EEE101 C Programming and Software Engineering 1 – ASSESSMENT 3

Assessment Number	3
Contribution to Overall Marks	10%
Issue Date	26/10/2015
Submission Deadline	9/11/2015 at 0900 (9am)

Assessment Overview

This assessment aims at testing some basic concepts of C programming and initiates the routine of code development using the software development process (**SDP**) presented in Lecture 1, namely the five main steps of the software development process:

1. Problem statement: formulate the problem.
2. Analysis: determine the inputs, outputs, variables, etc
3. Design: define the list of steps (the algorithm) needed to solve the problem.
4. Implementation: the C code has to be submitted as a separate file. Just indicate here the name of the file.
5. Testing: explain how you have tested and verified your C program.

You will need to apply this methodology to each one of the following simple exercises.

EXERCISE 1 (10 POINTS OUT OF 10)

A grading system is required to help tutors with their marking. Each students work is graded by 3 tutors, who give the students work an integer score from 0-10. Write a C program that performs the following functions:

1. Accepts the input of the three grades.
2. Ranks the three grades from lowest to highest and prints them on the screen in that order.
3. Finds the mode if two or more numbers are the same, otherwise returns the mean value.
4. Based on the returned value (mode or average), the students' grade should be returned by referring to the table below:

Score	Grade
0-3.9	Fail
4-4.9	Third
5-5.9	Lower Second
6-6.9	Upper Second
7-10	First

Programming Constraints

- Steps 1 and 4 should happen in function main( ).
- Steps 2 and 3 should happen in separate user-defined functions (i.e. you must create a function for each).
- All variables must be local.

Output examples

- Input values: 6 7 6
- Ranked values: 6 6 7
- Mode/Average value: 6
- Grade: Upper second

- Input values 7 5 4
- Ranked values 4 5 7
- Mode/Average value 5.333
- Grade: Lower second

What should be submitted?

You should submit the followings:

1) A short report (up to a few pages of text plus C source codes) detailing for each question:
   a) SDP steps 1 to 3 in the report (Report + Specification + Analysis + Algorithm Design) (40%)
   b) SDP step 4 (Implementation + Robustness): your C source code including the comments. (40%)
   c) SDP step 5 in the report (testing): you will explain how you have tested the correctness of your C program and will include some sample runs of your C Programs. (20%).

Please refer to the file "EEE101 Marking Guidelines Assignments 1-3" on ICE for a detailed marking scheme.

2) The report in Microsoft Word or pdf format and C source code of your implementation should be zipped into a single file, i.e. the zip file will contain **2** files, one report and one source code file. (It is a good practice to include comments in your code stating the aim of the program, what are the inputs, what are the outputs, which algorithm is used, who is the author and so on.)

The naming of Report (.doc or .pdf), Source Code (.c) and Compressed file (.zip, or .rar)

- StudentID_LastName_FirstName_AssignmentNumber-QuestionNumber.docx or .pdf
- StudentID_ AssignmentNumber-QuestionNumber.c
- StudentID_LastName_FirstName_AssignmentNumber.zip or .rar

For example

- 10115085_Zhang_Hanqing_3-1.docx
- 10115085_3-1.c

Zipped together into:

- 10115085_Zhang_Hanqing_3.zip

How the work should be submitted?

Should be submitted electronically through ICE so that the marker can run your programs during marking. Feedback and your grade will also be given through ICE.