

MTRE 2610 – Engineering algorithms and visualization – Dr. Kevin McFall

Homework – Structures

1. Complete implementations for the `student` member functions given the structure below in order to compute the GPAs for two students. The `credit` and `grade` data member arrays hold the number of credits for each course taken and its corresponding letter grade, respectively. The data member `numCourses` indicates how many of the 100 array elements contain valid data, i.e. the number of courses the student has completed.

The member function `setGrades` is passed arrays of length `numIn` containing the number of credits and letter grades for each of the `numIn` courses. The function should store this information in the data members.

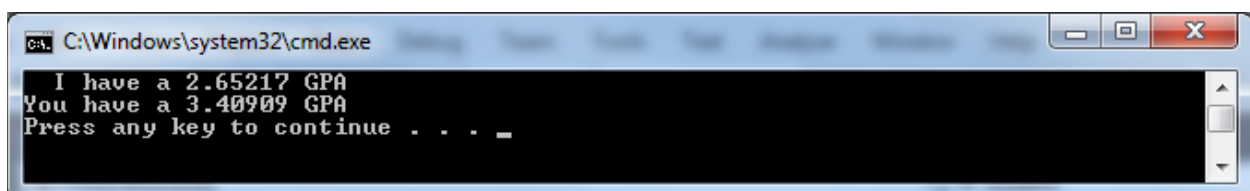
The member function `addGrade` is passed a single course, with its corresponding number of credits and letter grade, to be appended to whatever information is already stored in the data members.

The member function `getGPA` will loop through all the course information stored in the data members and return the student's current GPA.

```
#include <iostream>
using namespace std;

struct student {
    int credit[100], numCourses;
    char grade [100];
    void setGrades(int creditIn[], char gradeIn[], int numIn);
    void addGrade (int creditIn , char gradeIn );
    double getGPA();
};

int main() {
    const int numStart = 5;
    int startCredit[numStart] = { 3 , 4 , 3 , 2 , 4 };
    char startGrade [numStart] = { 'A', 'A', 'B', 'C', 'B' };
    student me, you;
    me.setGrades(startCredit, startGrade, numStart);
    you.setGrades(startCredit, startGrade, numStart);
    me.addGrade(4, 'C'); me.addGrade(3, 'F');
    you.addGrade(2, 'B'); you.addGrade(4, 'A');
    cout << " I have a " << me.getGPA() << " GPA" << endl;
    cout << "You have a " << you.getGPA() << " GPA" << endl;
    return 0;
}
```



The screenshot shows a Windows command prompt window titled "C:\Windows\system32\cmd.exe". The output of the program is displayed as follows:

```
I have a 2.65217 GPA
You have a 3.40909 GPA
Press any key to continue . . . _
```