Name: Amuldeep Dhillon
Class: CS116-02 Sha
Assignment: Lab 1-Conversions
Date:2/9/17

Description:

The program will let the user to convert different values. The program will start with a menu that allows the user to pick what value types to convert by typing 1-3 or 4 to quit. The first option will allow the user to enter a value of seconds which will be converted to hours, minutes, and seconds. The second option allows the user to convert Fahrenheit to Celsius. The third option will allow the user to convert Celsius to Fahrenheit. The fourth option, as previously mentioned, quits the program. If an incorrect value type, such as negative time or a character, is entered the program the user to try again with a proper value type.

Inputs:

- ❖ The user first inputs a selection 1-4 which correspond with the menu.
    - ➢ The user can input a positive integer, or zero. The program will make sure.
    - ➢ The user can input any real number. The program will make sure.
    - ➢ The user can input any real number. The program will make sure.

Outputs:

- ❖ The program will display my name, my class, the assignment, and the time.
- ❖ Next it displays a menu which prompts the user to make a choice.
    - ➢ Seconds: The program will tell the user to enter a positive number
        - ■ If it is positive the program will convert the seconds and display the phrase "__ seconds is __ hours __ minutes __ and __ seconds" with the blanks filled by the conversions
        - ■ If the user inputs an incorrect data type the program will ask for a correct input.
    - ➢ Fahrenheit to Celsius: The program will ask for a real number
        - ■ If the user inputs a number it will display the phrase "__ degrees Fahrenheit is __ degrees Celsius" with the input and conversions in the blanks
        - ■ If the user inputs an incorrect data type it will tell the user to input a correct data type
    - ➢ Celsius to Fahrenheit: The program will ask for a real number
        - ■ If the user inputs a number it will display the phrase "__ degrees Celsius is __ degrees Fahrenheit" with the input and conversions in the blanks

- If the user enters an incorrect data type the user will be prompted to enter a correct one
  - ➢ Quit: The program will say "Good Bye" and exit out.

Source Code:

Lab.h:
```
#ifndef LAB_H
#define LAB_H

#include <iostream>
#include <string>
#include <iomanip>
#include <ctime>
#include <limits>

void printMeFirst(std::string name, std::string courseInfo);
void menu();
void convertTime();
void convertCtoF();
void convertFtoC();

#endif
```

main.cpp
```
/*
 *Purpose:
 * Calls the printMeFirst Funtion and the Menu Function
 *
 * @author Amuldeep Dhillon
 * @version 1.0 2/3/2017
 *
 * @param - none
 * @return - 0
*/
#include "lab.h"
int main (){
    printMeFirst("Amuldeep Dhillon", "Lab 1: CS 116-02 Thursdays");
    menu();
```

```
    return 0;
}
```

printMeFirst.cpp:

```
/*
 *Purpose:
 * Print out programmer's information such as name, class information
 * and date/time the program is run
 *
 * @author Ron Sha
 * @version 1.0 1/27/2017
 *
 * @param name - Amuldeep Dhillon
 * @param courseInfo - Lab 1: CS 116-02 Thursdays
 * @return - none
 */


#include "lab.h"
void printMeFirst(std::string name, std::string courseInfo)

{

std::cout <<" Program written by: "<< name << std::endl; // put your name here

std::cout <<" Course info: "<< courseInfo << std::endl;

time_t now = time(0);  // current date/time based on current system

char* dt = ctime(&now); // convert now to string for

   std::cout << " Date: " << dt << std::endl;

}
```

