CSCI 1320 Computer Science I: Engineering Applications Fall 2018
Instructor: Zagrodzki
Assignment 7
Due Sunday, November 4, by 6pm

A. Debugging

For this part of the assignment we give you four C++ source code files. These files have some bugs. The bugs might be in the form of compile time errors or erroneous results. There might be more than one bug in a given file. Your job is to find the bugs and fix them. For the assignment you will submit a bug-free version of each source code file.

1. `helloWorldBuggy.cpp`
2. `circleAreaBuggy.cpp`
3. `freeFallBuggy.cpp`
4. `powersBuggy.cpp`

B. C++ practice problems

1. Write a program that asks the user to input an integer that represents a length of time in seconds. The program should then output the number of hours, minutes, and seconds that corresponds to that number of seconds. For example, if the user inputs 50391 total seconds then the program should output 13 hours, 59 minutes, and 51 seconds.

2. The Babylonian algorithm to compute the square root of a number ***n*** is as follows:

   1. Make a ***guess*** at the answer (you can pick n/2 as your initial guess).
   2. Compute ***r = n / guess***
   3. Set ***guess = (guess +r) / 2***
   4. Go back to step 2 for as many iterations as necessary. The more that steps 2 and 3 are repeated, the closer ***guess*** will become to the square root of ***n***.

   Write a program that inputs an integer for ***n***, iterates through the Babylonian algorithm five times, and outputs the answer as a double to two decimal places. Your answer will be most accurate for small values of ***n***.

3. One way to measure the amount of energy that is expended during exercise is to use metabolic equivalents (MET). Here are some METS for various activities:

   Running 6 MPH: 10 METS
   Basketball: 8 METS
   Sleeping: 1 MET

   The number of calories burned per minute may be estimated using the formula:

   Calories/Minute = 0.0175 * MET * Weight(Kg)

   Write a program that asks the user to enter a subject's weight in pounds, the number of METS for an activity, and the number of minutes spent in that activity, and then outputs the estimate for total number of calories burned. One kilogram is equal to 2.2 pounds (you should declare this conversion factor as a constant.)

NOTE: if your C++ file does not compile with standard g++ compiler in Jupyter Hub you will get a zero on the C++ portion of the assignment (no partial credit). This will be the case with all C++ assignments going forward.

Submitting the assignment:

Zip all the .cpp files together and submit the resulting *.zip* file through Moodle as Assignment 7 by due date. You do not need to submit any executable files.