

**PRAKTIKUM ALGORITMA DAN
STRUKTUR DATA**

Modul 3

Array



Disusun oleh:

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G

PROGRAM STUDI TEKNIK INFORMATIKA

FAKULTAS KOMUNIKASI DAN INFORMATIKA

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SOAL

1. Kode Program

```
nomor1.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 3/nomor1.py (3.8.5)
File Edit Format Run Options Window Help

#DoniWahyuSaputro
#L200200169

A = [[1,2],[3,4],[5,6]]
B = [[7,8],[9,10]]
C = [[3,6],[5,2]]

#Nomor 1A
class matriks (object):
    def cetakmatriks(self, matriks):
        for i in matriks:
            print(i)
    def cekkonsisten(self, matriks):
        if len(matriks[0]) == len(matriks):
            print ("matriks konsisten")
        else:
            print ("matriks tidak konsisten")

x = matriks()
x.cetakmatriks(A)
print(x.cekkonsisten(A))

y = matriks()
y.cetakmatriks(B)
print(y.cekkonsisten(B))

#Nomor 1B
def ordo(matriks):
    return ("Ordo matriks =" +str(len(matriks))+" x "+str(len(matriks[0])))

#Nomor 1C
def Jumlah(matriks1, matriks2):
    if ordo(matriks1) == ordo(matriks2):
        for x in range(0, len(matriks1)):
            for y in range(0, len(matriks1[0])):
                print (matriks1[x][y] + matriks2[x][y], ' '),
            print()
    else:
        print("Matriks tidak sesuai")

#Nomor 1D
def kali(m,n):
    a = 0
    x,y = 0,0
    for i in range(len(m)):
        x += 1
        y = len(m[i])
```

```

v,w = 0,0
for i in range(len(n)):
    v += 1
    w = len(n[i])

if (y == v):
    print ("Bisa Dikalikan")
    vwxy = [[0 for j in range(w)] for i in range(x)]
    for i in range(len(m)):
        for j in range(len(n[0])):
            for k in range(len(n)):
                vwxy[i][j] += m[i][k] * n[k][j]
    print (vwxy)
else:
    print("Tidak memenuhi syarat")

kali(A,B)
kali(B,C)

#Nomor 1E
def determinan(p, total = 0):
    x = len(p[0])
    z = 0
    for i in range(len(p)):
        if (len(p[i]) == x):
            z += 1
    if (z == len(p)):
        if (x == len(p)):
            indices = list(range(len(p)))
            if len(p) == 2 and len(p[0]) == 2:
                val = p[0][0] * p[1][1] - p[1][0] * p[0][1]
                return val
            for fc in indices:
                pq = p
                pq = pq[1:]
                height = len(pq)
                for i in range(height):
                    pq[i] = pq[i][0:fc] + pq[i][fc+1:]
                sign = (-1) ** (fc % 2)
                sub_det = determinanHitung(pq)
                total += sign * A[0][fc] * sub_det
        else:
            return "Tidak bisa dihitung, bukan matriks bujur sangkar"
    else:
        return "Tidak bisa dihitung, bukan matriks bujur sangkar"
    return total

