BCS 230: Foundations of Computer Programming II

CRN 23798, 23322, 20108 Spring 2015

Instructor: Dr. Jie Li

Homework 5 – Tuesday, March 3

Due Saturday, March 14, 11:55PM on Angel

Objective: To learn to define and implement classes, and place class definition and class implementation in separate files; To learn to use classes and objects to manipulate data.

Task:

Redo homework 4 using classes. Write a program that will read students' names and their 10 test scores from an input file named "`hw5data.txt`". The program should calculate each student's average score and assign a letter grade to each student. The program should output each student's name, ten test scores, average score, and the relevant letter grade.

Your program should define a class `studentType` and implement it. The class `studentType` consists of five private member variables:
`studentFName` and `studentLName` of type `string`, an `int` array `scores` of ten components, `average` of type `double`, and `grade` of type `char`.

The class `studentType` should also include the following public member functions:

1. A default constructor to initialize `studentFName` and `studentLName` to empty string, ten test scores to zero, `average` to 0.0, and `grade` to the blank character.
2. `setStudent` to read a student's first name, last name, and 10 test scores from a data file. You must pass the file stream variable as a reference parameter.
3. `getFName` to return a student's first name.
4. `getLName` to return a student's last name.
5. `getAverage` to calculate the average of ten test scores, and return it.
6. `getGrade()` to find the letter grade based on the student's average score and return the grade.
7. `printStudent` to output a student's first name, followed by a space, followed by last name, and followed by ten test scores, average, and letter grade. Align students' name, ten test scores, average, and letter grade.

Suppose that the input data file contains the records of 25 students. Use an array of 25 objects of class `studentType`.

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

The hw5data.txt file should be downloaded separately.

You should submit three files:

the header file **`studentType.h`**,

the class implementation file **`studentType.cpp`**, and

the test program **`hw5main.cpp`**.

Please attach three source files. No zip file. No Doc file.

Be sure to include your name, ID, and CRN, and the statement of your original work.