60-140-1 and 60-140-2 ASSIGNMENT #3
Handed Out:Thurs. Oct 8, 2015 for (60-140-01 and 60-140-02)
Due: Thurs Oct 22, 2015 for (60-140-01 and 60-140-02)
Total: 50 marks

Objective of Assignment: To write an algorithm and a C program to solve a problem using functions and function calls but no decision or repetition instructions by going through the 6 problem solving steps.

Scope : Assignment covers materials up until end of chapter 4.

Other Things to learn from Assignment : How to make function calls and use of **call-by-value parameters.**

DO NOT USE GLOBAL VARIABLES

Important: Do not forget to type in your ***full name***, ***student number***, ***lecture section number, lab section number*** and ***date*** in BOTH the algorithm and source C program files.

Electronic Assignment Submission:

03-60-140-1 students: email script file to cs140_01@cs.uwindsor.ca with subject including: Name, student id, lecture section, lab [section], assignment #3 (in the subject of the mail submission of script file).

03-60-140-2 students: email script file to cs140_02@cs.uwindsor.ca with subject including: Name, student id, lecture section, lab [section], assignment #3 (in the subject of the mail submission of script file).

*Only the assignments currently due that are submitted to this site within two days before and by the due date, are retrieved for marking. Others are deleted soon after.

CONFIDENTIALITY AGREEMENT & STATEMENT OF HONESTY
I confirm that I will keep the content of this assignment/examination confidential.
I confirm that I have not received any unauthorized assistance in preparing for or doing this assignment/examination. I confirm knowing that a mark of 0 may be assigned for copied work.

______________________________	______________________________
Student Signature	Student Name (please print)
______________________________	______________________________
Student I.D. Number	Date

Problem:
You are required to write an **algorithm and a C program using top-down design**

approach with functions and only Call-by-Value parameters, and showing all 6 problem solving steps to compute and print the following:
Given the conversion rate between degree Celsius (°C) and degree Fahrenheit (°F) is °C = 5.0/9.0 (°F- 32.0 use two functions **Calc_Celsius** (which returns the Celsius equivalent of a Fahrenheit temperature) and **Calc_Fahr** (which returns the Fahrenheit equivalent of a Celsius temperature) to write an algorithm and a program, which prints

(i) the Celsius temperatures of three Fahrenheit temperatures entered at the keyboard by the user as input data, and

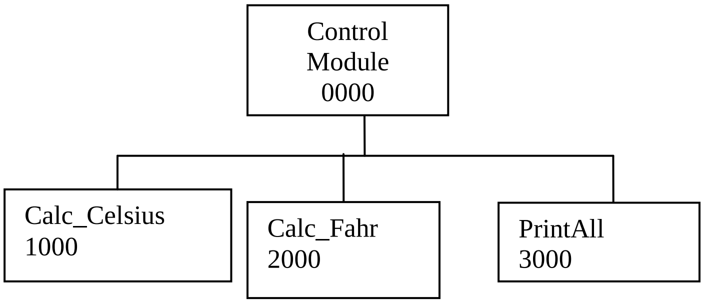
(ii) the Fahrenheit equivalents of three Celsius temperatures entered at the keyboard by the user as input data.

You should print lines of output in a neat tabular form as shown in the sample output, by calling the functions and without using repetition instructions.

All input data should be read in the control or main module.
Calc_Fahr module should calculate the Fahrenheit equivalents.
Calc_Celsius module should be used to calculate the Celsius equivalents.
PrintAll should print all data and tables.

All input data must be read in the control or main module and all results printed by another function dedicated to printing. **Do not use GLOBAL variables and use only call-by-value parameters and the following structure chart for solving the problem.**

******



Sample Input:

```
Please type the three fahrenheit temperatures to be converted to
Celsius:
68  -40  100
Please type the three Celsius temperatures to be converted to
Fahrenheit:
0  -40  20
```

Sample Output:

```
 The Temperature Conversions from Fahrenheit to Celsius are
```

```
  Fahrenheit      | Celsius
 ***********************************
  68.00           | 20.00
  -40.00          | -40.00
  100.00          | 37.78
 *****
The Temperature Conversions from Celsius to Fahrenheit are
  Celsius         | Fahrenheit
 ***********************************
  0.00            | 32.00
  -40.00          | -40.00
  20.00           | 68.00
```

Thank You for Using the UWin_60-140 Temperature Conversion System!!
Have a Nice Day and Come Again !!
**
****

Type all the 6 problem solving steps for solving this problem in a text file called your userid_asn3.txt. Then, type the C program solution into a source file called your userid_asn3.c. Compile your C program with cc userid_asn3.c. Then, run (execute it with ./a.out). When your program is running with no errors, then, create a script file called userid_script3.txt and hand in your script file for marking. Your script file should show all 6 problem solving steps including the algorithm, your source program, the compilation of the program, the running of the program with the input and output data shown. Thus, to get your script file you can do the following:

```
script  userid_script3.txt
cat userid_asn3.txt
cat userid_asn3.c
cc userid_asn3.c
./a.out
(when prompted, type in the input data in the correct order)
exit
```

Once you exit, your script file (userid_script3.txt) has been created and you can hand in your script file for marking.

Marking Scheme :

1.Correct Problem Analysis in Steps 1 and 2 of problem solving ---(5 marks)
2.Correct Algorithm solution in Step 4 -------(5 marks)
3. Correct Program Solution (3 for variable declarations, 2 for function prototypes, 2 for function calls, 6 for function definitions,3 for reading and printing, 4 for correct logic) ----(20marks)
4. Hand tracing the program for testing and evaluation(step 6) ---(5 marks)
5. Error free Compilation of Program (syntax handling) --- (5 marks)
6. Correct Running of the Program with Correct Input/Output Data Format ----(10 marks)