CS 42 C++ Programming Essentials:

Homework 12:

Create a new project directory called **Homework12**. Copy the Student.cpp and Student.h from Homework directory of Homework 11 to this directory. Copy the student.txt to this directory and change the file name to student5.txt.

The content of this file is:

Adam Smith
1 A Street, CA 90007
98 67 85 42 90
Brian Taylor
2 B Street, CA 90007
45 86 95 73 58
Carol Winston
3 C Street, CA 90007
62 35 99 78 98
Diana Young
4 D Street, CA 90007
94 88 88 93 92
Ellen Zambrano
5 E Street, CA 90007
78 89 66 93 84

Then, copy the student5.txt to student3.txt. Open the student3.txt delete the first and last student. This file will only have 3 students.

1. Now write a program with the following features.
   First, ask use for a file name to read in. (This file should have a few student records.)
   Then, read in the student records one by one into our student structure.
   All these student record (struct) should be put into a vector list.

   After all student record are read in, please all of the student records from the student vector.

2. Calculate their individual GPA.
   90+ - A for 4
   80+ - B for 3
   70+ - C for 2
   60+ - D for 1
   59- - F for 0

After that, calculate the average score for all student for all subjects.

3. The expected result should look like the following picture: (Mainly modifying your homework 11 to homework 12. From a fixed size 1-D data structure to a flexible size 1-D data structure.)
   Note: Your may use Chapter 11 project or the **processScore** program example in chapter 12. As reference.
   Also, to check if a file still has data, you just use

```
getline(file, name);
getline(file, address);
file >> math >> eng >> chem >> hist >> pe;
file.ignore(1, '\n');
while (file){
    s = {name, address, math, eng, chem, hist, pe};
    slist.push_back(s);
    getline(file, name);
    getline(file, address);
    file >> math >> eng >> chem >> hist >> pe;
    file.ignore(1, '\n');
}
```

   You may also group the get student information parts into a function.

```
getRecord(file, name, address, math, eng, chem, hist, pe);
while (file){
    s = {name, address, math, eng, chem, hist, pe};    // put the
    slist.push_back(s);
    getRecord(file, name, address, math, eng, chem, hist, pe);
}
```

   Write your own getRecord() function.

   To get student records to your Student structs.

```
Enter your student file name: student5.txt
Number of students is 5
Student Record
Name: Adam Smith         Address: 1 A Street, CA 90007
M: 98.00, E: 67.00, C: 85.00, U: 42.00, P: 90.00Total:    382.00  Average:  76.40
GPA: 2.40

Student Record
Name: Brian Taylor         Address: 2 B Street, CA 90007
M: 45.00, E: 86.00, C: 95.00, U: 73.00, P: 58.00Total:    357.00  Average:  71.40
GPA: 1.80

Student Record
Name: Carol Winston         Address: 3 C Street, CA 90007
M: 62.00, E: 35.00, C: 99.00, U: 78.00, P: 98.00Total:    372.00  Average:  74.40
GPA: 2.20

Student Record
Name: Diana Young         Address: 4 D Street, CA 90007
M: 94.00, E: 88.00, C: 88.00, U: 93.00, P: 92.00Total:    455.00  Average:  91.00
GPA: 3.60

Student Record
Name: Ellen Zambrano         Address: 5 E Street, CA 90007
M: 78.00, E: 89.00, C: 66.00, U: 93.00, P: 84.00Total:    410.00  Average:  82.00
GPA: 2.60

Average Math: 75
Average Eng: 73
Average Chem: 87
Average Hist: 76
Average PE: 84
```

4. For the 3-student file student3.txt, the expected results should be:

```
Enter your student file name: student3.txt
Number of students is 3
Student Record
Name: Brian Taylor         Address: 2 B Street, CA 90007
M: 45.00, E: 86.00, C: 95.00, U: 73.00, P: 58.00Total:    357.00  Average:  71.40
GPA: 1.80

Student Record
Name: Carol Winston         Address: 3 C Street, CA 90007
M: 62.00, E: 35.00, C: 99.00, U: 78.00, P: 98.00Total:    372.00  Average:  74.40
GPA: 2.20

Student Record
Name: Diana Young         Address: 4 D Street, CA 90007
M: 94.00, E: 88.00, C: 88.00, U: 93.00, P: 92.00Total:    455.00  Average:  91.00
GPA: 3.60

Average Math: 40
Average Eng: 42
Average Chem: 56
Average Hist: 49
Average PE: 50
```