

Assignment 1

Objective:

This assignment is to create a simple Console application using XCode and Objective-C. The application will gather students through the interactive console and able to display the information back on the screen.

Requirement:

1. The program will prompt the user via the console to read in:
 - a. Student First Name
 - b. Student Last Name
 - c. Student CWID
2. The program will loop and prompt the user via the console to read in:
 - a. The course name that they are taken
 - b. The score weights percentage for Home Work, Midterm, and Final
 - c. The actual average Homework score, Midterm score, and final Score
3. The program must be able to output on the console the following:
 - a. Student's Name and CWID
 - b. The average score for each course taken by the student

Issue/Limitation:

1. The program will assume that user will actually enter CWID up to nine numbers.
2. The program will assume that the total score is between 0 and 300
3. The program will assume that the total weights must be equal to 100%
4. The program does not limit the number of courses taken by students

Design:

I chose to create two classes.

The first class is DHDCourse, which will hold the name of the course, its weights, and its scores. The class has two main methods.

The first method is to calculate the average scores based on the input weights and scores.

The second method is to display the course information including the course name and the calculated average score.

The second class is DHDDStudent, which will hold first name, last name, and CWID for a given student. This class also has a private dictionary to store all the courses the student enrolled. There are three main methods.

First is a class method called createStudentFromPrompt. This method will use the interactive prompt from the console to gather the student information such as name and CWID and create the appropriate Student object.

The second method is `addCoursesFromPrompt`. This method is called by the student object and allow user to add courses that the student enrolled along with its weights and its average scores from the interactive console.

The third method is `showStudentInfo`. This method is call by the student class which allow it to display the student information on the console.

Program Flow:

The driver program should perform the following:

- The program will call the class method `createStudentFromPrompt` on `DHDStudent`:
 - o The program will prompt the user to input First Name, Last Name, and CWID.
 - o The program will read in the input using `scanf` into 3 C string variables
 - o The program will allocate memory and create a student object with the above information
- The student object can now call `addCoursesFromPrompt`
 - o The program will prompt for the course name and its weights of Homework, Midterm, Final
 - o The program will create and initialized the `DHDCourse` object
 - o The student object then calls `enrolledCourse` method to enroll the course
 - o The program will prompt for the course's Homework Average score, Midterm, Final
 - o The student object then calls `updateCourseScore` method to update the input scores for the given course.
- The student can call `showStudentInfo` to display information
 - o Output the student Full Name in the `FirstName LastName` format
 - o Output the student CWID
 - o Loop through the dictionary. For each course found in the dictionary:
 - Tell the course object to call `showCourseInfo` to display the Course Name and its average score
- The program will loop if user request to run it again
- The program terminates.

Test Case:

Student: Ted Williams CWID: 123456789 Course: CPSC211 Weights: HW = 15%, Midterm = 35%, Final = 50% Scores: HW = 89.5, Midterm = 90, Final = 92.5 Course: CPSC343 Weights: HW = 25%, Midterm = 35%, Final = 40% Scores: HW = 89.5, Midterm = 90, Final = 92.5	Result: Student Name: Ted Williams CWID: 123456789 Course: CPSC211 Course Overall grade: 91.175 Course: CPSC343 Course Overall grade: 90.875
--	--

Student: John Doe CWID: 987654321 Course: CPSC411 Weights: HW = 40%, Midterm = 25%, Final = 35% Scores: HW = 89.5, Midterm = 90, Final = 92.5 Course: CPSC456 Weights: HW = 30%, Midterm = 30%, Final = 40% Scores: HW = 89.5, Midterm = 90, Final = 92.5	Result: Student Name: John Doe CWID: 987654321 Course: CPSC411 Course Overall grade: 90.675 Course: CPSC456 Course Overall grade: 90.85
--	---

Program Run Result:

