CMPT 275: Laboratory 1

Pocket Change, Newton's Laws, Stocks: An Intro to C++ *5%*
Due: Friday, September 25th @ 12:00 p.m. (Noon)

The primary objective of this laboratory is to familiarize you with the fundamental structure of a C++ program. You will be developing ***three*** independent C++ programs from the simple specifications provided.

Laboratory Procedure:

Clone ***Laboratory1*** from the CS submission git repo:

```
$> git clone https://submit.cs.kingsu.ca/PATH/TO/YOUR/REPO.git
```

Note: The URL for your repo can be found at https://submit.cs.kingsu.ca.

Navigate into the cloned repo:

```
$> cd Laboratory1
```

Inside of the `PocketChange` directory (*PocketChange.cpp*), develop the following:

> Write a program that prompts the user to input a number of toonies, loonies, quarters, dimes, and nickels. The program will then output the total value of the coins in pennies.

Inside of the `NewtonsLaw` directory (*NewtonsLaw.cpp*), develop the following:

> Newton's Law states that force, F, between two bodies of masses, m_1 and m_2 is given by:
>
> $$F = G\frac{m_1 m_2}{r^2},$$
>
> in which G is the gravitational constant and r is the distance between the bodies. The value of G is approximately: $6.67428 \times 10^{-11}\ \frac{\mathrm{m}^3}{\mathrm{kg\,s}^2}$. Write a program that prompts the user to input the masses of the bodies and the distance between the bodies. The program then outputs the force between the bodies.

Inside of the `StockCalculator` directory (*StockCalculator.cpp*), develop the following:

> Cindy uses the services of a brokerage firm to buy and sell stocks. The firm charges 1.5% service charges on the total amount for each transaction, buy or sell. When Cindy sells stocks, she would like to know if she gained or lost on a particular investment. Write a program that allows Cindy to input the number of shares sold, the purchase price of each share, and the selling price of each share. The program outputs the total amount Cindy paid (including service charges), the total service charges, the amount gained or lost, and the amount received after selling the stock (after service charges).

Program Requirements:

- Your programs must prompt the user for each of the inputs
  (e.g. `How many toonies are in your pocket?`)
- You must ask for the inputs **in the order** described by the program specification:
  (e.g. Toonies, then Loonies, then Quarters, then Dimes, finally Nickels)
- Programs must be well documented (commented), and you must select appropriate data types for each of the inputs (i.e. int, float, double, string, etc.)
- Constants should be declared as such (i.e. `const double PI = 3.14159265`).

Grading

Each of the programs will count equally towards your total mark for the laboratory. Each program will be graded as follows:

Program Input & Prompts	3
Program Output	3
Data Representation	1
Documentation	1
Total	8

*** **NOTE:** Your code **must compile and execute** within the **laboratory environment**. Failure to do so will result in a **mark of ZERO** for the program. ***

Submission

Submit your code through the CS submission git. Be sure to ***push*** your submission before the deadline.

```
$> git add -u
$> git commit -m "My very first CS Lab Submission"
$> git push
```