Anjali Patel
CS-116
Professor Sha

Lab 1 - Unit Conversion

Program Description:

This program is user friendly program, it allows user to interact with the program. In this unit conversion lab the program converts from seconds to hours and minutes, Fahrenheit to Celsius and Celsius to Fahrenheit. The user has the option to select which unit types they want to be convert. Each selection has its own function, which is called in the main function. The program will run according to what the user inputs in the input section. For example the user has four options and if the user chooses the option that is not available to them, then the program will tell the user to input valid number. Also, if the user inputs char values than the program will tell user that their input is not valid and will give them another chance. The program will give infinite number of chances until the user inputs correct value for conversion or chooses the option provided.

Source Code:

```
/*
Anjali Patel (CS-116 Lab 1)
Monday morning 8 am with Professor Ron Sha.
In this unit conversion lab the program converts from seconds to hours and minutes,
Fahrenheit to Celsius and Celsius to Fahrenheit. The user has the option to select
which unit types they want to be converted. Each selection has its own function.
*/

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


using namespace std;

//function declaration
void printMeFirst(string name, string courseInfo);
void select();
void fToc();
void secondsConversion();
void cTof();

//In this main function other functions are being called when the program executes.
```

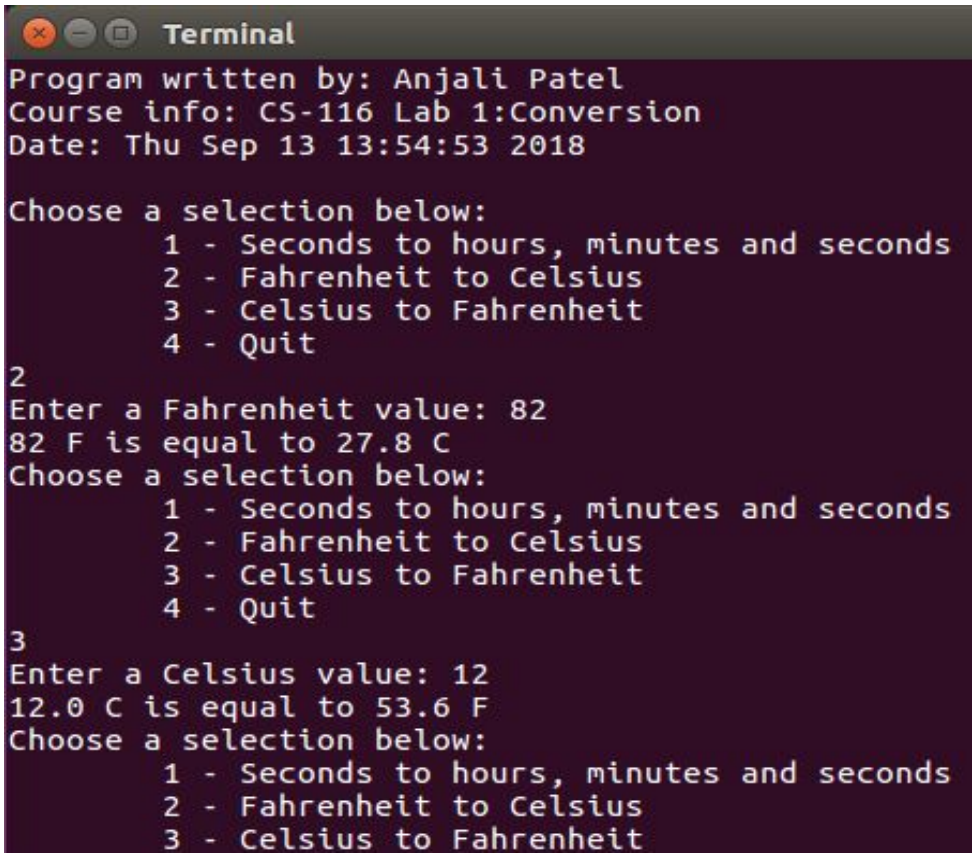
```
int main()
{
   printMeFirst("Anjali Patel","CS-116 Lab 1:Conversion"); // pass your name, your class info to function so it will print them out.
        select();

}

/* Print out the programmer's information such as name, class information
and date/time the program is run

        @param name - the name of the programmer
        @param courseInfo - the name of the course
        @return - none
*/

//This function contains programmer's information that prints out in beginning of the program
void printMeFirst(string name, string courseInfo)
{
        cout <<"Program written by: "<< name << endl; // put your name here
        cout <<"Course info: "<< courseInfo << endl;
        time_t now = time(0); // current date/time based on current system
        char* dt = ctime(&now); // convert now to string for
        cout << "Date: " << dt << endl;
}




//This function converts seconds int minutes, hours and seconds.
void secondsConversion()
{
        int seconds, minutes, hours;
        cout << "Enter in the number of seconds: " << endl; //Asks the user to enter a number of seconds.
        while (1)
        {
        if (cin >> seconds && seconds >= 0) //Takes in the seconds value and checks if it is a valid positive number.
        {
        break; //If it is valid with the if statement above, this breaks the loop of invalid input.
        }
```

