UNBC Laboratory Assignment
Computer Science 100—Fall 2011

Outrageous Fortunes and Outliers

Purpose:

To gain more practice with arrays.

Due Date:

The completed lab assignment is due Wednesday 2011-11-30 *at the beginning of lecture*.

A `Fortune` Class

Write a class `Fortune` that has a

```
public static String getFortune() { ... }
```

method. It should produce strings like "`Beware of icy roads!`".
To accomplish this, your class should have a

```
private static String [] theFortunes  = { ... } ;
```

member variable that contains all of the possible fortunes, and a

```
private static java.util.Random randomNumberGenerator ;
```

The `getFortune` method can use the `randomNumberGenerator.nextInt` method (see the documentation).

A `Fortune` Class test program

Write a test program that uses your `getFortune` method as follows. The command-line used to run a JAVA program is partly available through the array passed to

```
public static void main(String [] args) ...
```

so "`java Fortune Roberta fred Gertrude`" will have

```
args[0] == "Roberta" ;
args[1] == "fred" ;
args[2] == "Gertrude" ;
```

⇒ Use this fact to create a program that offers fortunes for each of the people listed in its arguments. For instance, "`java Fortune Omid David Erin`" might produce:

```
Omid: Beware of the icy roads!
David: You will get stuck in a for-loop!
Erin: by induction, you will live happily ever after.
```

Finding outliers

Write a program that has the following methods:

```
public static double [] askUserForArray() { ... }
public static double mean(double array [] data) { ... }
public static double standardDeviation(double array [] data) { ... }
```

where

- the `askUserForArray` method asks the user for a size, and then for individual items of a `double` array, and returns the corresponding array.
- the `mean` function computes the average of an array, defined by the formula

$$\bar{a} = \left(\sum_{i=0}^{n-1} a_i\right)/n. \tag{1}$$

- the `standardDeviation` function computes the *sample* standard deviation, computable by

$$\sigma_a = \frac{\left(\sum_{i=0}^{n-1} a_i^2\right) - \left(\sum_{i=0}^{n-1} a_i\right)^2/n}{n-1}. \tag{2}$$

⇒ Write a test program that tests all three of your methods.