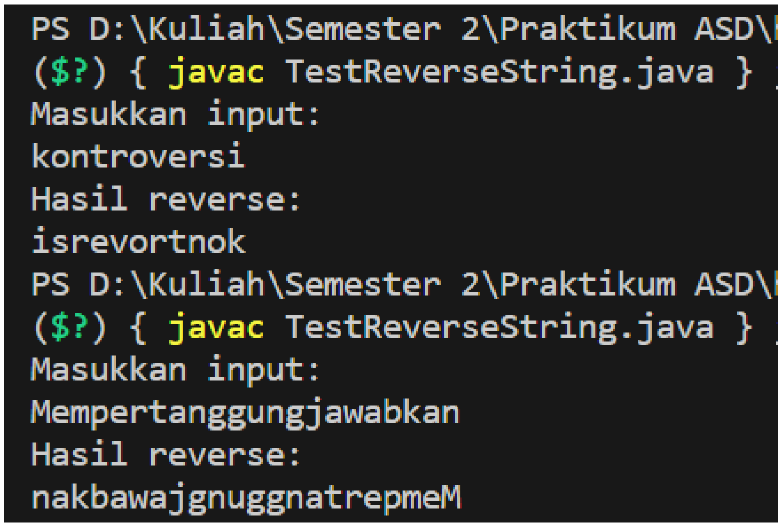
Ahmad Siddiq Priaji (22/496854/PA/21370)

Homework 7

1. Tugas nomor 1 dan 2
   1) TestReverseString.java

```java
import java.util.*;
public class TestReverseString {
    public static void main(String[] args) {
        String kata;
        Stack<Character> stack = new Stack<>();
        Scanner input = new Scanner(System.in);
        System.out.println("Masukkan input: ");
        kata = input.next();

        for (int i = 0; i < kata.length(); i++) {
            char c = kata.charAt(i);
            stack.push(c);
        }
        System.out.println("Hasil reverse: ");
        while (!stack.isEmpty()) {
            char c = stack.pop();
            System.out.print(c);
        }
        input.close();
    }
}
```

Hasil:

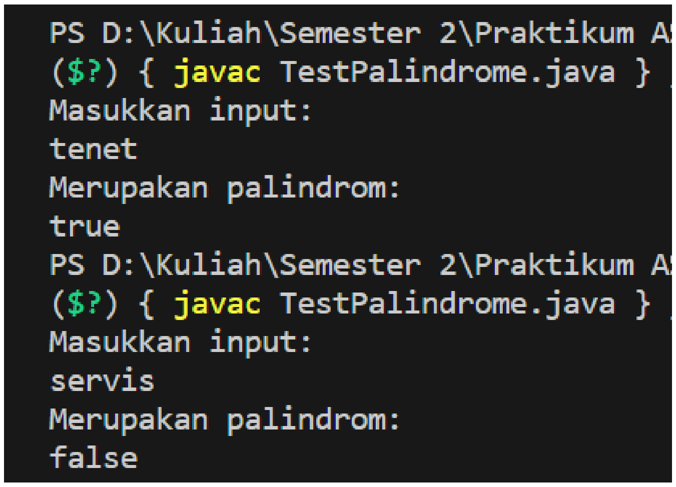


```
PS D:\Kuliah\Semester 2\Praktikum ASD\
($?) { javac TestReverseString.java }
Masukkan input:
kontroversi
Hasil reverse:
isrevortnok
PS D:\Kuliah\Semester 2\Praktikum ASD\
($?) { javac TestReverseString.java }
Masukkan input:
Mempertanggungjawabkan
Hasil reverse:
nakbawajgnuggnatrepmeM
```

2) TestPalindrome.java

```java
import java.util.*;
public class TestPalindrome {
    public static void main(String[] args) {
        String kata;
        Stack<Character> stack = new Stack<>();
        Scanner input = new Scanner(System.in);
        System.out.println("Masukkan input: ");
        kata = input.next();

        for (int i = 0; i < kata.length(); i++) {
            char c = kata.charAt(i);
            stack.push(c);
        }
        boolean isPalindrom = false;
        for (int i = 0; i < kata.length(); i++) {
            if (kata.charAt(i) == stack.pop()) {
                isPalindrom = true;
            }
            else {
                isPalindrom = false;
                break;
            }
        }
        System.out.println("Merupakan palindrom: ");
        System.out.println(isPalindrom);
        input.close();
    }
}
```

Hasil:



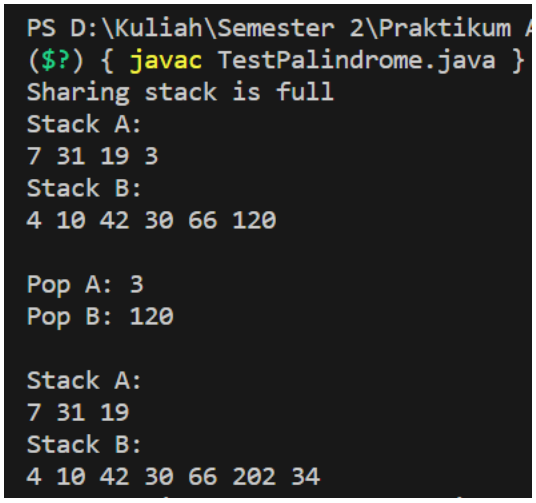
```
PS D:\Kuliah\Semester 2\Praktikum A
($?) { javac TestPalindrome.java }
Masukkan input:
tenet
Merupakan palindrom:
true
PS D:\Kuliah\Semester 2\Praktikum A
($?) { javac TestPalindrome.java }
Masukkan input:
servis
Merupakan palindrom:
false
```