menu.cpp

```
/*
 *Purpose:
```

```
 *  Displays a menu and takes an input for user to select
 *
 * @author Amuldeep Dhillon
 * @version 1.0 2/3/2017
 *
 * @param - none
 * @inputs - 1 2 3 4
 * @outputs - The menu, Error messages, and Good Bye
 * @return - none
*/
#include "lab.h"
using namespace std;
int choice;
void menu(){
do {
   cout << "Choose what you want to do:" << endl;
   cout << "   1 – Convert Second to Hours, Minutes and Seconds" << endl;
   cout << "   2 - Convert Fahrenheit to Celsius:" << endl;
   cout << "   3 - Convert Celsius to Fahrenheit:" << endl;
   cout << "   4 - Quit:" << endl;
   cin >> choice;

   while(cin.fail()){
        cin.clear();
        cin.ignore(numeric_limits<streamsize>::max(), '\n');
        cout << "Error: Please Pick One Of The Options" << endl;
        cin >> choice;
   }

   if(choice == 1)
        {convertTime();}

   else if(choice == 2)
        {convertFtoC();}

   else if(choice == 3)
        {convertCtoF();}

   else if(choice == 4)
```

```
            {cout << "Good Bye \n";}


    else if(choice != 1 || 2 || 3 || 4)
            {cout << "Error: Please Pick One Of The Options" << endl;}


} while (choice != 4);
}
```

convertTime.cpp

```
/*
 *Purpose:
 *   Convert Seconds into Hours, Minutes, and Seconds
 *
 * @author Amuldeep Dhillon
 * @version 1.0 2/3/2017
 *
 * @param - none
 * @inputs - a positive integer
 * @outputs - Prompt for number of seconds, the conversions
 *                        and any error messages
 * @return - none
*/
#include "lab.h"
using namespace std;
void convertTime(){
    int time1;
    int time2;
    int hours;
    int minutes;
    int seconds;
    cout << "Please enter the amount of Time in Seconds:" << endl;
    cin >> time1;

    while(cin.fail() || time1 < 0){
        cin.clear();
        cin.ignore(numeric_limits<streamsize>::max(), '\n');
        cout << "Error: Please Enter a Positive Integer" << endl;
        cin >> time1;
    }
```

```cpp
    hours = time1/3600;
    time2 = time1 - (hours * 3600);
    minutes = time2/60;
    seconds = time2 - (minutes * 60);
    cout << time1 << " Seconds is " << hours << " Hours, " << minutes
    << " Minutes, and " << seconds << " Seconds!" << endl;
}
```

convertFtoC.cpp
```cpp
/*
 *Purpose:
 *  Convert Fahrenheit to Celsius
 *
 * @author Amuldeep Dhillon
 * @version 1.0 2/3/2017
 *
 * @param - none
 * @inptus - A Real Number
 * @outputs - Prompt for Fahrenheit, The conversion, and any Error
 *                      messages
 * @return - 0
 */
#include "lab.h"
using namespace std;
void convertFtoC(){
    double f;
    double c;
    int rounder;
    cout << "Enter a Value in Fahrenheit:" << endl;
    cin >> f;

    while(cin.fail()){
        cin.clear();
        cin.ignore(numeric_limits<streamsize>::max(), '\n');
        cout << "Error: Please Enter an Integer" << endl;
        cin >> f;
    }
```

```cpp
    rounder = ((f - 32) * (5.0/9.0))*100;
    c = rounder / 100.0;
    cout << fixed << setprecision(1) << f << " degrees Fahrenheit " <<
    "is " << c << " degrees Celsius" << endl;



}
```

