

## Unit Five Assignment One:

Write a Java project (Application) with just a driver class. This class should have a main method that will only call the default constructor. This default constructor will determine the correlation between two integer arrays. The first array is the list of AP Computer Science Exam scores earned by Iowa City West students on the 2010 exam.

```
int[] apExam = {4,5,5,5,3,2,5,4,5,4,3,4,5,4,4,5,4};
```

The second array is the list of grades (5 = A, 4 = B, 3 = C, etc.) earned by the same Iowa City West students in their AP Computer Science class.

```
int[] grades = {5,5,5,5,4,4,5,3,5,4,4,5,5,4,4,5,4};
```

This class should also have a mean method that will return the average score, as a double, of an array of integer scores sent to it.

$$\text{Average} = \left( \sum_{i=1}^n x_i \right) / n$$

This class should also have a standardDev method that will return the standard deviation, as a double, of an array of integer scores sent to it.

$$\text{Standard Deviation} = \sqrt{\left( \sum_{i=1}^n (x_i - \bar{x})^2 \right) / n} \quad \bar{x} = \text{mean}$$

The correlation between 2 sets of numbers is given by the following formula:

$$\text{Correlation} = \frac{\sum_{i=1}^n ((x_i - \bar{x})(y_i - \bar{y}))}{(n - 1)S_x S_y}$$

$\bar{x}$  = mean of x     $\bar{y}$  = mean of y     $S_x$  = Standard Deviation of x  
 $S_y$  = Standard Deviation of y

The output should look like this:

**Mean of AP Exams = 4.18**  
**Mean of Grades = 4.47**

**Standard Deviation of AP Exams = 0.86**  
**Standard Deviation of Grades = 0.61**

**Correlation = 0.67**