CS2400 Lab # 3

Grade Frequencies (100 points)

Topics Covered:

If statements, value-returning functions, void functions.

Program

Write a C++ program that repeatedly inputs students' scores and determines the letter grades. The program should stop processing scores when the user enters a negative value. 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* 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);
```

If you like, you may add another function that updates the appropriate counter based on the grade. (**Hint**: send the grade and all the counters to the function and use reference parameters for all the counters).

Main Program:

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



     //get the first score
     while(Enter a condition here) {
          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.

CS2400 Lab # 3

Grade Frequencies (100 points)

Sample scores:

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

Sample output (Input prompt will be displayed before each output line):

```
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
```

Grading:

- (20 points) for each of the required functions
- (10 points) The loop works as expected
- (20 Points) The output is clear and accurate
- (10 Points) Coding style