Haichuan Wei Lab1: Conversion CS-116 9/6/21

1. **Program Description**
   - This program was a multi-function calculator letting the user choose what they want to convert and processing their data accordantly. The user is first met with a list of converters they can choose from. Time and temperature. Once the user picks their converter, their input is validated to be convertible and then it will output the converted value. My program continues to run until the user presses the “Quit” option.
2. **Program Source Code**
   - Main.cpp

Lab 1 > C++ main.cpp > ...

```cpp
/*
Purpose- This project is a multifunctional calculator that can be used to convert secounds to hours, minutes, and seconds. It also convert Fahrenheit to Celsius and Celsius to Fahrenheit.

@author Haichuan Wei
@version 1.0 9/2/21

@param fahrenheit - The number of fahrenheit defined by the user
@param celcius - The number of celcius defined by the user
@param seconds - The number of seconds defined by the user
@Arthur-Systems
@return-none
*/
#include <iostream>
#include <cstdlib>
#include <string>
#include "printMeFirst.h"
#include "Time.h"
#include "Ftc.h"
#include "CtF.h"
int main()
{
    int choice, seconds;
    double fahrenheit, celcius;

    while (choice != 4)
    {
        printMeFirst("Haichuan Wei", "CS-116-01 C++ Programming");
        cout << "Welcome to my calculator!" << endl;
        cout << "Choose one of the four options!" << endl;
        cout << endl;
        cout << "\t 1.Seconds to hours minutes and seconds " << endl
             << "\t 2.Fahrenheit to Celsius" << endl
             << "\t 3.Celsius to Fahrenheit" << endl
             << "\t 4.Quit" << endl;
        cin >> choice;

        if (!cin.fail())
        {
            if (choice == 1)
```

Lab 1 > C++ main.cpp > ...

```cpp
            {
                cout << "\tYou have chosen the time calculator!\n\tPlease Input the seconds you want to convert" << endl;
                cin >> seconds;
                cout << endl;
                Time(seconds);
                cout << endl;
                cin.clear();
            }
            else if (choice == 2)
            {
                cout << "\tYou picked the Fahrenheit to Celsius Calculator!\n\tPlease input the Temp in Fahrenheit you want to conver." << endl;
                cin >> fahrenheit;
                cout << endl;
                FtoC(fahrenheit);
                cout << endl;
                cin.clear();
            }
            else if (choice == 3)
            {
                cout << "\tYou picked the Celsius to Fahrenheit Calculator\n\tPlease input the Temp in Celsius you want to convert." << endl;
                cin >> celcius;
                cout << endl;
                CtoF(celcius);
                cout << endl;
                cin.clear();
            }
            else if (choice == 4)
            {
                cout << "Rodger that, Quitting!" << endl;
                return 0;
            }
            else
            {
                cout << "You have entered an invalid option. \n Pick 1, 2 , or 3" << endl;
                cin.clear();
                cin.ignore(1000, '\n');
                break;
            }
        }
```

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```
Lab 1 > C++ main.cpp > ...
79              else
80              {
81                  cout << "Please enter a valid NUMBER!" << endl;
82                  cin.clear();
83                  cin.ignore(1000, '\n');
84                  cin >> choice;
85              }
86          }
87      }
88
```

- Time.cpp

```
Lab 1 > C++ Time.cpp > ...
1   /*
2   Purpose- This function takes the user defined seconds and display it in the format of hours:minutes:seconds. Then it asks the user if they want to repeat the process.
3
4   @author Haichuan Wei
5   @version 1.0 9/2/21
6   @using  CLion
7
8   @param seconds - the user defined seconds
9   @return-none
10  */
11  #include "Time.h"
12  #include <iostream>
13  using namespace std;
14  void Time(int seconds)
15  {
16
17      if (seconds > 0)
18      {
19          int hours = seconds / 3600;
20          int minutes = (seconds % 3600) / 60;
21          int seconds2 = seconds % 60;
22          cout << hours << " hours " << minutes << " minutes " << seconds2 << " seconds" << endl;
23      }
24      else if (cin.fail())
25      {
26          cout << "Please enter A valid NUMBER" << endl;
27          cin.clear();
28          cin.ignore(1000, '\n');
29          cin >> seconds;
30          Time(seconds);
31      }
32      else
33      {
34          cout << "Please enter a POSTIVE number" << endl;
35          cin >> seconds;
36          Time(seconds);
37      }
38  }
39
```

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- FtC.cpp

Lab 1 > C++ FtC.cpp > ...