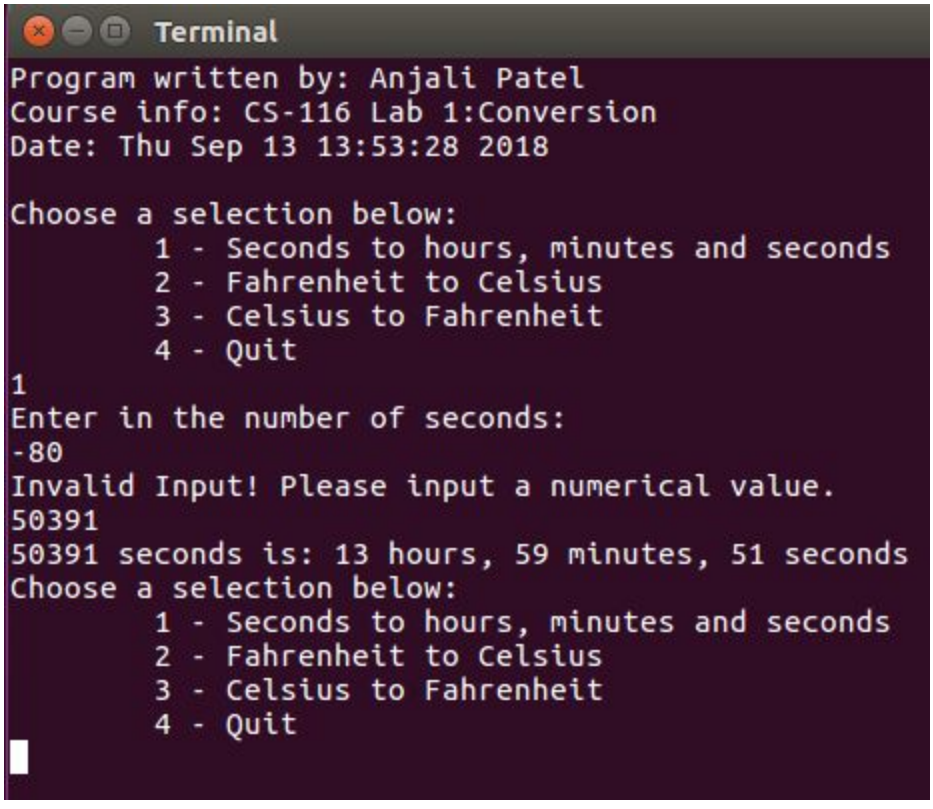
```
	else //Error will keep on printing if random letters are entered in.
	{
	cout << "Invalid Input! Please input a numerical value." << endl;
	cin.clear(); //Allows user to reenter the seconds
	while (cin.get() != '\n') ;
	}

	}

	minutes = seconds / 60; //Formulas for conversion.
	hours = minutes / 60;
	cout << seconds << " seconds is: " << int(hours) << " hours, " << int(minutes%60) << "
minutes, " << int(seconds%60) << " seconds " << endl; //Displays result
}

//This function converts the temperature from Fahrenheit to Celsius.
void fToC()
{
	float f = 0.0, c = 0.0;
	cout << "Enter a Fahrenheit value: ";

	while (1)
	{
	if (cin >> f) //Takes in the Fahrenheit value and checks if it is a valid number
	{
	break; //If it is valid with the if statement above, this breaks the loop of invalid input.
	}
	else
	{
	cout << "Invalid Input! Please input a numerical value." << endl;

	cin.clear(); //Allows user to reenter the Fahrenheit.
	while (cin.get() != '\n') ;

	}
	}
	c = ((f-32.0)*(5.0/9.0)); //Formulas for conversion.
	cout <<  f << " F is equal to " << fixed << setprecision(1) << c << " C " << endl; //Displays
result
}

//This function converts the temperature from Celsius to Fahrenheit.
```

```
void cToF()
{
	double c, f;
	cout << "Enter a Celsius value: ";
	while (1) {
	if (cin >> c) //Takes in the Celsius value and checks if it is a valid number
	{
	break; //If it is valid with the if statement above, this breaks the loop of invalid input.
	}
	else
	{
	cout << "Invalid Input! Please input a numerical value." << endl;
	cin.clear(); //Allows user to reenter the Celsius.
	while (cin.get() != '\n') ;

	}
	}

	f = c*(9.0/5.0) + 32.0; //Formulas for conversion.
	cout << c << " C is equal to " << f << " F " << endl; //Displays result


}
