CSC112 Fundamentals of Computer Science Spring 2016
Lab 1

Make a directory named Lab1 ; keep all work for this assignment in that directory. In the following four parts, you will write four distinct C++ programs. Remember to put the lab number and part numbers (e.g, "Lab1, part 1", "Lab1, part 2",... etc.) and your name in a comment at the beginning of each program file.

Getting Started with C++

1. Our first program is pretty simple, just to get you writing on your own.

   Write a C++ program to input a temperature in Fahrenheit and output the equivalent temperature in Celsius. The formula is:

   $$C = 5/9(F - 32)$$

   Be mindful of the distinction between integer division and floating point division. Name your C++ source[1] code "`f_to_c_1.cc`".

   Test your program with $F = 70$, again with $F = 32$, $F = 212$, $F = 0$, and finally with $F = -40$. What Celsius temperatures do you get ?

2. Modify your program from part 1 to check for valid input. Use the member function `cin.fail()` to determine if the input is acceptable. If the input is unacceptable, print an error message to the error stream (using `cerr`), and exit. Name your source code "`f_to_c_2.cc`".

   You will need to use the include statement: `#include <cstdlib>` to use the `exit()` function.

3. Modify your program from part 2 to so that the temperature conversion calculation is done by a function called "fahrenheit_to_celsius()". The function header should be:

   ```
   double fahrenheit_to_celsius(double f)
   ```

   Name your source code "`f_to_c_3.cc`"

4. Modify your program from part 2 to so that the input and output is done using C-style functions `scanf()` and `printf()`. Name your source code "`f_to_c_4.cc`" You will need to use the include statement: `#include <cstdio>` to use the `scanf()` and `printf()` functions.

Turn in: Change to your home directory. Create a file named "lab1.tar" using the command:

```
tar cf lab1.tar Lab1
```

Upload the file "lab1.tar" using `sftp` to your account on telesto. (telesto.cs.wfu.edu)

[1] You may often see C++ program files ending with a **.cpp** file name extension. According to the Google Style Guide regarding file names: "Filenames should be all lowercase and can include underscores (_) or dashes (-). Follow the convention that your project uses. If there is no consistent local pattern to follow, prefer "_". C++ files should end in **.cc** and header files should end in **.h**."