CS2400 Lab # 4 June 4, 2019

Grade Frequencies (100 points)

Topics Covered:

File streams, loops, if statements, value-returning functions, void functions.

Step 1: Set up a separate directory for this lab.

First create a subdirectory called `lab4`.

a. Type `cd 2400/Labs`
b. Type `mkdir lab4`
c. Type `cd lab4`

Step 2: Program

Write a C++ program that repeatedly inputs students' scores and determines the letter grades. The scores should be stored in a file called "`scores.txt`". For each score, output the score along with its letter grade. Your program should count the number of A's, B's, etc. Use five counters (*aCount, bCount, etc*). See main program below.

The letter grade is determined based on the following scale:

>= 90 (A), >= 80 (B), >= 70(C), >= 60(D), >= 0(F).

Output all frequencies.

Your program *must*, at least, include the following functions:

- A function (*get*Grade) that takes a score as a parameter and returns a letter grade.
  - `char getGrade(double score); //prototype`
- A void function to print the score and the grade.
  - `void printGrade(double score, char grade);`
- A void function to print the frequencies.

```
void printFrequencies(int aCount, int bCount,
                      int cCount, int dCount, int fCount);
```

Main Program:

```
int main() {
     double score;
     int aCount = 0, bCount = 0, cCount = 0, dCount = 0, fCount = 0;


     //open the file for input
     //get the first score
     while(not end of file) {
          char grade = getGrade(score);
          //output the score and the grade
          //determine which counter is updated
          //get the next score
     }

     //output the frequencies
}
```

Submit your program on Blackboard.

Grade Frequencies (100 points)

Sample Input File:

```
44 55 66 77 88 99 50
60 70 80 90 78.5 99.5
```

Sample output:

```
Score: 44.0, Grade: F
Score: 55.0, Grade: F
Score: 66.0, Grade: D
Score: 77.0, Grade: C
Score: 88.0, Grade: B
Score: 99.0, Grade: A
Score: 50.0, Grade: F
Score: 60.0, Grade: D
Score: 70.0, Grade: C
Score: 80.0, Grade: B
Score: 90.0, Grade: A
Score: 78.5, Grade: C
Score: 99.5, Grade: A

Grade  Frequency
----------------
  A        3
  B        2
  C        3
  D        2
  F        3
```