ALGORITHM AND DATA STRUCTURE PRACTICUM

MODULE 7

REGULAR EXPRESSIONS

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Experimen 8.3

```
class Stack:
    def __init__(self):
        self.items = []

    def isEmpty(self):
        return len(self) == 0

    def __len__(self):
        return len(self.items)
    def peek(self):
        assert not self.isEmpty()
        return self.items[-1]
    def pop(self):
        assert not self.isEmpty()
        return self.items.pop()
    def push(self, data):
        self.items.append(data)
class StackLL:
    def __init__(self):
        self.top = None
        self.size = 0
    def isEmpty(self):
        return self.top is None
    def __len__(self):
        return self.size

    def peek(self):
        assert not self.isEmpty()
        return self.top.item
    def pop(self):
        assert not self.isEmpty()
        node = self.top
        self.top = self.top.next
        self.size -= 1
        return node.item
    def push(self):
        self.top = _StackNode(data, self.top)
        self.size += 1
class _StackNode:
    def __init__(self, data, link):
        self.item = data
        self.next = link
##PROMPT = "Masukkan bilangan positif (<0 untuk mengakhiri) :
"
```

```
##myStack = Stack()
##value = int(input(PROMPT))
##while value >= 0:
##    myStack.push(value)
##    value = int(input(PROMPT))
##while not myStack.isEmpty():
##    value = myStack.pop()
##    print(value)
9
```

Experimen 8.4

```
from latihan83 import Stack
def cetakBiner(d):
    f = Stack()
    if d==0: f.push(0);
    while d !=0:
        sisa = d%2
        d = d//2
        f.push(sisa)
    st = ""
    for i in range(len(f)):
        st = st + str(f.pop())
    return st

print(cetakBiner(11))
print(cetakBiner(53))
```

```
Python 3.7.9 (bundled)
>>> %Run latihan83.py
>>> %Run latihan84.py
 1011
 110101
>>> %Run latihan84.py
 1011
 110101
>>>
```

Experimen 8.6

```
class Queue(object):
    def __init__(self):
        self.qlist = []

    def isEmpty(self):
        return len(self) == 0

    def __len__(self):
        return len(self.qlist)

    def enqueue(self, data):
        self.qlist.append(data)
```

```
    def dequeue(self):
        assert not self.isEmpty(), "Antrian sedang kosong"
        return self.qlist.pop(0)
Q = Queue()
Q.enqueue(28)
Q.enqueue(19)
Q.enqueue(45)
Q.enqueue(13)
Q.enqueue(7)
print(Q.qlist)
Q.dequeue()
Q.dequeue()
Q.dequeue()
Q.dequeue()
Q.dequeue()
print(Q.qlist)
Q.enqueue(98)
Q.enqueue(54)
Q.dequeue()
print(Q.qlist)
```

```
>>> %Run 86.py
[28, 19, 45, 13, 7]
[]
[54]
>>>
```

Experimen 8.7

```
class PriorityQueue(object):

    def __init__(self):
        self.qlist = []
    def __len__(self):
        return len(self.qlist)

    def isEmpty(self):
        return len(self) == 0

    def enqueue(self, data, priority):
        entry = _PriorityQEntry(data, priority)
        self.qlist.append(entry)

    def dequeue(self):
        pass
class _PriorityQEntry(object):

    def __init__(self, data, priority):
```

```
        self.item = data
        self.priority = priority
    def __str__(self):
        return 'Item: {}\nPriority: {}'.format(self.item,
self.priority)
S = PriorityQueue()
S.enqueue('Jeruk', 4)
S.enqueue('Tomat', 2)
S.enqueue('Mangga', 0)
S.enqueue('Duku', 5)
S.enqueue('Papaya', 2)
for i in S.qlist:
    print(i)
S.dequeue()
S.dequeue()
S.dequeue()
for i in S.qlist:
    print(i)
```

```
[54]
>>> %Run latihan87.py
Item: Jeruk
Priority: 4
Item: Tomat
Priority: 2
Item: Mangga
Priority: 0
Item: Duku
Priority: 5
Item: Papaya
Priority: 2
Item: Jeruk
Priority: 4
Item: Tomat
Priority: 2
Item: Mangga
Priority: 0
Item: Duku
Priority: 5
Item: Papaya
Priority: 2
>>>
```

TASK 1

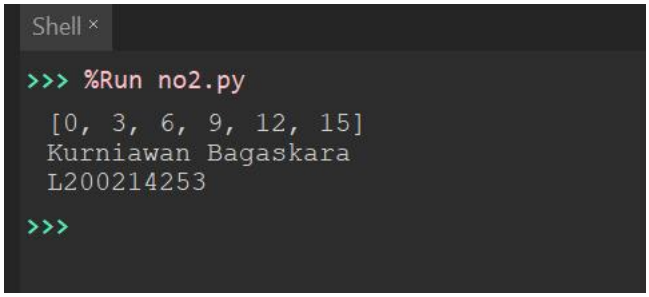
```
class Stack(object):
    def __init__(self):
        self.items = []

    def isEmpty(self):
        return len(self) == 0

    def __len__(self):
        return len(self.items)

    def peek(self):
        assert not self.isEmpty(), "Tidak bisa diintip. Stack kosong"
        return self.items[-1]

    def pop(self):
        assert not self.isEmpty(), "Tidka bisa dipop dari Stack kosong"
        return self.items.pop()

    def push(self, data):
        self.items.append(data)

def cetakHexa(d):
    f = Stack()
    if d == 0: f.push(0);
    while d != 0:
        sisa = d%16
        d = d//16
```

```
        if sisa == 10:
            sisa = "A"
        elif sisa == 11:
            sisa = "B"
        elif sisa == 12:
            sisa = "C"
        elif sisa == 13:
            sisa = "D"
        elif sisa == 14:
            sisa = "E"
        elif sisa == 15:
            sisa = "F"
        f.push(sisa)
    st = ""
    for i in range (len(f)):
        st = st + str(f.pop())
    return st

print ("Kurniawan Bagaskara")
print ("L200214253")
```

