SFWRENG 2MP3 – Programming for Mechatronics

Fall 2018

Assignment 6: Pointers, Functions, Structures

Note: Weekly course assignments account for 20% of the final course grade. **This assignment is due November 11th, 2018 at 11:59pm.**

Objectives

The purpose of this activity is to develop a greater understanding of pointers and structures and their application within the C programming language.

Tasks

In order to complete this assignment, you must submit a written report of the C code and output for each of the following questions.

Question 1a: Create a structure for a student at McMaster University, the structure should contain the following:

- First name (character array)
- Last name (character array)
- Student number (integer)
- Program (ex. Mechatronics Engineering) (character array)
- 12-point GPA (floating point)

Question 1b: Create a variable representing a student structure and create a pointer the structure variable. Use pointers to have the user input **valid** data into the structure variable.

Question 1c: Create a function that will return the 4-point GPA for the student data entered into the structure. Print the 4-point GPA to the screen according to the following using pointers:

Example Input:

Please enter the first name of the student: Example

Please enter the last name of the student: Student

Please enter the student number: 123456789

Please enter the program of the student: Mechatronics Engineering

Please enter the 12-point GPA of the student: 9.1

Example Output:

The 4-point GPA of Example Student is 3.4

Question 1d: Create a function that will print all of the student information stored in the student structure to the screen using pointers.

Question 2a: Create a structure for students in SFWRENG 2MP3, the structure should consist of the following:

- First name (character array)
- Last name (character array)
- Student number (integer)
- Course grade (represented as 0-100) (floating point)

Question 2b: Ask the user for the number of students you would like to enter data for and create a corresponding array of structures. Create a loop that will fill the array of structures with the necessary data.

Question 2c: Create a function that will calculate the mean, median and mode of the course grades and print the result to the screen

Question 2d: Create a function that will print the records of all of the students to the screen accordingly:

Student 1: Example Student

Student Number: 123456789

Course Grade: 67.75%