**COP 1000C Intro to Programming Concepts**

**Assignment 9**

Write the code using functions. Write a C program that gives user menu to choose from –

1. Convert temperature input from the user in degrees Fahrenheit to degrees Celsius

2. Convert temperature input from the user in degrees Celsius to degrees Fahrenheit

3. Quit.

Formulae- C = (5 / 9) \* (F-32) and F = (9/5) \* C + 32

Need to use functions only to accomplish 1 and 2.

Need to use at least two functions for each scenario and need to call them from the main function. Can use more functions as you see fit.

Test the program with the following values:

68 degree F = 20 degree C

20 degree C = 68 degree F

-22 degree F = -30 degree C

0 degree C = 32 degree F

**Deliverables:**

Paste your code and output from running the program in a word document, and attach it to your submission. Include all the code.

**You will earn a grade of zero if you do not demonstrate the use of functions to do this assignment.**

Include the output from running your program for four test cases to convince the reader that the program is functioning correctly.

Rubric:

1. Use of correctly functioning menu (10 points)

2. Correct use of at least two functions for Scenario 1 (i.e. converting from F to C.) (25 points)

3. Correct use of at least two functions for Scenario 2 (i.e. converting from C to F.) (25 points)

4. Code with appropriate comments (20 points)

5. Four screen shots showing the program works correctly. (20 points)

6. 10 bonus points for using more than four functions (excluding main function) in the entire code.

#include <stdlib.h>

#include <stdio.h>

float calculateCelsius(float temperature);

float calculateFahrenheit(float temperature);

void displayMenu();

int getUserInput();

main() {

float convertedTemp, initialTemp;

int repeat = 1;

do {

displayMenu();

switch (getUserInput()) { // Able to use a method in the switch as it returns a value.

case 1:

printf("What Fahrenheit temperature do you want to convert to Celsius?\n");

initialTemp = getUserInput(); // initialTemp is converted from int to float through implicit conversion.

// Allows one function to have multiple uses.

convertedTemp = calculateCelsius(initialTemp);

printf("%.2lf degrees Fahrenheit is %.2lf degrees Celsius.\n", initialTemp, convertedTemp);

repeat = 0;

break;

case 2:

printf("What Celsius temperature do you want to convert to Fahrenheit?\n");

initialTemp = getUserInput();

convertedTemp = calculateFahrenheit(initialTemp);

printf("%.2lf degrees Celsius is %.2lf degrees Fahrenheit.\n", initialTemp, convertedTemp);

repeat = 0;

break;

case 3:

printf("Quitting application.\n");

repeat = 0;

break;

default:

printf("Please choose a valid option.\n\n");

break;

}

} while (repeat);

system("pause");

}

float calculateCelsius(float temperature) {

float convertedTemp = 0; // Same name, but essentially different variable from 'convertedTemp'

// in main(). Must be "localized" (initialized locally) to this function.

convertedTemp = ((5 \* (temperature - 32)) / 9);

return convertedTemp;

}

float calculateFahrenheit(float temperature) {

float convertedTemp = 0;

convertedTemp = (((9 \* temperature) / 5) + 32);

return convertedTemp;

}

void displayMenu() {

printf("---------------------\n");

printf("Temperature Converter\n");

printf("---------------------\n");

printf("Choose one of the following options:\n\n");

printf("1. Convert Fahrenheit to Celsius.\n");

printf("2. Convert Celsius to Fahrenheit.\n");

printf("3. Quit.\n\n");

}

int getUserInput() {

int userInput;

printf("Selection: ");

scanf\_s("%i", &userInput);

printf("\n");

return userInput;

}

   