COMP 233
Assignment 1 Formal Specifications
Due: 9:10PM, Wednesday, September 26, 2018

This assignment is based on Programming Project #3 (p. 62) at the end of the Preliminary Chapter of the textbook.

Additional specification are as follows:

1) The input file format is as shown on Page 2, where each line contains a comma separate list of values, where the first value is the student name, the second value is the number of test scores for that student, and the rest of the values are the scores. Sample input is available in my instructor folder as TestData.txt. Your program should work for a data file containing any number of students (one per line) and any number of test scores for a particular student. You should NOT assume that there are always going to be ten students, nor should you assume that the number of scores for any student will always be less than a given number.

2) The screen output that should be produced should be as shown in the screen capture on page 2, where each line will consist of the student name, a calculated average percentage displayed with 2 decimal digits, and a letter grade. All columns should be professionally aligned. A header row should be displayed above the data. The grades should be determined by using the standard 90-80-70-60 scale. If no scores are available for the student, then the average should be 0.00, and the grade should be F.

3) The file output that should be produced should be as shown on page 3. Specifically it should include the student name, the calculated average (2 decimal places), the letter grade, and then the raw data that was included in the input file. As before, a header row should be displayed above the data, and all columns should be professionally aligned as shown in the example output on page 3.

4) For full credit, your program MUST create and initialize a dynamic (heap-based) C-style array of doubles of the appropriate size for each student (unless, of course, the number of scores is zero.) All allocated memory MUST be appropriately released.

5) Your program must include the following C++ function:
   a function to calculate the average percentage called calculateAverage.
   Its return type should be a double (the calculated average) while the parameter list should contain two parameters, 1) a constant pointer to a constant double parameter, which will be the starting location of the array in heap memory, and 2) an int, which will be the size of the array. The implementation should be to add up the scores in the array, divide the number of scores to calculate the average, and return it.

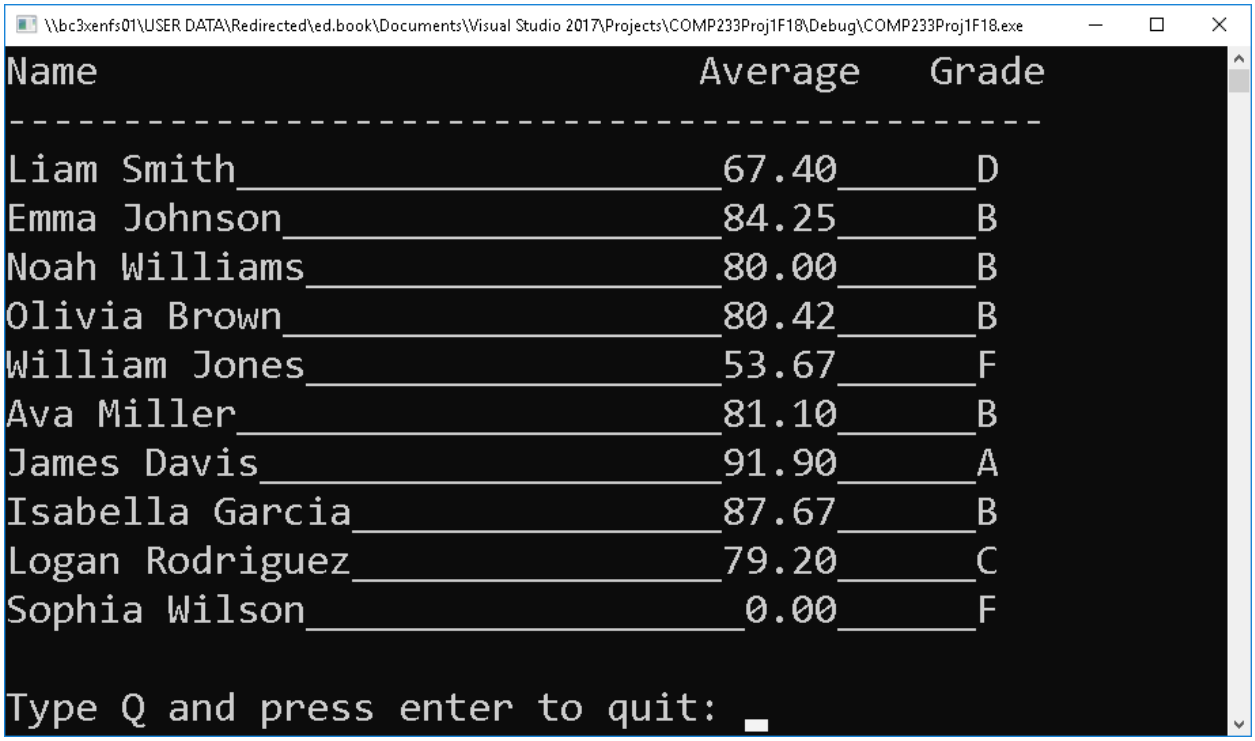
Submit the following:

1) Paper printouts of
   a. Your source code
   b. Your output file, and
   c. A screen shot of your screen output.
2) Blackboard submission of a compressed folder (.zip) file containing your source code.

Input Data File Format

```
Liam Smith, 5, 87, 52, 35.5, 78, 84.5
Emma Johnson, 4, 92.5, 87, 73, 84.5
Noah Williams, 5, 73.5, 82, 87, 64, 93.5
Olivia Brown, 6, 87.5, 77, 72, 83, 91, 72
William Jones, 3, 42, 63, 56
Ava Miller, 5, 75, 69, 84, 92, 85.5
James Davis, 5, 100, 84.5, 92, 95, 88
Isabella Garcia, 6, 93, 77, 82, 94, 91, 89
Logan Rodriguez, 5, 87, 79, 64, 81, 85
Sophia Wilson, 0
```

Sample Screen Capture



Sample output to the output file.

Name	Average	Grade	Data
Liam Smith	67.40	D	5, 87, 52, 35.5, 78, 84.5
Emma Johnson	84.25	B	4, 92.5, 87, 73, 84.5
Noah Williams	80.00	B	5, 73.5, 82, 87, 64, 93.5
Olivia Brown	80.42	B	6, 87.5, 77, 72, 83, 91, 72
William Jones	53.67	F	3, 42, 63, 56
Ava Miller	81.10	B	5, 75, 69, 84, 92, 85.5
James Davis	91.90	A	5, 100, 84.5, 92, 95, 88
Isabella Garcia	87.67	B	6, 93, 77, 82, 94, 91, 89
Logan Rodriguez	79.20	C	5, 87, 79, 64, 81, 85
Sophia Wilson	0.00	F	0