TASK 2

```
class Stack(object):
    def __init__(self):
        self.items = []

    def isEmpty(self):
        return len(self) == 0

    def __len__(self):
        return len(self.items)

    def peek(self):
        assert not self.isEmpty(), "Tidak bisa diintip. Stack kosong"
        return self.items[-1]
```

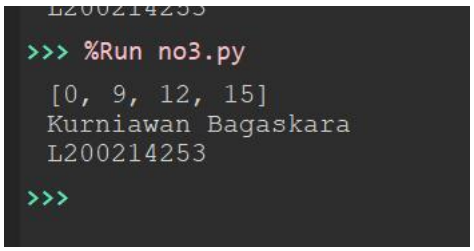
```
    def pop(self):
        assert not self.isEmpty(), "Tidak bisa dipop dari Stack kosong"
        return self.items.pop()

    def push(self, data):
        self.items.append(data)

nilai = Stack()
for i in range(16):
    if i%3 == 0:
        nilai.push(i)
print(nilai.items)
print ("Kurniawan Bagaskara")
print ("L200214253")
```



TASK 3

```
class Stack(object):
    def __init__(self):
        self.items = []

    def isEmpty(self):
        return len(self) == 0

    def __len__(self):
```

```
        return len(self.items)

    def peek(self):
        assert not self.isEmpty(), "Tidka bisa diintip. Stack kosong"
        return self.items[-1]

    def pop(self):
        assert not self.isEmpty(), "Tidka bisa dipop dari Stack kosong"
        return self.items.pop()

    def push(self, data):
        self.items.append(data)

nilai = Stack()
for i in range (16):
    if i%3 == 0:
        nilai.push(i)
    elif i%4 == 0:
        nilai.pop()
print(nilai.items)
print ("Kurniawan Bagaskara")
print ("L200214253")
```



TASK 4

```
class Queue(object):
```

```
    def __init__(self):
        self.qlist = []
    def isEmpty(self):
        return len(self) == 0
    def __len__(self):
        return len(self.qlist)
    def enqueue(self, data):
        self.qlist.append(data)
    def dequeue(self):
        assert not self.isEmpty(), "Antrian sedang kosong"
        return self.qlist.pop(0)
    def getFrontMost(self):
        return self.qlist[0]
    def getRearMost(self):
        return self.qlist[-1]

class PriorityQueue(object):
    def __init__(self):
        self.qlist = []
    def isEmpty(self):
        return len(self) == 0
    def __len__(self):
        return len(self.qlist)
    def enqueue(self, data, priority):
        entry = _PriorityQEntry(data, priority)
        self.qlist.append(entry)
    def getFrontMost(self):
        x = 0
        while self.qlist[x].priority != 0:
            x+=1
```

```
        return self.qlist[x].item
    def getRearMost(self):
        a = []
        for i in self.qlist:
            a.append(i.priority)
        print (self.qlist[a.index(max(a))].item)

class _PriorityQEntry(object):
    def __init__(self, data, priority):
        self.item = data
        self.priority = priority

A = Queue()
A.enqueue(28)
A.enqueue(19)
A.enqueue(45)
A.enqueue(13)
A.enqueue(7)

S = PriorityQueue()
S.enqueue("Jeruk", 4)
S.enqueue("Tomat", 2)
S.enqueue("Mangga", 0)
S.enqueue("Duku", 5)
S.enqueue("Pepaya", 2)
print ("Kurniawan Bagaskara")
print ("L200214253")
```

TASK 5

```
class PriorityQueue(object):
    def __init__(self):
        self.qlist = []

    def isEmpty(self):
        return len(self) == 0

    def __len__(self):
        return len(self.qlist)

    def enqueue(self, data, priority):
        entry = _PriorityQEntry(data, priority)
        self.qlist.append(entry)

    def dequeue(self):
        assert not self.isEmpty(), "Antrian sedang kosong"
        a = []
        for i in self.qlist:
            a.append(i.priority)
        print (self.qlist.pop(a.index(min(a))).item)

class _PriorityQEntry(object):
    def __init__(self, data, priority):
        self.item = data
        self.priority = priority

S = PriorityQueue()
S.enqueue("Jeruk", 4)
S.enqueue("Tomat", 2)
```

```
S.enqueue("Mangga", 0)
S.enqueue("Duku", 4)
S.enqueue("Pepaya", 2)
print ("Kurniawan Bagaskara")
print ("L200214253")
```