**CS1401 – Programming Assignment 5**

**Due: March 1, 2015 by 11:59pm**

**To be submitted via Piazza in the folder “lab5”**

**Welcome to Lab 5!**

This week, you are going to realize how much you’ve progressed! You are going to review all skills studied and practiced so far:

* Input / output, including writing in a file
* Loops: for and while
* If statements / switch
* Strings

Do make sure that you follow instructions. This starts by using the java file that is provided to you and just filling in the blank where specified. This also includes turning in all that is expected from you: look for “To be turned in” instructions in this document.

**Before you start:** starting with this lab, we are requesting that you turn in your lab in the following format:

* Put all your files (java file, docx file) in a folder name after your last name followed by your first name
* Compress this folder into a .zip file (nothing else than a .zip)
* Submit the .zip file

**Tips of the week!**

1. Make sure that you read carefully all instructions and all details of each activity.
2. Never start coding without writing pseudocode before!

Now, let’s get you started! Here are the three activities you will be working on. Have fun!

**Activity 1.** In this activity, you will design a little loan calculator, **creditComputation**, that receives from the user:

* the amount of money the user borrowed;
* the loan yearly rate; and
* the duration of the loan in years (this can only be in full years, so this amount is an integer);

and returns:

* the total amount of money that the user will have paid by the end of the loan duration (output should only include a 2-digit precision real number); and
* the difference between the amount borrowed and the amount paid (output should only include a 2-digit precision real number).

While doing so, make sure that your code includes the use of a “for” loop.

To be turned in:

* Your pseudocode (in a docx file – the same for the whole lab)
* Your code (the java file): well indented, well commented
* The tracing of your code where the user borrows $150K at a 5.5% yearly rate (in a docx file – the same for the whole lab)

**Activity 2.**  In this activity, you will design a studying companion that will check on what you are reading and will keep prompting you until you have mastered the content of your reading. Your implementation of **readingCompanion** will go as follows:

1. Prompt the user to enter the title of the lecture s/he is studying
2. If the title is longer than 50 characters, output “This must be a hard topic!” ☺

Otherwise: output “Ok, let me know when you are done studying”

1. Ask the user if the lesson is already fully understood
2. If it is: output “Ok, good job! Onto the next lecture!”

Otherwise: output “Ok, I will check on your progress later!”

1. Keep asking while the lecture has not been completely mastered.
2. And while the lecture has not been mastered: output “Hang in there!”
3. Once it is mastered, output “Good job!”

While you do this, make sure that you implementation includes a “while” loop and uses Strings.

To be turned in:

* Your pseudocode (in a docx file – the same for the whole lab)
* Your code (the java file): well indented, well commented
* The tracing of your code where the user enters the following:
  + Lecture title: “CS1401 – An Introduction to Java Programming and More”
  + Answers “No” five times before the lesson is fully mastered

**Activity 3.** In this activity, you will handle two strings and check for how similar they are. To do so, you will do the following:

* Ask the user for his/her first name and last name: retrieve and store this information
* Ask the user if s/he wants to input information in metric or US
* Once the measurement system has been chosen, prompt the user and receive input from him/her about:
  + Height in cm or in depending on prior choice
  + Weight in kg or lbs depending on prior choice
* Return the BMI of this person (look up the metric and US formulae)
* Depending on the BMI value, output a relevant message
* Print all the personal information you have received from and computed for the user, including his/her preference of metric vs US system, in a .txt file named after the user’s first and last name.

In your program, make sure that you use at least an “if” statement AND a “switch” statement.

Hints about creating a file:

1. You will **use “PrintWriter”** as you did in lab3.
2. The following instruction results in creating the file called “filename”:

PrintWriter writer = new PrintWriter("the-file-name.txt", "UTF-8");

“filename” is a String. You can **change “filename”** in the code **for any string that fits your needs**.

1. In particular, what you are expected to do in this little program is to create a text file that is **named after the last name and first name of the user**; e.g., CeberioMartine.txt.

Think about creating a String the contains, e.g., CeberioMartine.txt.

To be turned in:

* Your pseudocode of **healthCompanion** (in the same docx file as previous activities)
* Your code (the java file lab5.java in which you inserted your code): well indented, well commented
* The tracing of your code where the user enters the following:
  1. Your first name
  2. Your last name
  3. Your measuring system preference
  4. Your weight and height