University of Toronto
APS105H1F — Computer Fundamentals
Lab 1: Basic C++

Introduction

This lab is designed to give you practice with some basic C++ statements. This lab has four parts. By the end of the lab session, you will have created four files, namely files Lab1Part1.c, Lab1Part2.c, Lab1Part3.c, and Lab1Part4.c. Please keep in mind that the marking process will begin approximately forty minutes before the end of the lab.

Before attempting this lab, you should review your lecture notes from APS105 up to and including the lecture on Friday September 15th and read Chapter 1 and Chapter 2 (Sections 2.1 – 2.3) from the Savitch text. The questions in this lab assume that you have completed the parts titled "Text Editing" and "Compiling and Running a C++ Program" from Lab 0: UNIX Basics.

You should try to complete the lab in advance of your practical session and get help from a TA soon after arriving at SF 1013 so that you may promptly overcome any remaining difficulties.

Part 1 — Basic Output

Write a C++ program that uses cout to display the following picture on the screen:

```
        *
      *
    *
*     *
  *  *
   *
```

Part 2 - More Complicated Output

By using the tab escape sequence (\t) to line up output in columns, write a C++ program that uses cout to produce the following output (multiple, consecutive, tabs (\t) may be required for some columns):

```
Last Name       First Name      Quote

Barbossa,       Hector          "I'm disinclined to acquiesce to your request.
                                That means "no"."
Sparrow,        Jack            "Drink up, me 'earties, yo ho."
Swann,          Elizabeth       "You like pain? Try wearing a corset."
```

Part 3 - Program Understanding

The following program was written without comments or instructions to the user, except for a few input prompts:

```
#include <iostream>
using namespace std;

int main ()
{
    double base, height, area;

    cout << "Enter base: ";
    cin >> base;
    cout << "Enter height: ";
    cin >> height;
    area = ( base * height ) / 2;
    cout << "answer = " << area << endl;

    return 0;
}
```

Read through the program and figure out what it is doing. What result is it calculating? Revise the program by adding comments and modifying the output statements so that it is easier to understand, both for the user and for the programmer who must modify the program in the future.

Copy the file `/share/copy/aps105/Lab1Part3.c` to your own directory for use as a starting point in your revisions.

Part 4 - A Short Program

Write a C++ program that reads in a length given in feet and inches and converts the length to its metric equivalent in centimeters. Use the conversion factor 1 inch equals 2.54 centimeters.

Here is sample output from an execution of the program:

```
 This program converts from feet and inches to centimeters.
 Number of feet? 5 <Enter>
 Number of inches? 11 <Enter>
 The corresponding length is 180.34 cm.
```

The numbers 5 and 11 correspond to data entered by the user of the program. The text `<Enter>` corresponds to the user pushing the Enter key.

Your program must replicate the sample output.