/*This function has the selection menu with cin.fail() condition in do-while loop. The selection menu gives user
 * choice on what unit conversion they want to use. When the program is executed the first thing that is printed
 * is the printMeFirst function and then this function. This function will show the 4 options user has. This function
 * is called in int main() function.*/
void select()
{
	int selection;
	do
	{
	cout << "Choose a selection below:" << endl;
	cout << "\t1 - Seconds to hours, minutes and seconds" << endl;
	cout << "\t2 - Fahrenheit to Celsius" << endl;
	cout << "\t3 - Celsius to Fahrenheit" << endl;
	cout << "\t4 - Quit" << endl;
	cin >> selection; //User inputs their selection
```

```
        while(cin.fail())
        {
        cout << "Invalid selection! Please try again" << endl;
        cin.clear(); //Allows user to reenter the conversion they want to convert.
        cin.ignore();
                while (cin.get() != '\n') ;
        select();
        }
        //This selection goes to Seconds Conversion.
        if(selection == 1)
        {
                secondsConversion();
        }
        //This selection goes to Fahrenheit to Celsius Conversion.
        else if(selection == 2)
        {

                fToC();
        }
        //This selection goes to Celsius to Fahrenheit Conversion.
        else if(selection == 3)
        {
                cToF();
        }
        //This selection quits the program with a closing greeting.
        else if(selection == 4)
        {
                        cout << "Thank You for using my program! Have a great day!" << endl;

        }
        //This statement gets printed if user selects an invalid input.
        else
        {

                cout << "Please enter in a valid selection" << endl;

        }
        }while (selection != 4); //This quits out the program when user selects quit
}
```