```

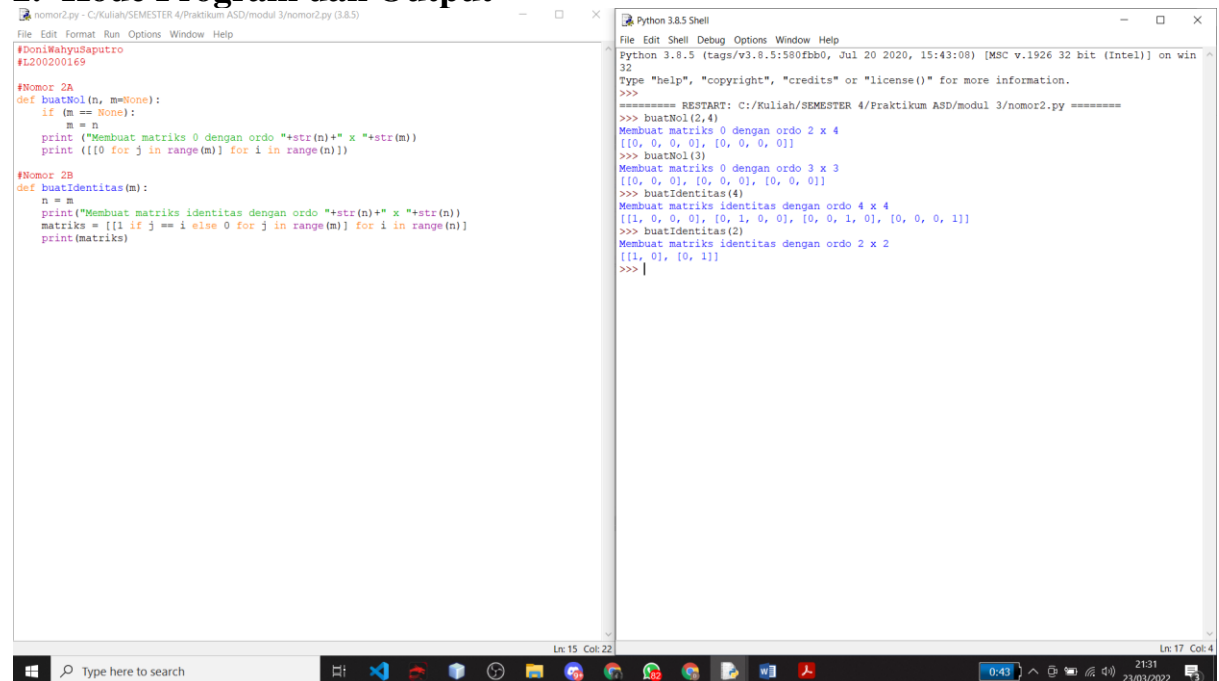
Output

```

Python 3.8.5 Shell
File Edit Shell Debug Options Window Help
[1, 2]
[3, 4]
[5, 6]
matriks tidak konsisten
None
[7, 8]
[9, 10]
matriks konsisten
None
Bisa Dikalikan
[[25, 28], [57, 64], [89, 100]]
Bisa Dikalikan
[[61, 58], [77, 74]]
>>> ordo(A)
'Ordo matriks = 3 x 2'
>>> ordo(b)
Traceback (most recent call last):
  File "<pyshell#1>", line 1, in <module>
    ordo(b)
NameError: name 'b' is not defined
>>> ordo(B)
'Ordo matriks = 2 x 2'
>>> ordo(C)
'Ordo matriks = 2 x 2'
>>> jumlah(A, B)
Matriks tidak sesuai
>>> jumlah(B, C)
10
14
14
12
>>> jumlah(A, C)
Matriks tidak sesuai
>>> kali(A, B)
Bisa Dikalikan
[[25, 28], [57, 64], [89, 100]]
>>> kali(B, C)
Bisa Dikalikan
[[61, 58], [77, 74]]
>>> determinan(A)
'Tidak bisa dihitung, bukan matriks bujur sangkar'
>>> determinan(B)
-2
>>> determinan(C)
-24
Ln 52 Col 4

