BCS 230: Foundations of Computer Programming II

CRN 23798, 23322, 20108 Spring 2015

Instructor: Dr. Jie Li

Homework 4 – Tuesday, February 17

Due Saturday, February 28, 11:55PM on Angel

Assignment Goals: To learn to manipulate data using structs.

Assignment:

1. Reading: Chapter 9 Records (structs)

2. Write a program that will read students' names and their 10 test scores from a data file. The program should also calculate each student's average score and assign a letter grade to each student. The program should output each student's name, average score, and the relevant letter grade.

You should define a `struct` type named `studentType`, which has five components: `studentFName` and `studentLName` of type `string`, an `int` array `scores` of 10 elements, `average` of type `double`, and `grade` of type `char`. Suppose that the class has 25 students. Use an array of type `studentType` of 25 components to store student data.

Your program should contain at least the following user-defined functions:

a. Function `getData` to read one student's data from the input file into a variable of `struct`. You must pass the file stream as a parameter (by reference). You can modify the book example `getData` function (pp. 613 for the 6th edition or pp. 632 for the 7th edition). Note, the book example reads data into an array of struct, but you should read data into a single variable of struct.

b. Function `getAverage` to calculate the average score of the ten test scores for one student.

c. Function `getGrade` to assign the relevant letter grade to one student based on his/her average score. The letter grade scale is shown as below,

90 <= average <100	A
80<= average < 90	B
70<= average < 80	C
60<= average < 70	D
0 <= average < 60	F

d. Function `printStudent` to print one student's record: first name, last name, average score, and the letter grade.

Your function `main` should make function calls to the above functions for a number of times in order to manipulate records of 25 students. The input data file `hw4data.txt` can be downloaded separately.