# COE528 (Fall 2019)

# Lab2

**General Lab Rule**

* **Lab attendance is mandatory and will be recorded weekly**. You lose 10% of the lab mark if you do not attend the lab sessions. (For a lab with two sessions, it means that if you do not attend both sessions and for a lab with one session, it means that if you do not attend the only one session).
* **Due date: 11:59pm, Monday of the week of the scheduled lab 3 session.**
  + The penalty for up to 8 hours delay in submission is 20% of your mark
  + No acceptance after 8 hours delay
* All the necessary files of this lab should be in lab2 directory. Please zip lab12 directory before submission
* You must include the duly filled and signed standard cover page with your submission. The cover page can be found on the departmental web site: [Standard Assignment/Lab Cover Page](http://www.ee.ryerson.ca/guides/Standard_Cover_Page_Assignments.pdf)

All the java files in this lab should have the following package declaration:

package coe528.lab2;

**Duration: one week.**

## Objective

* Implement and specify procedures with Requires, Modifies and Effects clauses.

The specification for a procedural abstraction contains:

(a) **Requires:** This clause states any constraints under which the procedure will work.

This is an optional clause.

(b) **Modifies:** This clause lists the names of any inputs that are modified by the procedure.

This is an optional clause.

(c) **Effects:** This clause describes the behaviour of the procedure for all inputs that are

not ruled out by the Requires clause.

# Ex1: Specification for substituteMax procedure

In the lab2 directory, create a text file named Ex1.txt. Copy the code provided below for the substituteMax method to the file Ex1.txt. Next, in the file Ex1.txt, write the specification (i.e. provide the necessary clause(s) out of the three clauses Requires, Modifies, Effects as relevant)corresponding to the code for substituteMax method.

//Requires: <**Write the Requires clause here**>

//Modifies: <**Write the Modifies clause here**>

//Effects: <**Write the Effects clause here**>

public static void substituteMax(int[] a, int[] b) {

int maxOfA = a[0];

int index = 0;

for (int i = 0; i < a.length; i++) {

if(a[i] > maxOfA) {

maxOfA = a[i];

index = i;

}

}

int maxOfB = b[0];

for (int i = 0; i < b.length; i++) {

if(b[i] > maxOfB) {

maxOfB = b[i];

}

}

a[index] = maxOfB;

}

# Ex2: Specification and Implementation for isPalindrome procedure

In the Netbeans program, click on Project > New Project and save it as "Ex2" on your lab2 directory.

Create a new class called Palindrome. In this class:

       Specify (i.e. provide the necessary clause(s) out of the three clauses Requires, Modifies, Effects as relevant) and implement a procedure called isPalindrome that determines whether or not a string is a palindrome. (A palindrome reads the same backward and forward; an example is “deed”.) This method should be public and static, and take a single string parameter as follows. The method should return true if the specified string is a palindrome and false otherwise.

//Requires: <**Write the Requires clause here**>

//Modifies: <**Write the Modifies clause here**>

//Effects: <**Write the Effects clause here**>

public static boolean isPalindrome(String a) {

**//write the code for isPalindrome**

}

         **Copy** the main method for the class Palindrome as follows:

public static void main(String[] args) {

if(args.length == 1) {

if (args[0].equals("1"))

System.out.println(isPalindrome(null));

else if (args[0].equals("2"))

System.out.println(isPalindrome(""));

else if (args[0].equals("3"))

System.out.println(isPalindrome("deed"));

else if (args[0].equals("4"))

System.out.println(isPalindrome("abcd"));

}

}

If the main method is run with the command line arguments, the console should show relevant output. Each command line argument and the corresponding output is shown below.

|  |  |
| --- | --- |
| Command line argument | Output |
| 1 | False |
| 2 | False |
| 3 | True |
| 4 | False |

// Command line arguments means Scanner