**Lab 1: Program Structure in Java and Structure Programming
Revision**

**Objectives**

* To understand the layout and the structure of a simple Java program
* To be introduced to the Eclipse debugger - an important tool for finding and fixing run-time errors - as well as some of the features that Eclipse provides to help you avoid compile-time errors.
* To be able to write simple Java application using output and input streams.
* To become familiar with primitive data types.
* To become familiar with the conditional statements in Java (i.e. **if, if else, switch**).
* To become familiar with the control structures in Java ( i.e. **while, for, do while**).

**Simple Java Program**

This program will allow you to understand the layout to Java Programs. In addition , to the meaning of the following expressions in Java:

***Package, Class, Method, Modifier***

// Text printing program – First lab

package lab1;

public class Hello {

 // main method begins execution of Java application

 public static void main(String argv[]){

System.out.println("Welcome to comp231 – Object oriented programming course ");

 } // end method

 } // end class Welcome

 **Eclipse Debugger**

This lab will introduce you to Eclipse, a full-featured and very versatile Integrated Development Environment. During the assignments and labs in this course you will be using Eclipse extensively to develop Java programs.All of your work done in each lab and assignment throughout the course should be stored in your account.

* Create the directory /comp231. This will be the root directory for everything done in this course.
* Create the subdirectory /comp231/lab number, which will store all of you work for the current lab.

**Exercises**

1. Write an application that produces a cover sheet for your laboratory assignments. It should have the laboratory number, the tasks that have been assigned, your instructor’s name, your name, the date, and any other information that your instructor has requested.
2. Write an application that writes a birthday message to your mother. Surround the message with asterisks.
3. Write an application that reads in a person name and writes a birthday message to the person.
4. The body mass index (BMI) is a ratio of person’s weight and height. The index can be used to determine if a weight is unhealthy for certain height. Here is the non-metric formula:

 BMI = weight \* 703/ height\*height

Write an application that reads in values for weight and height and prints out the BMI index. Your application should prints on the screen an interpretation of the BMI. Use the following scale.

|  |  |
| --- | --- |
| BMI | Interpretation |
| Under 16 | Emaciated |
| 16-19 | Underweight |
| 20-25 | Normal |
| 26-30 | Overweight |
| Over 30 | Obese |

1. Write a class that contains the following two methods:

/\*\* Converts from Celsius to Fahrenheit \*/

public static double celsiusToFahrenheit(double celsius)

/\*\* Converts from Fahrenheit to Celsius \*/

public static double fahrenheitToCelsius(double fahrenheit)

The formula for the conversion is:

fahrenheit = (9.0 / 5) \* celsius + 32

Write a test program that invokes these methods to display the following tables:

Celsius Fahrenheit Fahrenheit Celsius

 40.0 105.0 120.0 48.89

 39.0 102.2 110.0 43.33

 ...

 32.0 89.6 40.0 5.44

 31.0 87.8 30.0 -1.11