CST 238 Spring 2020, Dr. Gross, CSUMB

Homework 6: Big 3

Due: Tuesday, April 8, 11:55pm

How to turn in:

- Write two programs and submit them on iLearn
- The names are in the assignment; ***INCORRECT NAMES WILL BE GRADED AS 0***

Part 1. Dynamic Memory and Classes (20 pts)

Write a C++ that calculates GPAs based on user input. Have the user enter the total number of classes taken, then for each class, how many credits and what the grade was. Then, for each class:

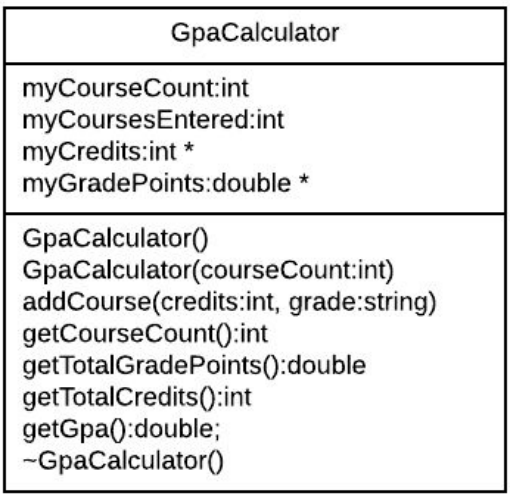
1. Convert the grade to a number of grade points (e.g., A == 4.0, A- = 3.67, B+ == 3.33, etc.)
2. Multiply the grade points by the number of credits for that class
3. Sum up all of the grade points for all classes
4. Sum up all of the credits for all classes
5. Divide the total grade points by the total credits to calculate the GPA

For example, let's say you took four classes and received the following grades:

Course	Credits	Letter Grade	Grade Point Value	Grade Points
CST100	4	A-	3.67	14.68
CST101	3	B+	3.33	9.99
ENG100	3	C	2.0	6.0
UBW101	2	F	0.0	0.0

To calculate your GPA, we sum the credits (12) and the grade points (30.67), then divide the grade points by the credits (30.67/12), and get 2.55583.

The homework must use a class called GpaCalculator, declared as follows, along with a helper function and data for converting letter grades to grade points. Base code is on iLearn.



Here's a sample run of the program:

```
./main
Enter number of courses: 4
Enter number of credits for course 1: 4
Enter grade for course 1: A-

Enter number of credits for course 2: 3
Enter grade for course 2: B+

Enter number of credits for course 3: 3
Enter grade for course 3: C

Enter number of credits for course 4: 2
Enter grade for course 4: F

You earned 30.67 grade points over 12 credits
Your GPA is: 2.55583

Deleting credits dynamic array
Deleting grade points dynamic array
```

Final Notes:

- Read the sample run carefully to understand the requirements of the problem correctly
- Only the definition file (`GpaCalculator.cpp`) should be turned in
- The `GpaCalculator.cpp` file should NOT HAVE ANY IO in the final version (no `cout` or `cin`)
- Test your code thoroughly, because we will!

Part 2. Sorting Vectors (5 pts)

Write a program to read in strings from an input file called `f1.txt`, store in a vector, print them, sort them, and print the sorted vector. Here's a sample file and run:

```
hello
is
it
me
you're
looking
for
```

```
Enter a filename: f1
Words:
    hello
    is
    it
    me
    you're
    looking
    for

Sorting!
Words:
    for
    hello
    is
    it
    looking
    me
    you're
```

Here's another:

```
1
3
5
7
9
21
23
25
27
29
41
43
45
47
49
```

```
Enter a filename: f2
Words:
    1
    3
    5
    7
    9
    21
    23
    25
    27
    29
    41
    43
    45
    47
    49

Sorting!
Words:
    1
    21
    23
    25
    27
    29
    3
    41
    43
    45
    47
    49
    5
    7
    9
```

What kind of order is this? What about capital vs. lowercase letters? You don't have to provide answers *now*...

Final Notes:

- Read the sample run carefully to understand the requirements of the problem correctly
- While the program should always read from a file called `f1.txt`, you should try it with several different file contents before submitting
- This program should be uploaded to iLearn as `hw06-2.cpp`