2. Sharing Stack

SharingStack.java

```java
public class SharingStack {
    int maxSize;
    int[] stackArray; // membuat satu array
    int topA;
    int topB;
    boolean isFull;

    public SharingStack(int s) {
        maxSize = s;
        stackArray = new int[maxSize];
        topA = -1; // indeks awal stack A
        topB = maxSize; // indeks awal stack B
        isFull = false;
    }

    public void pushA(int j) { // menaruh data stack A dari depan array
        if (topA < topB-1){
            stackArray[++topA] = j;
        }
        else {
            isFull = true;
        }
    }

    public void pushB(int j) {  // menaruh data stack B dari belakang array
        if (topA < topB-1) {
            stackArray[--topB] = j;
        }
        else {
            isFull = true;
        }
    }

    public int popA() {
        int temp = stackArray[topA--];
        if (topA < topB-1) {
            isFull = false;
        }
        if (topA == -1) {
            System.out.println("Stack A is empty");
            return -1;
        }
        return temp;
    }

    public int popB() {
        int temp = stackArray[topB++];
        if (topA < topB-1) {
            isFull = false;
        }
        if (topB == maxSize) {
            System.out.println("Stack B is empty");
            return -1;
        }
        return temp;
    }

    public void printStack() {
        if (isFull) {
            System.out.println("Sharing stack is full");
        }
        System.out.println("Stack A: ");
        for (int i = 0; i <= topA; i++) {
            System.out.print( stackArray[i] + " ");
        }
        System.out.println();
        System.out.println("Stack B: ");
        for (int i = stackArray.length-1; i >= topB; i--) {
            System.out.print( stackArray[i] + " ");
        }
        System.out.println();
    }

    public static void main(String[] args) {
        SharingStack theStack = new SharingStack(10);
        theStack.pushA(7);
        theStack.pushA(31);
        theStack.pushA(19);
        theStack.pushA(3);

        theStack.pushB(4);
        theStack.pushB(10);
        theStack.pushB(42);
        theStack.pushB(30);
        theStack.pushB(66);
        theStack.pushB(120);
        theStack.pushB(200); // stack penuh, tidak tersimpan
        theStack.pushB(72); // stack penuh, tidak tersimpan

        theStack.printStack();
        System.out.println();

        System.out.println("Pop A: " + theStack.popA());
        System.out.println("Pop B: " + theStack.popB());
        theStack.pushB(202);
        theStack.pushB(34);
        System.out.println();
        theStack.printStack();
    }
}
```

Hasil:

