

Pratik Gandhi, Mr. Tom Weiderman
 GK-12: AP Statistics at Gardner High School

Summary:

Students were learning about scatter plots and how to use calculator to plot scatter plot. They were going to cover correlation, regression line, and outlier topic in upcoming weeks. So Mr. Weiderman and I decided to introduce them with this MATLAB GUI. In this MATLAB demo, students had freedom to choose mean of X, mean of Y, std of X, std of Y and correlation coefficient. Once they input those parameters, they can see how the data points are distributed. So I asked students to play around with these parameters, and explain the results. They also had option to calculate the regression line based on the data provided, and compare it with the actual answer, which can be generated in MATLAB. Mr. Weiderman and I started explaining students about these different concepts.

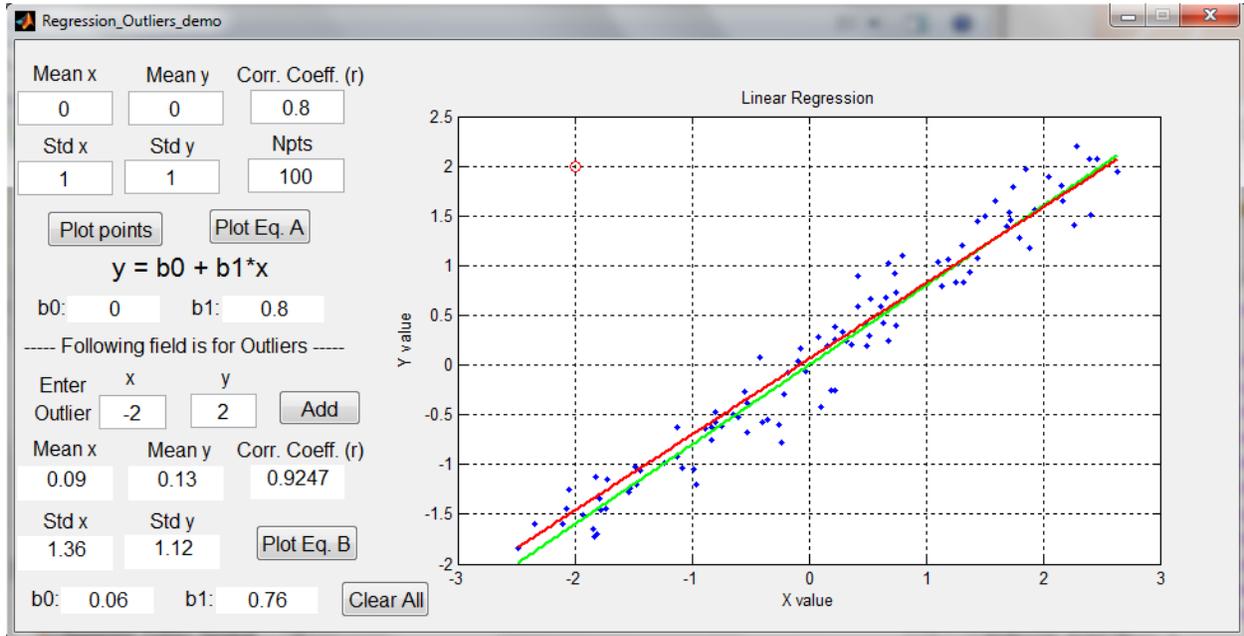
Period: **Class: Regression, Correlation and Outlier**

Date(s): October 18th, 2012

SETTING THE STAGE	
<u>Essential Question</u>	What makes millions of people around the world to talk to each other on cell phones
<u>Content Objective(s)</u> (Student-friendly)	We should be able to understand correlation between two set of values.
<u>Connection to previous or future lessons</u>	Can lead to residual.
<u>Critical Thinking Questions</u>	What is correlation? How can it be used to find the relationship between two variables? How does an outlier change regression line?
<u>Key Vocabulary</u>	Correlation, linear regression, residual, outliers
<u>Materials Needed/Safety</u>	Computers, MATLAB

ACTIVE INSTRUCTION	
<ul style="list-style-type: none"> • Launch (Engage) 	Discuss about finding the correlation between two variables. Let them play around with the MATLAB GUI demo, Regression_Outliers_demo.m, and let them predict how to graph looks like based of correlation coefficient as well as let them calculate the linear regression line and compare that with the actual one.
<ul style="list-style-type: none"> • Investigation (Explore) 	<p>How are the correlation and linear regression line used?</p> <p>How to find the linear regression line from the correlation coefficients, means and variances?</p> <p>How does an outlier change the correlation and regression line?</p>
TIME FOR REFLECTION	
<ul style="list-style-type: none"> • Summarization (Explain & Extend) 	Summarize them all the definition related to the correlation such as linear regression, residual. Also let them understand the use of software like MATLAB.
<ul style="list-style-type: none"> • Assessment (Evaluate) 	Ask them to write or discuss about what they learned about correlation. And how it is used in real life applications such as radio communication.
<ul style="list-style-type: none"> • Homework 	None.

(1) Positive Correlation with an Outlier



(2) Negative Correlation with an Outlier

