CSC 2262, Fall 2021, Lab 5

Write a MATLAB program that reads a data file (Lab5.dat), where each line contains a student's ID, the student's grades on Exam 1, Exam 2, the Final Exam and the Lab, the student's current quality points earned, and the student's current semester hours earned. For each student, the program will do the following:

1) Calculate the semester grade as follows:
Exam 1 counts 25% of the semester grade.
Exam 2 counts 25% of the semester grade.
The Final Exam counts 35% of the semester grade.
The Lab counts 15% of the semester grade.

2) Calculate the quality points for this course as:
Quality Points = 3*ceil((semester grade - 59)/10)

3) Calculate the total quality points as the quality points already earned plus the quality points for this course.

3) Calculate the total semester hours as the semester hours already earned plus the semester hours for this course which is 3.

5) Calculate the GPA as total quality points divided by total semester hours.

6) Print the array of student IDs, the array of semester grades, and the array of GPAs.

7) Calculate and print the average and the standard deviation of the semester grades and the GPAs.

The average of the elements in an array is the sum of the elements in the array divided by the number of elements in the array.

The standard deviation of the elements in an array named a is given by:

$$\sqrt{\frac{n\sum a_k^2 - \left(\sum a_k\right)^2}{n(n-1)}}$$

where

n is the number of elements in the array a

$\sum a_k$ **is the sum of the elements in the array a**

$\sum a_k^2$ **is the sum of the squares of the elements in the array a**

HINT: To get the sum of the squares of the elements in the array a, first create a new array that contains the squares of the elements in the array a, and then sum the elements in this new array.

NOTE: To sum the elements in an array, use the sum function. For example, the sum of the elements in an array named a is given by sum(a).

NOTE: To print an array, put the name of the array on a line by itself with no semicolon after it

NOTE: <u>DO NOT USE ANY LOOPS IN THIS PROGRAM.</u>

The output of this program should look like this:

```
ID =
        4681
        5932
        7456
        2814
        3267
        9548
        6375
        8193
grade =
   74.4500
   92.4500
   63.4500
   82.3500
   73.7500
   86.8500
   92.2500
   86.0000
GPA =
    2.1250
    3.3750
    1.3721
    2.4250
    2.3143
    3.3929
    3.7931
    3.2000

Semester Grade:  Average = 81.44   Standard Deviation = 10.15
GPA:  Average = 2.750   Standard Deviation = 0.818
```