```cpp
/*
Purpose- This programs takes the user defined fahrenheit and converts it to celsius.
@author Haichuan Wei
@version 1.0 9/2/21
@using  CLion

@param fahrenheit - the user defined fahrenheit
@return-none
*/
#include <iostream>
#include <iomanip>
#include "Ftc.h"
using namespace std;
void FtoC(double fahrenheit)
{
    if (!cin.fail())
    {

        double celsius = (fahrenheit - 32) * 5 / 9;
        cout << fahrenheit << " degrees Fahrenheit is " << setprecision(1) << fixed << celsius << " degrees Celsius." << endl;
    }
    else
    {
        cout << "Please enter a valid NUMBER!" << endl;
        cin.clear();
        cin.ignore(1000, '\n');
        cin >> fahrenheit;
        FtoC(fahrenheit);
    }
}

```

- CtF.cpp

Lab 1 > C++ CtF.cpp > ...

```cpp
/*
Purpose- This programs takes the user defined celcius and converts it to farnhrenheit .

@author Haichuan Wei
@version 1.0 9/2/21
@using  CLion

@param celcius - the user defined celcius
@return-none
*/
#include <iostream>
#include <iomanip>
#include "CtF.h"
using namespace std;

void CtoF(double celcius)
{
    if (!cin.fail())
    {
        double fahrenheit;
        fahrenheit = (celcius * 9 / 5) + 32;
        cout << celcius << " degrees celcius is " << setprecision(1) << fixed << fahrenheit << " degrees fahrenheit." << endl;
    }
    else
    {
        cout << "Please enter a valid NUMBER!" << endl;
        cin.clear();
        cin.ignore(1000, '\n');
        cin >> celcius;
        CtoF(celcius);
    }
}
```

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printMeFirst.cpp

```cpp
#include "printMeFirst.h"
#include <string>
#include <iostream>
#include <iomanip>
#include <ctime>
using namespace std;

/*
Purpose- Prints the information of the developer.
@author Haichuan Wei
@version 1.0 9/2/21
@using  CLion
@param name --
@param courseInfo - CS-116 OOP C++
@return-
*/

void printMeFirst(string name, string courseInfo)
{
    cout << "Program written by: " << name << endl;
    cout << "Course Info: " << courseInfo << endl;
    time_t now = time(0);
    char *dt = ctime(&now);
    cout << "Date: " << dt << endl;
}

```

3. **Program Outputs**

   - Shows the execution of the make file and shows the working menu selection and the time calculator. Using the test cases of 50391 and -80, expected results occurred

```
arthur@DESKTOP-UP5LF24: /mnt/c/Users/Arthur/Documents/Github/Cpp_Projects/Intermediate C++/Lab 1
arthur@DESKTOP-UP5LF24:/mnt/c/Users/Arthur/Documents/Github/Cpp_Projects/Intermediate C++/Lab 1$ make all
g++ -Wall -Werror -Wextra -pedantic -std=c++17 -g -fsanitize=address   -c -o main.o main.cpp
g++ -Wall -Werror -Wextra -pedantic -std=c++17 -g -fsanitize=address   -c -o printMeFirst.o printMeFirst.cpp
g++ -Wall -Werror -Wextra -pedantic -std=c++17 -g -fsanitize=address   -c -o Time.o Time.cpp
g++ -Wall -Werror -Wextra -pedantic -std=c++17 -g -fsanitize=address   -c -o FtC.o FtC.cpp
g++ -Wall -Werror -Wextra -pedantic -std=c++17 -g -fsanitize=address   -c -o CtF.o CtF.cpp
g++ -fsanitize=address -o Calculator main.o printMeFirst.o Time.o FtC.o CtF.o
arthur@DESKTOP-UP5LF24:/mnt/c/Users/Arthur/Documents/Github/Cpp_Projects/Intermediate C++/Lab 1$ make run
echo "Code created by Haichuan Wei. Enjoy :3"
Code created by Haichuan Wei. Enjoy :3
./Calculator
Program written by: Haichuan Wei
Course Info: CS-116-01 C++ Programming
Date: Fri Sep 10 00:23:36 2021