Screen Shots:


Terminal
Program written by: Anjali Patel
Course info: CS-116 Lab 1:Conversion
Date: Thu Sep 13 13:54:53 2018
Choose a selection below:
1 - Seconds to hours, minutes and seconds
2 - Fahrenheit to Celsius
3 - Celsius to Fahrenheit
4 - Quit
2
Enter a Fahrenheit value: 82
82 F is equal to 27.8 C
Choose a selection below:
1 - Seconds to hours, minutes and seconds
2 - Fahrenheit to Celsius
3 - Celsius to Fahrenheit
4 - Quit
3
Enter a Celsius value: 12
12.0 C is equal to 53.6 F
Choose a selection below:
1 - Seconds to hours, minutes and seconds
2 - Fahrenheit to Celsius
3 - Celsius to Fahrenheit


Terminal
Program written by: Anjali Patel
Course info: CS-116 Lab 1:Conversion
Date: Thu Sep 13 13:53:28 2018
Choose a selection below:
1 - Seconds to hours, minutes and seconds
2 - Fahrenheit to Celsius
3 - Celsius to Fahrenheit
4 - Quit
1
Enter in the number of seconds:
-80
Invalid Input! Please input a numerical value.
50391
50391 seconds is: 13 hours, 59 minutes, 51 seconds
Choose a selection below:
1 - Seconds to hours, minutes and seconds
2 - Fahrenheit to Celsius
3 - Celsius to Fahrenheit
4 - Quit

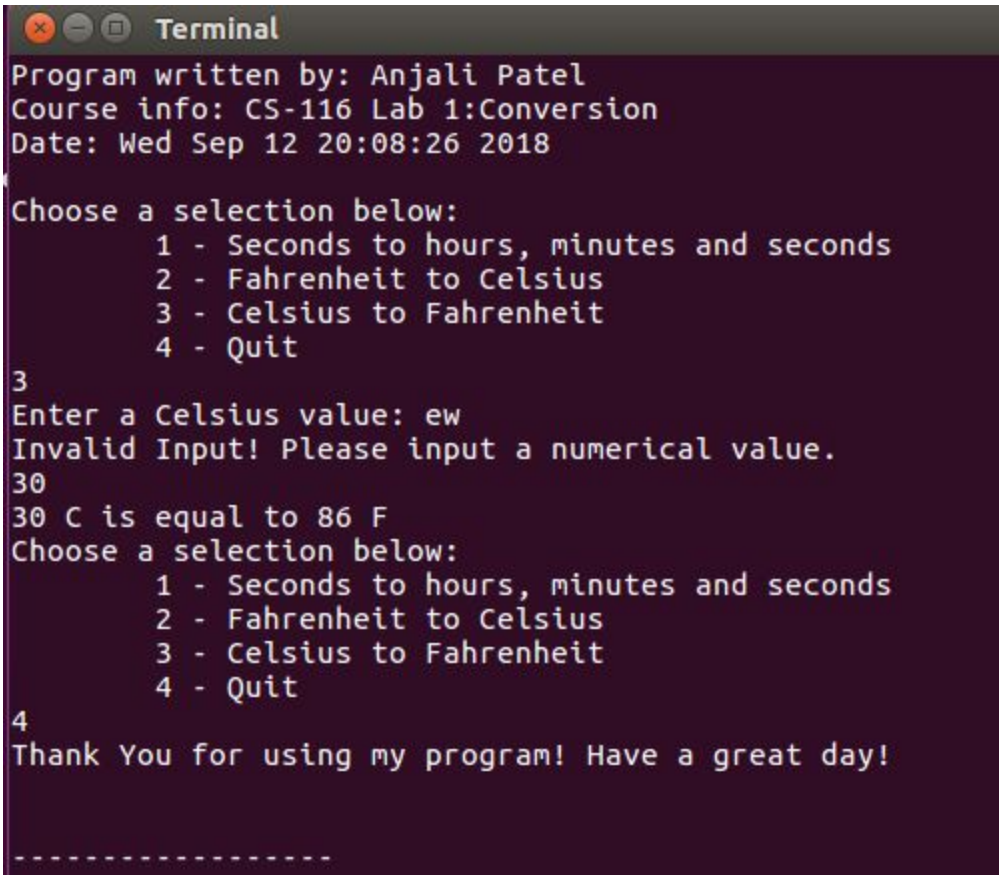
```
        2 - Fahrenheit to Celsius
        3 - Celsius to Fahrenheit
        4 - Quit
8
Please enter in a valid selection
Choose a selection below:
        1 - Seconds to hours, minutes and seconds
        2 - Fahrenheit to Celsius
        3 - Celsius to Fahrenheit
        4 - Quit
```

