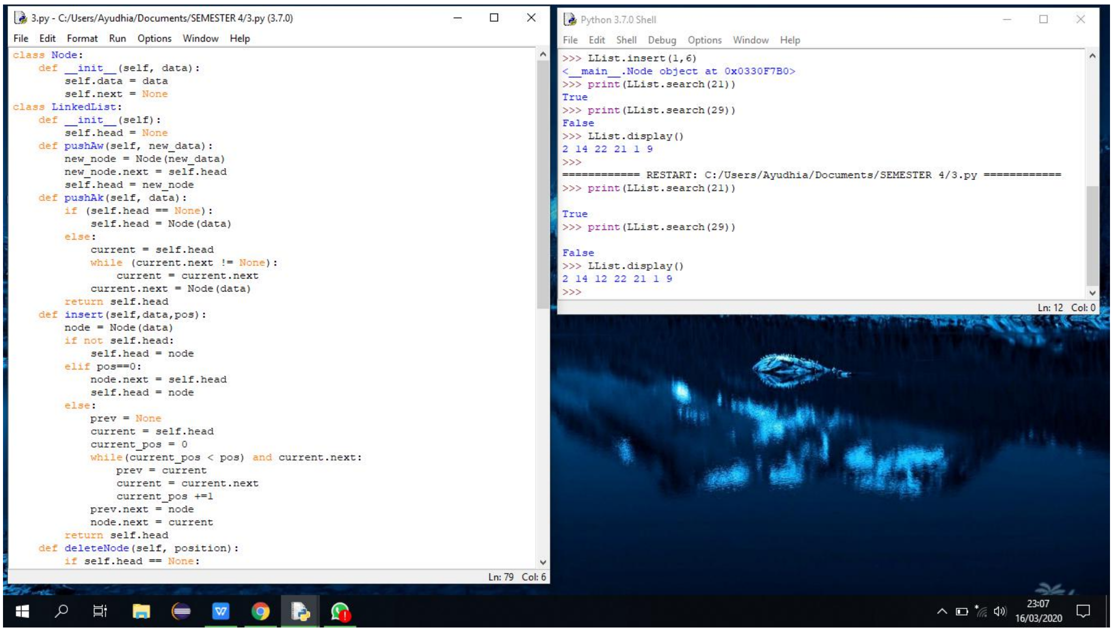
```
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Inte
l)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> 
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/2.py ============
>>> buatNol(3,9)
Membuat Matriks 0 dengan Ordo 3x9
[[0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0,
 0, 0]]
>>> buatNol(3)
Membuat Matriks 0 dengan Ordo 3x3
[[0, 0, 0], [0, 0, 0], [0, 0, 0]]
>>> 
```


2.py - C:/Users/Ayudhia/Documents/SEMESTER 4/2.py (3.7.0)
File Edit Format Run Options Window Help
Ln: 7 Col: 17
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Ln: 19 Col: 4
21:32
16/03/2020

```python
##def buatNol(m,n=None):
##    if(n==None):
##        n=m
##    print("Membuat Matriks 0 dengan Ordo "+str(m)+"x"+str(n))
##    print([[0 for j in range(n)] for i in range(m)])

def buatIdentitas(m):
    print("Membuat Matriks Identitas dengan Ordo"+str(m)+"x"+str(m))
    print([[1 if j==i else 0 for j in range(m)] for i in range(m)])
```

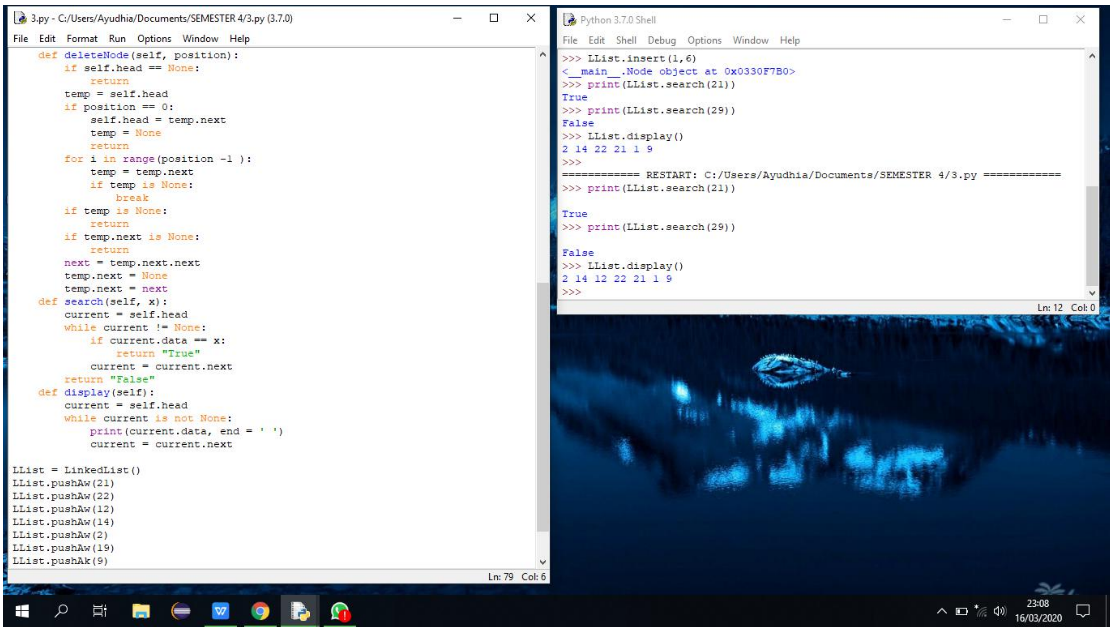
```
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Inte
l)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> 
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/2.py ============
>>> buatNol(3,9)
Membuat Matriks 0 dengan Ordo 3x9
[[0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0, 0, 0], [0, 0, 0, 0, 0, 0, 0,
 0, 0]]
>>> buatNol(3)
Membuat Matriks 0 dengan Ordo 3x3
[[0, 0, 0], [0, 0, 0], [0, 0, 0]]
>>> 
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/2.py ============
>>> buatIdentitas(5)
Membuat Matriks Identitas dengan Ordo5x5
[[1, 0, 0, 0, 0], [0, 1, 0, 0, 0], [0, 0, 1, 0, 0], [0, 0, 0, 1, 0], [0, 0, 0, 0
, 1]]
>>> buatIdentitas(3)
Membuat Matriks Identitas dengan Ordo3x3
[[1, 0, 0], [0, 1, 0], [0, 0, 1]]
>>> 
```