convertCtoF.cpp

```cpp
/*
 *Purpose:
 *  Convert Celsius to Fahrenheit
 *
 * @author Amuldeep Dhillon
 * @version 1.0 2/3/2017
 *
 * @param - none
 * @inptus - A Real Number
 * @outputs - Prompt for Celsius, The conversion, and any Error
 *                      messages
 * @return - 0
*/
#include "lab.h"
using namespace std;
void convertCtoF(){
    double f;
    double c;
    int rounder;
    cout << "Enter a Value in Celsius:" << endl;
    cin >> c;

    while(cin.fail()){
        cin.clear();
        cin.ignore(numeric_limits<streamsize>::max(), '\n');
        cout << "Error: Please Enter an Integer" << endl;
        cin >> c;
    }

    rounder = ((c * (9.0/5.0)) + 32)*100;
```
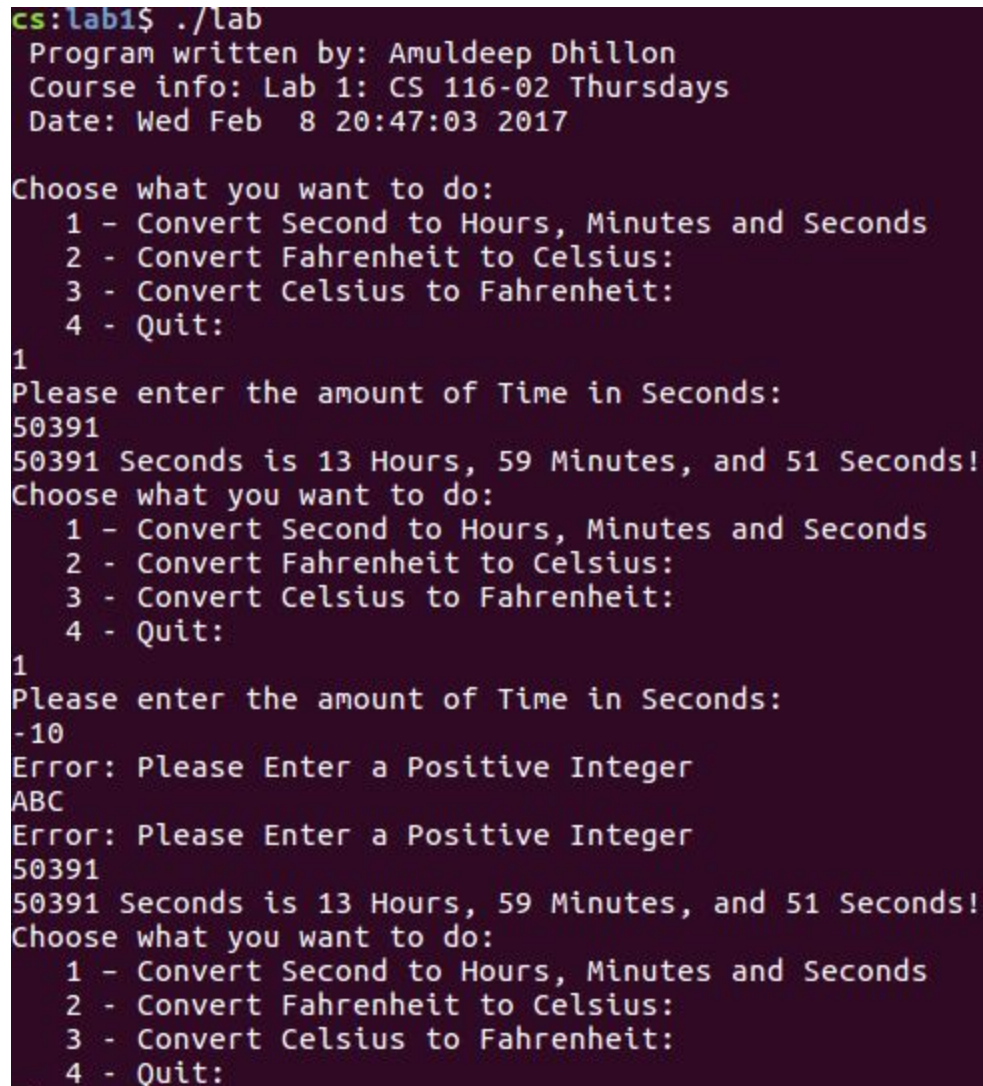
```
    f = rounder / 100.0;
    cout << fixed << setprecision(1) << c << " degrees Celsius " <<
    "is " << f << " degrees Fahrenheit" << endl;
}
```