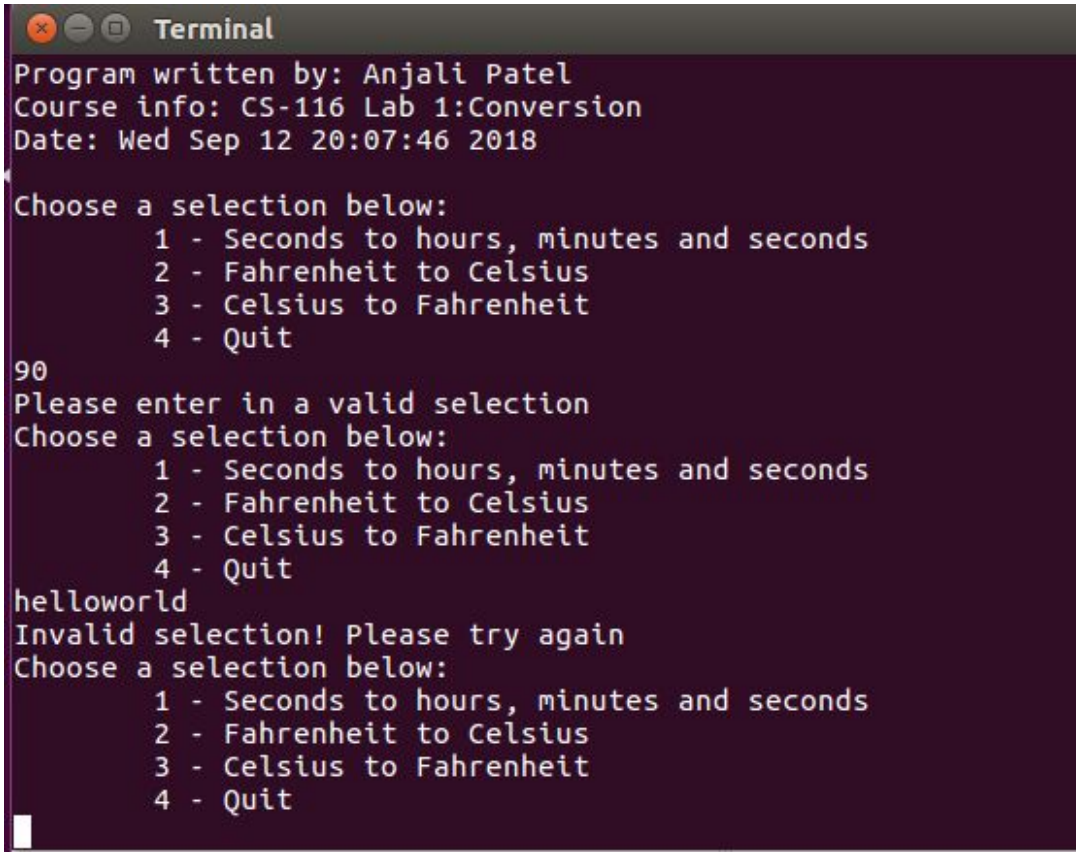
Terminal

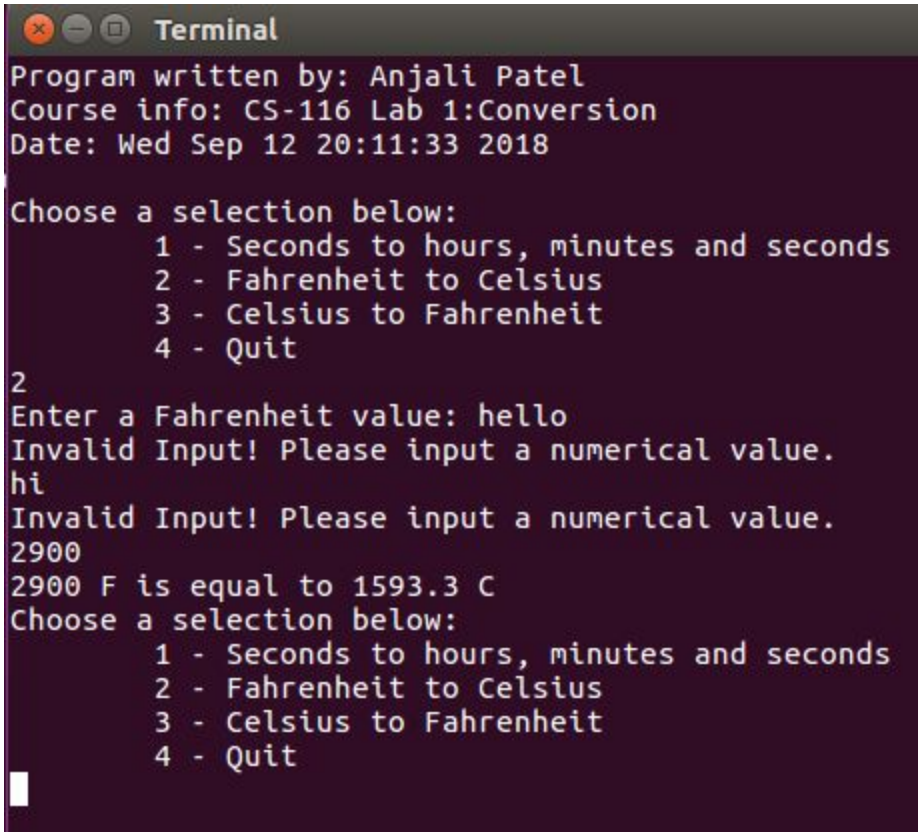
```
Program written by: Anjali Patel
Course info: CS-116 Lab 1:Conversion
Date: Wed Sep 12 20:03:04 2018

Choose a selection below:
        1 - Seconds to hours, minutes and seconds
        2 - Fahrenheit to Celsius
        3 - Celsius to Fahrenheit
        4 - Quit
1
Enter in the number of seconds:
50391
50391 seconds is: 13 hours, 59 minutes, 51 seconds
Choose a selection below:
        1 - Seconds to hours, minutes and seconds
        2 - Fahrenheit to Celsius
        3 - Celsius to Fahrenheit
        4 - Quit
```

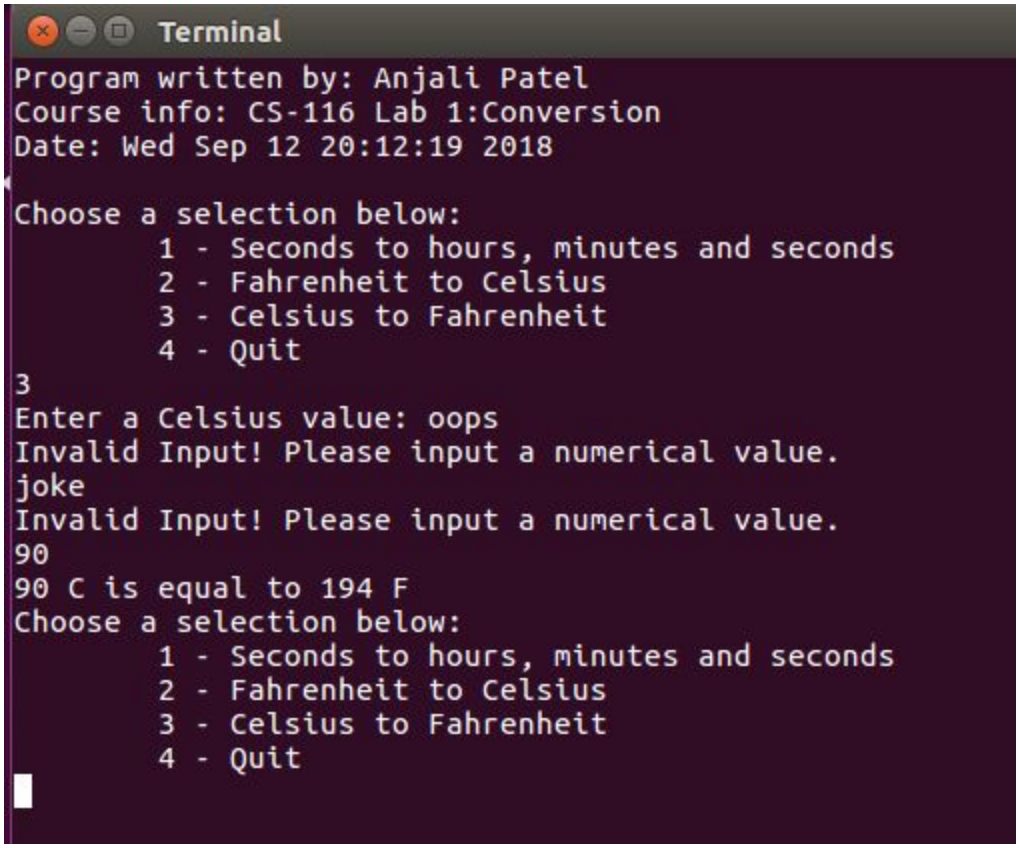
Terminal

```
Program written by: Anjali Patel
Course info: CS-116 Lab 1:Conversion
Date: Wed Sep 12 20:05:59 2018

Choose a selection below:
        1 - Seconds to hours, minutes and seconds
        2 - Fahrenheit to Celsius
        3 - Celsius to Fahrenheit
        4 - Quit
2
Enter a Fahrenheit value: 81
81 F is equal to 27.2 C
Choose a selection below:
        1 - Seconds to hours, minutes and seconds
        2 - Fahrenheit to Celsius
        3 - Celsius to Fahrenheit
        4 - Quit
3
Enter a Celsius value: 56
56.0 C is equal to 132.8 F
Choose a selection below:
        1 - Seconds to hours, minutes and seconds
        2 - Fahrenheit to Celsius
        3 - Celsius to Fahrenheit
```


