# statistics

**Create a new project, SingleDimensionalArrays.**

**Create a class called, Statistics.java**

Your constructor will have one parameter that takes in an array containing a large (*N* <= 1000) number of integers in the constructor. The integers range in value from 0 to 100.

Due to the potential for the sum of the numbers to be very large, you should use a long integer in your calculation to find the average.

The number of integers in the array is unknown.

Your program must find the sum.

**public long findSum()**

Your program must find the average.

**public double findAverage()**

Your program must find the standard deviation.

**public double standardDeviation()**

Calculating the standard deviation consists of the following steps:

**Step 1:** Find the average of the list of numbers.

**Step 2:** Determine the difference of each number from the average, and square each difference.

Sum all the differences.

**Step 3:** Divide this sum by (the number of values - 1).

**Step 4:** Take the square root of the above division problem from step 3.

Example, given this list of numbers:

7 4 5 9 10

**Step 1:** Find the average of the list of numbers.

The average = 7

**Step 2:** Sum of square of differences

(7 - 7)2 + (4 - 7)2 + (5 - 7)2 + (9 - 7)2 + (10 - 7)2

0 + 9 + 4 + 4 + 9 = 26

**Step 3:** Divide this sum by (the number of values - 1).

= 6.50

**Step 4:** Take the square root of the above division problem from step 3.

= 2.55

For a normal distribution, 68.3% of the data will lie within one standard deviation of the average, while 95.4% will lie within two standard deviations.

**Assignment:**

Your program should print out the average and standard deviation of the data in the array.