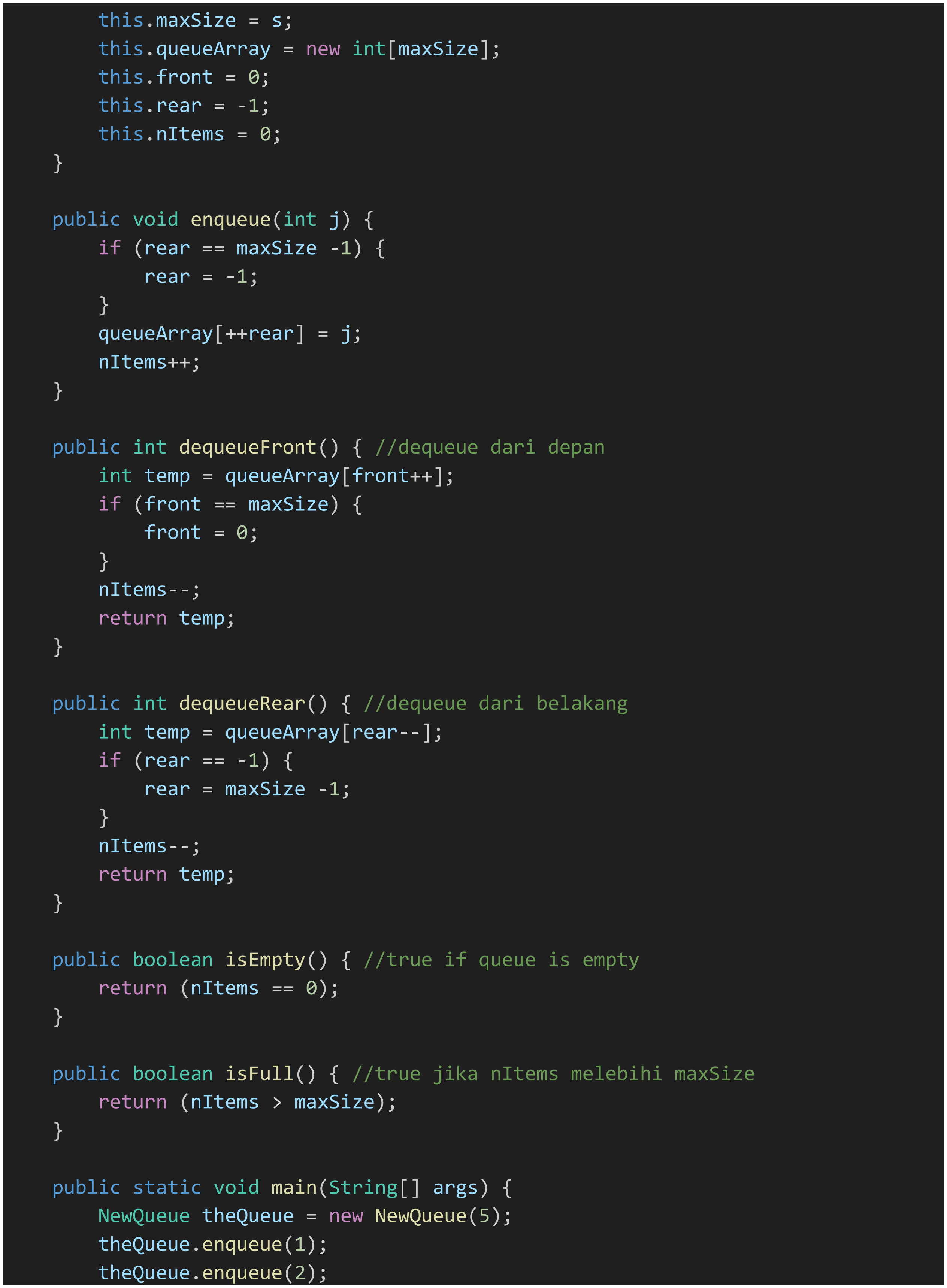


```
PS D:\Kuliah\Semester 2\Praktikum A
($?) { javac TestPalindrome.java }
Sharing stack is full
Stack A:
7 31 19 3
Stack B:
4 10 42 30 66 120

Pop A: 3
Pop B: 120

Stack A:
7 31 19
Stack B:
4 10 42 30 66 202 34
```

3. New Queue

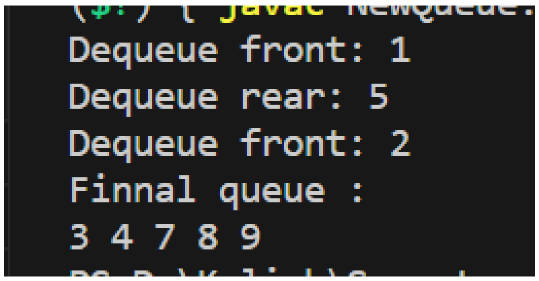
NewQueue.java

```
public class NewQueue {
    int maxSize;
    int[] queueArray;
    int front;
    int rear;
    int nItems;

    public NewQueue(int s) {
```



```java
        this.maxSize = s;
        this.queueArray = new int[maxSize];
        this.front = 0;
        this.rear = -1;
        this.nItems = 0;
    }

    public void enqueue(int j) {
        if (rear == maxSize -1) {
            rear = -1;
        }
        queueArray[++rear] = j;
        nItems++;
    }

    public int dequeueFront() { //dequeue dari depan
        int temp = queueArray[front++];
        if (front == maxSize) {
            front = 0;
        }
        nItems--;
        return temp;
    }

    public int dequeueRear() { //dequeue dari belakang
        int temp = queueArray[rear--];
        if (rear == -1) {
            rear = maxSize -1;
        }
        nItems--;
        return temp;
    }

    public boolean isEmpty() { //true if queue is empty
        return (nItems == 0);
    }

    public boolean isFull() { //true jika nItems melebihi maxSize
        return (nItems > maxSize);
    }

    public static void main(String[] args) {
        NewQueue theQueue = new NewQueue(5);
        theQueue.enqueue(1);
        theQueue.enqueue(2);
        theQueue.enqueue(3);
        theQueue.enqueue(4);
        theQueue.enqueue(5);
        // queue awal: [1, 2, 3, 4, 5]

        System.out.println("Dequeue front: "+theQueue.dequeueFront());
        System.out.println("Dequeue rear: "+theQueue.dequeueRear());
        System.out.println("Dequeue front: "+theQueue.dequeueFront());

        theQueue.enqueue(7);
        theQueue.enqueue(8);
        theQueue.enqueue(9);

        System.out.println("Finnal queue : ");
        if (!theQueue.isFull()) { //mengeluarkan semua data queue
            while (!theQueue.isEmpty()) {
                System.out.print(theQueue.dequeueFront() + " ");
            }
            System.out.println();
        }
        else {
            System.out.println("Queue is full");
        }
    }
}
```

Hasil:



```
Dequeue front: 1
Dequeue rear: 5
Dequeue front: 2
Finnal queue :
3 4 7 8 9
```