Below is the program run result of the first Student entered:

```

2016-09-18 14:24:04.717 Assignment1[1508:320380] Enter Student Full Name and CWID. Example: David Dang 12345
Ted
Williams
123456789
2016-09-18 14:24:30.975 Assignment1[1508:320380] Enter register Course Name and its HomeWork, Midterm, Final Weight.
2016-09-18 14:24:30.975 Assignment1[1508:320380] Make sure total Weight is 100. Example: CPSC411 20 30 50
CPSC211
15
35
50
2016-09-18 14:24:50.231 Assignment1[1508:320380] Enter Course's Scores of HomeWork Average, Midterm, and Final. Example: 75.5 78 88
89.5 90 92.5
2016-09-18 14:25:06.050 Assignment1[1508:320380] Do you want to add more course? (Y/N)
Y
2016-09-18 14:25:08.283 Assignment1[1508:320380] Enter register Course Name and its HomeWork, Midterm, Final Weight.
2016-09-18 14:25:08.283 Assignment1[1508:320380] Make sure total Weight is 100. Example: CPSC411 20 30 50
CPSC343
25 35 40
2016-09-18 14:25:16.682 Assignment1[1508:320380] Enter Course's Scores of HomeWork Average, Midterm, and Final. Example: 75.5 78 88
89.5
90
92.5
2016-09-18 14:25:29.669 Assignment1[1508:320380] Do you want to add more course? (Y/N)
n
2016-09-18 14:25:31.281 Assignment1[1508:320380] Student Name is: Ted Williams
2016-09-18 14:25:31.281 Assignment1[1508:320380] Student CWID: 123456789
2016-09-18 14:25:31.281 Assignment1[1508:320380] List of enrolled courses and grades:
2016-09-18 14:25:31.281 Assignment1[1508:320380]
2016-09-18 14:25:31.281 Assignment1[1508:320380] Course Name: CPSC211
2016-09-18 14:25:31.282 Assignment1[1508:320380] Course's Overall Grade: 91.175000
2016-09-18 14:25:31.282 Assignment1[1508:320380] Course Name: CPSC343
2016-09-18 14:25:31.282 Assignment1[1508:320380] Course's Overall Grade: 90.875000
2016-09-18 14:25:31.282 Assignment1[1508:320380] Do you want to enter another student? (Y/N)

```

Below is the program run result of the second Student:

```
y
2016-09-18 14:26:16.449 Assignment1[1508:320380] Enter Student Full Name and CWID. Example: David Dang 12345
John
Doe
987654321
2016-09-18 14:26:28.862 Assignment1[1508:320380] Enter register Course Name and its HomeWork, Midterm, Final Weight.
2016-09-18 14:26:28.862 Assignment1[1508:320380] Make sure total Weight is 100. Example: CPSC411 20 30 50
CPSC411 40 25 35
2016-09-18 14:26:38.441 Assignment1[1508:320380] Enter Course's Scores of HomeWork Average, Midterm, and Final. Example: 75.5 78 88
89.5 90
92.5
2016-09-18 14:26:49.307 Assignment1[1508:320380] Do you want to add more course? (Y/N)
Y
2016-09-18 14:26:52.354 Assignment1[1508:320380] Enter register Course Name and its HomeWork, Midterm, Final Weight.
2016-09-18 14:26:52.354 Assignment1[1508:320380] Make sure total Weight is 100. Example: CPSC411 20 30 50
CPSC456
40 40 40
2016-09-18 14:27:06.281 Assignment1[1508:320380] Invalid total Weight for the course. Please re-enter
2016-09-18 14:27:06.281 Assignment1[1508:320380] Enter register Course Name and its HomeWork, Midterm, Final Weight.
2016-09-18 14:27:06.282 Assignment1[1508:320380] Make sure total Weight is 100. Example: CPSC411 20 30 50
CPSC456
30 30 40
2016-09-18 14:27:16.136 Assignment1[1508:320380] Enter Course's Scores of HomeWork Average, Midterm, and Final. Example: 75.5 78 88
89.5 90 92.5
2016-09-18 14:27:26.482 Assignment1[1508:320380] Do you want to add more course? (Y/N)
n
2016-09-18 14:27:28.635 Assignment1[1508:320380] Student Name is: John Doe
2016-09-18 14:27:28.636 Assignment1[1508:320380] Student CWID: 987654321
2016-09-18 14:27:28.636 Assignment1[1508:320380] List of enrolled courses and grades:
2016-09-18 14:27:28.636 Assignment1[1508:320380]
2016-09-18 14:27:28.636 Assignment1[1508:320380] Course Name: CPSC411
2016-09-18 14:27:28.636 Assignment1[1508:320380] Course's Overall Grade: 90.675000

2016-09-18 14:27:28.636 Assignment1[1508:320380] Course Name: CPSC456
2016-09-18 14:27:28.636 Assignment1[1508:320380] Course's Overall Grade: 90.850000

2016-09-18 14:27:28.636 Assignment1[1508:320380] Do you want to enter another student? (Y/N)
,
```