EEE101 C Programming and Software Engineering 1 – ASSESSMENT 5

Assessment Number	5
Contribution to Overall Marks	25%
Issue Date	23/11/2015
Submission Deadline	07/12/2015 at 0900 (9am)

Assessment Overview

This assessment aims at testing some concepts of C programming and 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)

I am your customer and I require a database to store student information and grades. For each student I would like to store their:

- Family name (e.g. Lin)
- Given name (e.g. Rui)
- Student ID (e.g. 1234567)
- Email address (e.g. rui.lin@student13.xjtlu.edu.cn)
- 6 Assignment grades (e.g. 60 70 50 20 90 50)
- Average mark

The database should be stored in a text file. On executing the program, I should be presented with the option to create a new database (allowing me to choose the filename) or to open an existing database (allowing me to choose an existing file).

The program should have user-defined functions to provide the following three operations:

1. Add a student

I should be able to add a student's information to my database, which should be stored in a text file.

2. Search for a student's information

I should be able to search for and display a student's information using their student ID, if the student does not exist then the program should tell me they are not in the database.

3. Sort and Print whole database by Student ID

I should be able to select an option to re-order the student information database so that it is stored in order of Student ID and to print the entire content of the sorted database.

A program that provides functionality for **operations 1 and 2** above constitutes **95%** of the programming requirements. The functionality provided by **operation 3** constitutes only **5%** of the program requirements.

Hints

Function main should provide a user menu. Try to make your program user interface look professional.

The prototypes of all of your data is your own choice, though it is strongly recommended that a structure is used

For your report, apply the SDP process to each of the functions in your program

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. (45%)

   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. (15%).

   Please refer to the file "EEE101 Marking Guidelines Assignments 4-5" on ICE for a detailed marking scheme.

2) The report in Microsoft Word or pdf format and C source code of your implementation for each question should be zipped into a single file, i.e. the zip file will contain **2** files, one document and one source code. (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_5-1.docx
- 10115085_5-1.c

Zipped together into:

- 10115085_Zhang_Hanqing_5.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.