Screenshots:

```
cs:lab1$ ./lab
 Program written by: Amuldeep Dhillon
 Course info: Lab 1: CS 116-02 Thursdays
 Date: Wed Feb  8 20:47:03 2017

Choose what you want to do:
   1 - Convert Second to Hours, Minutes and Seconds
   2 - Convert Fahrenheit to Celsius:
   3 - Convert Celsius to Fahrenheit:
   4 - Quit:
1
Please enter the amount of Time in Seconds:
50391
50391 Seconds is 13 Hours, 59 Minutes, and 51 Seconds!
Choose what you want to do:
   1 - Convert Second to Hours, Minutes and Seconds
   2 - Convert Fahrenheit to Celsius:
   3 - Convert Celsius to Fahrenheit:
   4 - Quit:
1
Please enter the amount of Time in Seconds:
-10
Error: Please Enter a Positive Integer
ABC
Error: Please Enter a Positive Integer
50391
50391 Seconds is 13 Hours, 59 Minutes, and 51 Seconds!
Choose what you want to do:
   1 - Convert Second to Hours, Minutes and Seconds
   2 - Convert Fahrenheit to Celsius:
   3 - Convert Celsius to Fahrenheit:
   4 - Quit:
```

```
cs:lab1$ ./lab
 Program written by: Amuldeep Dhillon
 Course info: Lab 1: CS 116-02 Thursdays
 Date: Wed Feb  8 20:54:58 2017

Choose what you want to do:
   1 - Convert Second to Hours, Minutes and Seconds
   2 - Convert Fahrenheit to Celsius:
   3 - Convert Celsius to Fahrenheit:
   4 - Quit:
2
Enter a Value in Fahrenheit:
82
82.0 degrees Fahrenheit is 27.8 degrees Celsius
Choose what you want to do:
   1 - Convert Second to Hours, Minutes and Seconds
   2 - Convert Fahrenheit to Celsius:
   3 - Convert Celsius to Fahrenheit:
   4 - Quit:
2
Enter a Value in Fahrenheit:
100
100.0 degrees Fahrenheit is 37.8 degrees Celsius
Choose what you want to do:
   1 - Convert Second to Hours, Minutes and Seconds
   2 - Convert Fahrenheit to Celsius:
   3 - Convert Celsius to Fahrenheit:
   4 - Quit:
2
Enter a Value in Fahrenheit:
Ten
Error: Please Enter an Integer
10
10.0 degrees Fahrenheit is -12.2 degrees Celsius
```

```
cs:lab1$ ./lab
 Program written by: Amuldeep Dhillon
 Course info: Lab 1: CS 116-02 Thursdays
 Date: Wed Feb  8 20:56:05 2017

Choose what you want to do:
   1 - Convert Second to Hours, Minutes and Seconds
   2 - Convert Fahrenheit to Celsius:
   3 - Convert Celsius to Fahrenheit:
   4 - Quit:
3
Enter a Value in Celsius:
12
12.0 degrees Celsius is 53.6 degrees Fahrenheit
Choose what you want to do:
   1 - Convert Second to Hours, Minutes and Seconds
   2 - Convert Fahrenheit to Celsius:
   3 - Convert Celsius to Fahrenheit:
   4 - Quit:
3
Enter a Value in Celsius:
100
100.0 degrees Celsius is 212.0 degrees Fahrenheit
Choose what you want to do:
   1 - Convert Second to Hours, Minutes and Seconds
   2 - Convert Fahrenheit to Celsius:
   3 - Convert Celsius to Fahrenheit:
   4 - Quit:
3
Enter a Value in Celsius:
fifty
Error: Please Enter an Integer
50
50.0 degrees Celsius is 122.0 degrees Fahrenheit
```

```
cs:lab1$ ./lab
 Program written by: Amuldeep Dhillon
 Course info: Lab 1: CS 116-02 Thursdays
 Date: Wed Feb  8 20:57:45 2017

Choose what you want to do:
   1 - Convert Second to Hours, Minutes and Seconds
   2 - Convert Fahrenheit to Celsius:
   3 - Convert Celsius to Fahrenheit:
   4 - Quit:
4
Good Bye
```