```

2. Kode Program dan Output



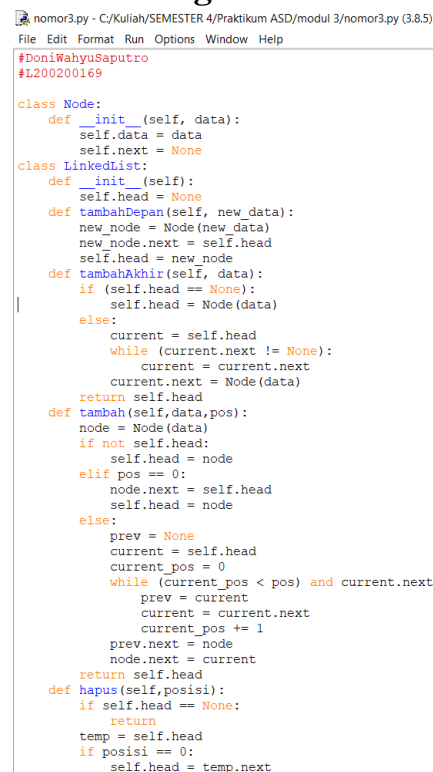
```
nomor2.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 3/nomor2.py (3.8.5)
File Edit Format Run Options Window Help
#DoniWahyuSaputro
#L200200169

#Nomor 2A
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)])

#Nomor 2B
def buatIdentitas(m):
    n = m
    print("Membuat matriks identitas dengan ordo "+str(n)+" x "+str(n))
    matriks = [[1 if j == i else 0 for j in range(m)] for i in range(n)]
    print(matriks)

Python 3.8.5 Shell
File Edit Shell Debug Options Window Help
Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win
32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 3/nomor2.py =====
>>> buatNol(2,4)
Membuat matriks 0 dengan ordo 2 x 4
[[0, 0, 0, 0], [0, 0, 0, 0]]
>>> buatNol(3)
Membuat matriks 0 dengan ordo 3 x 3
[[0, 0, 0], [0, 0, 0], [0, 0, 0]]
>>> buatIdentitas(4)
Membuat matriks identitas dengan ordo 4 x 4
[[1, 0, 0, 0], [0, 1, 0, 0], [0, 0, 1, 0], [0, 0, 0, 1]]
>>> buatIdentitas(2)
Membuat matriks identitas dengan ordo 2 x 2
[[1, 0], [0, 1]]
>>>
```

3.Kode Program



```
nomor3.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 3/nomor3.py (3.8.5)
File Edit Format Run Options Window Help
#DoniWahyuSaputro
#L200200169

class Node:
    def __init__(self, data):
        self.data = data
        self.next = None

class LinkedList:
    def __init__(self):
        self.head = None
    def tambahDepan(self, new data):
        new_node = Node(new data)
        new_node.next = self.head
        self.head = new_node
    def tambahAkhir(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 tambah(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 hapus(self, posisi):
        if self.head == None:
            return
        temp = self.head
        if posisi == 0:
            self.head = temp.next
```

```

        temp = None
        return
    for i in range(posisi - 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 cari(self,x):
    current = self.head
    while current != None:
        if current.data == x:
            print(x, "Apakah ada dalam data?")
            return True
        current = current.next
    print(x,"Apakah ada dalam data?")
    return False
def display(self):
    current = self.head
    while current is not None:
        print(current.data, end = ' ')
        current = current.next

