Assignement 8 - Statistics

CS1400 Summer 2011

Learning Objectives:

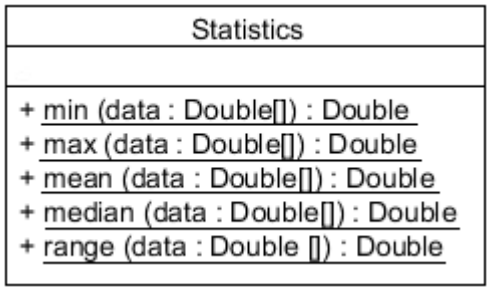
- Practicing the use of arrays (creating, initializing, iterating through, passing as arguments)
- Practice method calls (static, instance, own class, other classes, with and without parameter)
- Increase the understanding of the static keyword

Description:

Create a project called **A8_YourName** with two java files called **Statistics.java** and **StatisticsTest.java**

Statistics.java:

Implement the class as described in the UML class diagram below. All methods return a value. There should be no print statements in the Statistics class.



Statistics is yet another class that provides useful functionality that does not depend on any instance data That's why all the members in the Statistics class are static.

Ad min, max, mean, median, and range:

Min, max, mean, median, and range are 5 values that can be calculated based on a set of data.
Min and max have the familiar meaning and mean, median, and range are three values commonly used in statistics. Here is a link with a description and examples on how to calculate these three values:
http://www.purplemath.com/modules/meanmode.htm
All five methods take a double array as parameter. These are the data values that are used to calculate min, max, mean, median, and range.

Ad range:

You need to use your methods min and max in order to calculate range.

Ad mean:

In mean you divide the sum by the number of data values. Both the sum and the number of data values are whole numbers, yet you don't want to use integer division because that would result in the loss of the fraction part.
Convert one of the integers to a double. The moment one of the operands is a double the second operand will automatically be promoted to a double and double division will be used. The way to convert an integer to a double is by writing the type double in parenthesis in front of the variable. This is called casting. (check out Chapter 6.7 for more info)

```
e.g.:   double result = (double) number1 / number2;
```

StatisticsTest.java:

In order to test the methods from the Statistics class we need an array of doubles that contains the data.

- Create two data sets data1 and data2 using array initializer
  - data1 includes the values 13f, 18f, 13f, 14f, 13f, 16f, 14f, 21f, 13f
  - data1 includes the values 13.0, 17.5, 25.0, 20.4, 13.5, 10.4, 11.6, 10.2, 16.0, 23.0, 19.5, 14.0, 15.0, 24.2
- Calculate and display min, max, mean, median, and range of data1.
- Calculate and display min, max, mean, median, and range of data2.
- Clearly label the output . Display the dataset values before you list min, max, mean, median, and range (see sample output)

Do not create an instance of type Statistics. All methods should be called directly on the type (like in Math.pow(2,3))

Sample Output:

```
Data1: 13.0 18.0 13.0 14.0 13.0 16.0 14.0 21.0 13.0
Min: 13.0
Max: 21.0
Mean: 15.0
Median: 14.0
Range: 8.0

Data2: 13.0 17.5 25.0 20.4 13.5 10.4 11.6 10.2 16.0 23.0 19.5 14.0 15.0 24.2
Min: 10.2
Max: 25.0
Mean: 16.4
Median: 15.5
Range: 14.8
```

Max Points: 30 pts

There will be continued focus on good coding style - especially naming conventions and proper indentation. I will deduct up to 2 points for inproper indentation or variable names that are not camelCased.

Turning in:

Zip up your project and rename the file **A8_*YourName*.zip** . Turn it in via Virtual Campus.