NO. 3


3.py - C:/Users/Ayudhia/Documents/SEMESTER 4/3.py (3.7.0)
File Edit Format Run Options Window Help
Ln: 79 Col: 6
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Ln: 12 Col: 0
23:07
16/03/2020

```
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:
```

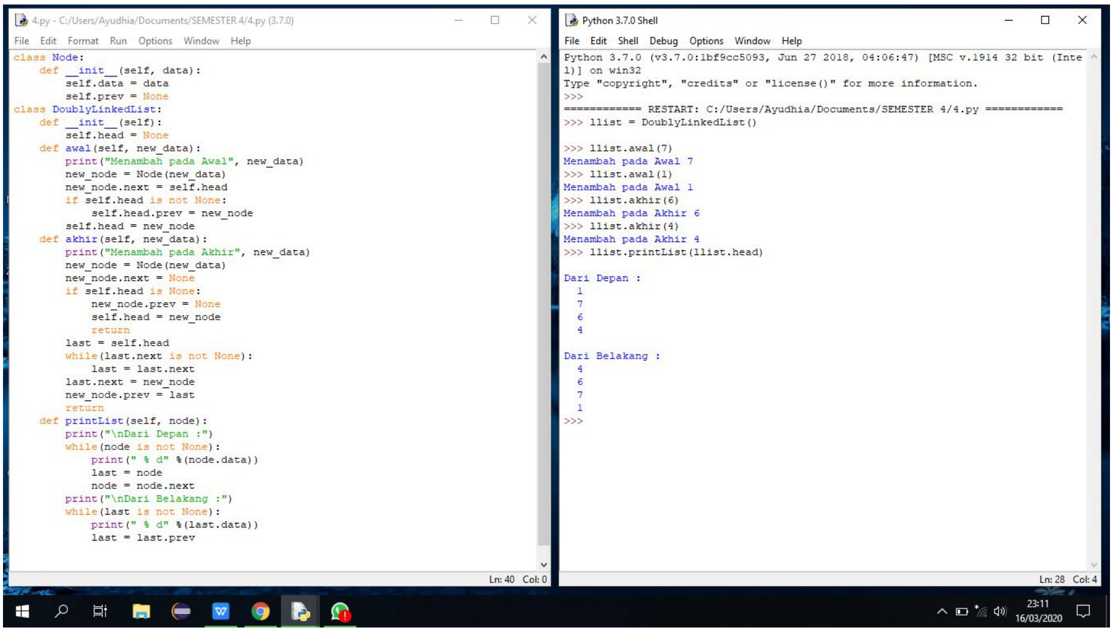
```
>>> LList.insert(1,6)
<__main__.Node object at 0x0330F7B0>
>>> print(LList.search(21))
True
>>> print(LList.search(29))
False
>>> LList.display()
2 14 22 21 1 9
>>>
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/3.py ============
>>> print(LList.search(21))

True
>>> print(LList.search(29))

False
>>> LList.display()
2 14 12 22 21 1 9
>>>
```


3.py - C:/Users/Ayudhia/Documents/SEMESTER 4/3.py (3.7.0)
File Edit Format Run Options Window Help
Ln: 79 Col: 6
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Ln: 12 Col: 0
23:08
16/03/2020

```
    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 = None
        temp.next = next
    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

LList = LinkedList()
LList.pushAw(21)
LList.pushAw(22)
LList.pushAw(12)
LList.pushAw(14)
LList.pushAw(2)
LList.pushAw(19)
LList.pushAk(9)
```

```
>>> LList.insert(1,6)
<__main__.Node object at 0x0330F7B0>
>>> print(LList.search(21))
True
>>> print(LList.search(29))
False
>>> LList.display()
2 14 22 21 1 9
>>>
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/3.py ============
>>> print(LList.search(21))

True
>>> print(LList.search(29))

False
>>> LList.display()
2 14 12 22 21 1 9
>>>
```

NO. 4



4.py - C:/Users/Ayudhia/Documents/SEMESTER 4/4.py (3.7.0)
File Edit Format Run Options Window Help

```python
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 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 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
```

```
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Inte
l)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> 
============ RESTART: C:/Users/Ayudhia/Documents/SEMESTER 4/4.py ============
>>> llist = DoublyLinkedList()

>>> llist.awal(7)
Menambah pada Awal 7
>>> llist.awal(1)
Menambah pada Awal 1
>>> llist.akhir(6)
Menambah pada Akhir 6
>>> llist.akhir(4)
Menambah pada Akhir 4
>>> llist.printList(llist.head)

Dari Depan :
  1
  7
  6
  4

Dari Belakang :
  4
  6
  7
  1
>>> 
```