Honors Computer Science C++
Mr. Clausen
Program 5A, & 5B

Special Note: Every program from Chapter 4 to the end of the year needs to have functions!

Program 5A: Celsius To Fahrenheit Or Visa Versa 20 points

Write a program to convert a temperature from Celsius to Fahrenheit or from Fahrenheit to Celsius using functions. Save the program as LastNameFirstNameP5A.cpp in your "S:" directory. To see a model for this program look at the source code for the program "P5ASimpleMENU.cpp" in the network directory titled: HonorsCompSciCFiles. Look in the folder, Text Book Programs and Ch5.
As you type all your programs this year, be sure not to type past the 80-column line.

1. Type comments at the beginning of the program to display your name and other information just like those used for program 2A. **Make sure to change the program name and program description in these comments, so that the program number, name, and description say what is listed above.**

2. Include <iostream> so we can use the **cout** and **cin** commands. Include <iomanip> so we can use the **setprecision** command.

3. **Type**: using namespace std;

4. Declare a constant of type **double** for FREEZING_POINT_OF_WATER = 32.0 and use this identifier in your formulas to convert a temperature from Celsius to Fahrenheit or from Fahrenheit to Celsius.

5. Don't forget to include comments for your functions, right before each of your function declarations.

6. Declare the function Display_My_Info( ) in the function declaration section of the program. This should be a void function that doesn't take any parameters and doesn't return any values. In addition, declare functions for Menu_Choice(), Get_Celsius_Temp(), Get_Fahrenheit_Temp(), Celsius_To_Fahrenheit(), Fahrenheit_To_Celsius(), Display_Celsius(), and Display_Fahrenheit(). The Menu_Choice() function should be a value returning function of type **char**. Get_Celsius_Temp(), and Get_Fahrenheit_Temp(), should be **void** functions using reference parameters. Celsius_To_Fahrenheit(), and Fahrenheit_To_Celsius(), should be value returning functions of type **double.** Display_Celsius(), and Display_Fahrenheit() should be a void functions using constant reference

parameters to echo the Celsius or Fahrenheit temperatures and display the results of the calculations for the Celsius or Fahrenheit temperatures.

7. Use a comment line with **equal signs** to separate all of the above from the **int** main function. For example:
   //==

8. Inside the **int** main() function, declare all of your variables then, call the functions: Display_My_Info(), and Menu_Choice(). You will need an "if … then…else" statement after the call to the Menu_Choice() function to decide which functions to call based upon the choice that the user makes. **Don't forget that value-returning functions are "called" in assignment statements, while void functions can be called just by writing the function name including any of the "actual" parameters.** Don't forget your return 0 command.

9. After the **int** main() function, have another comment line of **subtraction signs** to separate the above from your function implementation lines below. For example:
   //--

10. Implement all of the functions, separating each one from the other ones using comment lines of **subtraction signs**. The menu options should look like this:

    Main Menu For Temperature Conversion

    1) Convert Celsius To Fahrenheit
    2) Convert Fahrenheit To Celsius
    Q) Quit the Program.

    Enter Your Choice:

    To change Celsius to Fahrenheit use the formula:
    fahrenheit = 1.8 * celsius + FREEZING_POINT_OF_WATER;

    To change from Fahrenheit to Celsius use the formula:
    celsius = (fahrenheit - FREEZING_POINT_OF_WATER) * 5.0 / 9.0;

11. After the last function implementation of every program, end your program with two comment lines of equal signs. This signifies the end of your source code. For Example:
    //==
    //==

When you are finished with your program, have tested it thoroughly to make sure that your calculations are correct, and are sure that you don't need to make any changes, then save your program in the "T" network mapping, and the Program 5A folder.

Program 5B Grading Scale 20 points

Write a program to determine a letter grade and comment given a percentage grade using functions. Save the program as LastNameFirstNameP5B.cpp in your "S:" directory. To see a model for this program look at the source code for the program "P5ASimpleMENU.cpp" in the network directory titled: HonorsCompSciCFiles. Look in the folder, Text Book Programs and Ch5.
As you type all your programs this year, be sure not to type past the 80-column.

1. Type comments at the beginning of the program to display your name and other information just like those used for program 2A. **Make sure to change the program name and program description in these comments, so that the program number, name, and description say what is listed above.**

2. Include <iostream> so we can use the **cout** and **cin** commands. Include <iomanip> so we can use the **setprecision** command.

3. **Type**: using namespace std;

4. There are no constants to declare.

5. Don't forget to include comments for your functions, right before each of your function declarations.

6. Declare the function Display_My_Info ( ) in the function declaration section of the program. This should be a void function that doesn't take any parameters and doesn't return any values. In addition, declare functions for Get_Data(), Letter_Grade(), Comment(), and Display_Output(). The Get_Data() function should be a void function using a reference parameter of type **double** for the numeric grade named percent. Letter_Grade () should be a value returning function of type **char** that uses a parameter for the percent. Comment() should be a value returning function of type **string** that uses a parameter for the letter grade named, letter_grade and that returns an appropriate comment depending on the letter_grade score. Display_Output() should be a void function using constant reference parameters to echo the percent and letter_grade, and display the comment according to the student's grade.

7. Use a comment line with **equal signs** to separate all of the above from the int main function. For example:

//==========

8. Inside the **int** main() function, declare all of your variables and then call the functions. **Don't forget that value-returning functions are "called" in assignment statements, while void functions can be called just by writing the function name including any of the "actual" parameters.** Don't forget your return 0 command. **For this program, the if…else statements are NOT in the int main function! (See step #10.)**

9. After the **int** main() function, have another comment line of **subtraction signs** to separate the above from your function implementation lines below. For example:
   //----------

10. Implement all of the functions, separating each one from the other ones using comment lines of **subtraction signs**.

11. **You will need extended "if then else" statements in your functions Letter_Grade(), and Comment().**

12. After the last function implementation of every program, end your program with two comment lines of equal signs. This signifies the end of your source code. For Example:
    //==========
    //==========

Use the following cutoffs for each grade in the grading scale:
A 90
B 80
C 70
D 60
F Below 60.

When you are finished with your program, have tested it thoroughly to make sure that your calculations are correct, and are sure that you don't need to make any changes, then save your program in the "T" network mapping, and the Program 5B folder.