Welcome to my calculator!
Choose one of the four options!

         1.Seconds to hours minutes and seconds
         2.Fahrenheit to Celsius
         3.Celsius to Fahrenheit
         4.Quit
1
        You have chosen the time calculator!
        Please Input the seconds you want to convert
-80

Please enter a POSTIVE number
50391
13 hours 59 minutes 51 seconds
```

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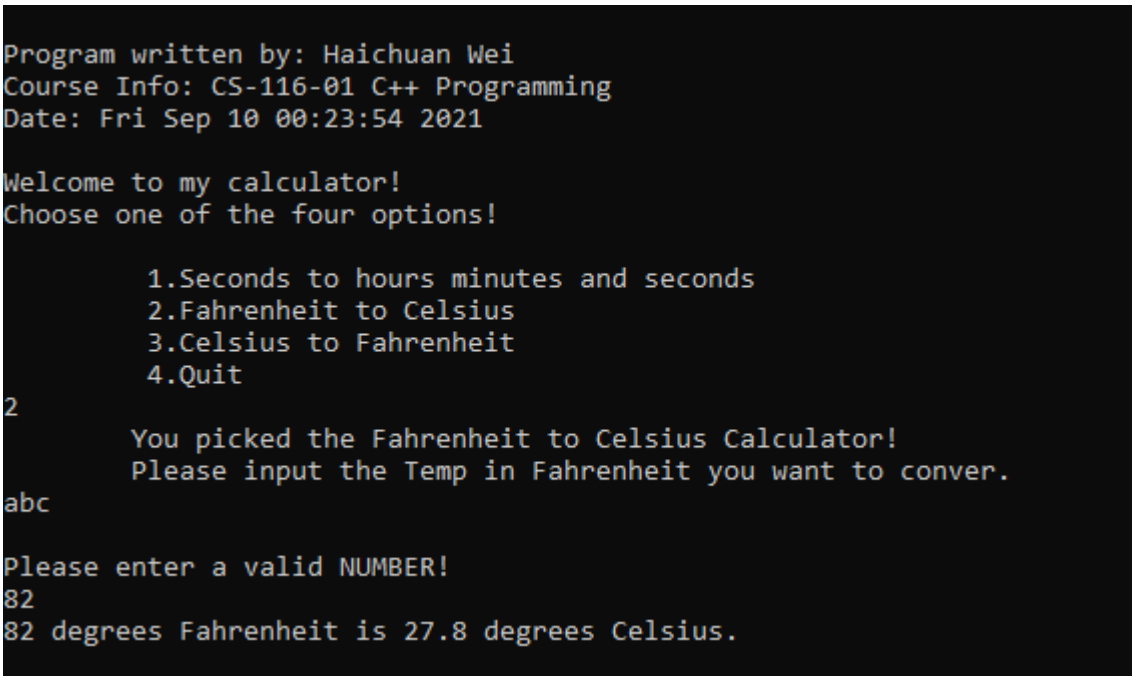
- This test shows the Fahrenheit to Celsius calculator. In this test, my code stands up to both test cases by returning a warning if it's the wrong data type and has a single decimal point when needed.



- This test is the Celsius to Fahrenheit calculator. It satisfies both test cases. My code returns an error whenever a non-numerical input is put in. My code also has a permanent one decimal place. This output also shows quitting.