Terminal
Program written by: Anjali Patel
Course info: CS-116 Lab 1:Conversion
Date: Wed Sep 12 20:08:26 2018
Choose a selection below:
1 - Seconds to hours, minutes and seconds
2 - Fahrenheit to Celsius
3 - Celsius to Fahrenheit
4 - Quit
3
Enter a Celsius value: ew
Invalid Input! Please input a numerical value.
30
30 C is equal to 86 F
Choose a selection below:
1 - Seconds to hours, minutes and seconds
2 - Fahrenheit to Celsius
3 - Celsius to Fahrenheit
4 - Quit
4
Thank You for using my program! Have a great day!


Terminal
Program written by: Anjali Patel
Course info: CS-116 Lab 1:Conversion
Date: Wed Sep 12 20:07:46 2018
Choose a selection below:
1 - Seconds to hours, minutes and seconds
2 - Fahrenheit to Celsius
3 - Celsius to Fahrenheit
4 - Quit
90
Please enter in a valid selection
Choose a selection below:
1 - Seconds to hours, minutes and seconds
2 - Fahrenheit to Celsius
3 - Celsius to Fahrenheit
4 - Quit
helloworld
Invalid selection! Please try again
Choose a selection below:
1 - Seconds to hours, minutes and seconds
2 - Fahrenheit to Celsius
3 - Celsius to Fahrenheit
4 - Quit


Terminal
Program written by: Anjali Patel
Course info: CS-116 Lab 1:Conversion
Date: Wed Sep 12 20:11:33 2018
Choose a selection below:
1 - Seconds to hours, minutes and seconds
2 - Fahrenheit to Celsius
3 - Celsius to Fahrenheit
4 - Quit
2
Enter a Fahrenheit value: hello
Invalid Input! Please input a numerical value.
hi
Invalid Input! Please input a numerical value.
2900
2900 F is equal to 1593.3 C
Choose a selection below:
1 - Seconds to hours, minutes and seconds
2 - Fahrenheit to Celsius
3 - Celsius to Fahrenheit
4 - Quit


Terminal
Program written by: Anjali Patel
Course info: CS-116 Lab 1:Conversion
Date: Wed Sep 12 20:12:19 2018
Choose a selection below:
1 - Seconds to hours, minutes and seconds
2 - Fahrenheit to Celsius
3 - Celsius to Fahrenheit
4 - Quit
3
Enter a Celsius value: oops
Invalid Input! Please input a numerical value.
joke
Invalid Input! Please input a numerical value.
90
90 C is equal to 194 F
Choose a selection below:
1 - Seconds to hours, minutes and seconds
2 - Fahrenheit to Celsius
3 - Celsius to Fahrenheit
4 - Quit