```

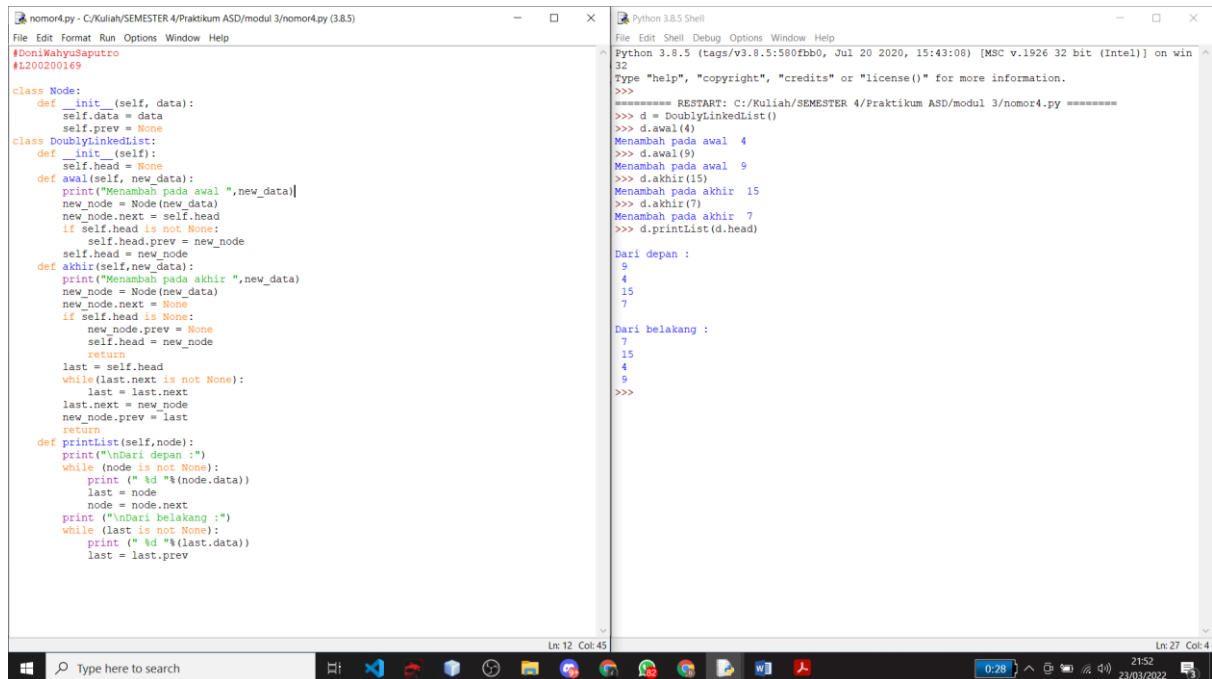
Output

```

Python 3.8.5 Shell
File Edit Shell Debug Options Window Help
Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 3/nomor2.py =====
>>> buatNol(2,4)
Membuat matriks 0 dengan ordo 2 x 4
[[0, 0, 0, 0], [0, 0, 0, 0]]
>>> buatNol(3)
Membuat matriks 0 dengan ordo 3 x 3
[[0, 0, 0], [0, 0, 0], [0, 0, 0]]
>>> buatIdentitas(4)
Membuat matriks identitas dengan ordo 4 x 4
[[1, 0, 0, 0], [0, 1, 0, 0], [0, 0, 1, 0], [0, 0, 0, 1]]
>>> buatIdentitas(2)
Membuat matriks identitas dengan ordo 2 x 2
[[1, 0], [0, 1]]
>>>
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 3/nomor3.py =====
>>> A = LinkedList()
>>> A.tambahDepan(10)
>>> A.tambahDepan(25)
>>> A.tambahDepan(40)
>>> A.tambahAkhir(15)
<_main__._Node object at 0x03668118>
>>> A.hapus(0)
>>> A.tambah(5,4)
<_main__._Node object at 0x036680D0>
>>> print(A.cari(40))
40 Apakah ada dalam data?
False
>>> print(A.cari(10))
10 Apakah ada dalam data?
True
>>> print(A.cari(15))
15 Apakah ada dalam data?
True
>>> |

```

4. Kode Program dan Output



The image shows a screenshot of a Python IDE with two windows. The left window, titled 'nomor4.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 3/nomor4.py (3.8.5)', contains the following Python code:

```
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
        else:
            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
```

The right window, titled 'Python 3.8.5 Shell', shows the execution output:

```
Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 3/nomor4.py =====
>>> d = DoublyLinkedList()
>>> d.awal(4)
Menambah pada awal 4
>>> d.awal(9)
Menambah pada awal 9
>>> d.akhir(15)
Menambah pada akhir 15
>>> d.akhir(7)
Menambah pada akhir 7
>>> d.printList(d.head)

Dari depan :
9
4
15
7

Dari belakang :
7
15
4
9
>>>
```

The taskbar at the bottom shows the Windows search bar, taskbar icons, and system tray with the time 0:28 and date 23/03/2022.