Lesson 2 : CS 509 Design of Software Systems

Description: Your task is to complete OO Analysis for a small domain. This includes Use Cases and a UML class diagram. This is a paired assignment. You will be given a fully-realized solution on a similar problem that you can use to determine what you will need to accomplish. There will be a number of self-assessment questions on the sample solution that you can use to familiarize yourself with the technique you will be using for your own assignment.

Detailed Submission Requirements

You shall complete a set of Use Cases, following the standard format described in class and in the Object-Oriented Software Engineering textbook (available in the library).

You shall complete a single UML Class Diagram with all classes to support the use cases. The class diagram shall be composed of classes with defined methods and attributes. You must use appropriate UML marks for all methods and attributes.

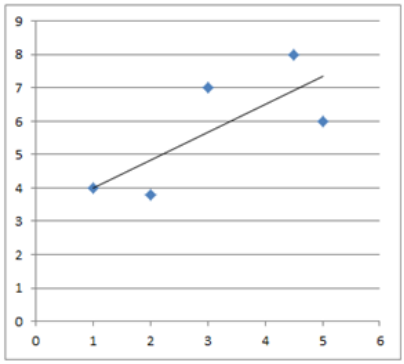
You shall produce images of the Forms that you reference in the Use Cases. These forms represent the interaction between the actor and the system.

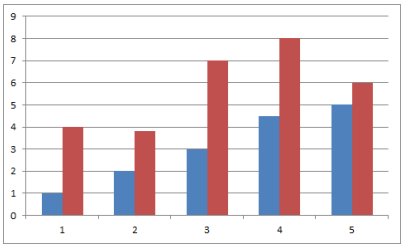
Problem Domain

You are working with a scientist who generates data that she would like to visualize using graphs. Given the data set, she wants to see the graph(s) on the right. Sometimes she wants a Cartesian plot, but at other times the data represents two series that are to be graphed in columns.

Sample Data Set:

x	y
1	4
2	3.8
3	7
4.5	8
5	6





Interactive Input Data

Sometimes she wants to interactively create a data set by entering in the (x,y) values one at a time. When doing so, she may make mistakes typing in the values, so she needs to be able to edit (or delete) any (x,y) values that are currently in the data set. No Data Set can have more than 2048 (x,y) values.

Saving Data Sets

The scientist wants to be able to store a given data set to a file for later access.

Stored Data Set in File

Sometimes the data is already stored in a file which is a comma-separated set of values. She wants to be able to load up a given data set as found in a file. ~~**Note: You may be aware that Java often restricts access to files but you can place the data sets within your ~/public_html directory on the CCC machines and a Java application can retrieve it**~~. If loading a Data Set with more than 2048 (x,y) values, all other values are ignored. The Scientist can request to load a data set from a file. The Scientist can also store a data set to a file. **Note: There no longer is any restriction on File Access**.

Output Formats

There are two kinds of output formats, Cartesian plots and column formats. She wants to be able to switch between these two formats easily. In the Cartesian plot, she sometimes also wants to compute and draw a trend line using Simple Linear Regression (http://en.wikipedia.org/wiki/Simple_linear_regression). When the Trend Line is computed, the equation represented by that Trend Line must be made visible to the scientist. The scientist also wants to be able to "hide" or "show" the horizontal background lines on both Cartesian and column charts. The scientist also wants to be able to "hide" or "show" the values shown on the X/Y Axes.

Forms to Develop

Based upon the lecture given on 9-24-2013 you should devise a set of appropriate GUI forms to govern the execution of this application. I do not want to pre-specify any layout or format, but rather want you to develop ones appropriate for the task at hand.

With your use cases you must submit sample "screen shots" (pencil drawings are fine) of what the GUI will look like.

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