**Customer Satisfaction**

**Customer Value Analyst – Jennifer Tripoli**

**Description**:

You want to purchase stock in a fast food company. You are researching the statistics of several companies to help you decide which would be the most profitable for you to purchase stock. The American Customer Satisfaction Index (ACSI) reports customer satisfaction scores on scale of 0 to 100 at the national level. You will compare these reports to predict future satisfaction in the upcoming years, and use these predictions to purchase upcoming stocks.

For more information on ACSI, please reference the following website: <http://www.theacsi.org/index.php?option=com_content&view=article&id=49&Itemid=111>

**Mathematical Standards:**

* (S – ID.6) Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data.

c. Fit a linear function for a scatter plot that suggests a

linear association.

* (S – ID.7) Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
* (S – ID.8) Compute (using technology) and interpret the correlation coefficient of a linear fit.

**Materials**:

Fathom, Food Data.csv (Food Data.csv is data that has been adapted from the ACSI website for the purpose of this activity.)

**Before you begin**:

Considering the companies listed below, which company do you feel would be the best choice to invest in? Justify your reasoning.

Companies:

Little Caesar’s Dominos McDonald’s

Taco Bell Pizza Hut Wendy’s Kentucky Fried Chicken Burger King

**Setting Fathom up**:

1. Open Fathom
2. File > Import > Import From File… and choose the Food Data.csv file

**Analyze and Interpret the Data**:

1. With the collection highlighted, drag a table so that you can view your data.
2. Create a year vs. satisfaction rate graph for each restaurant. You should have eight graphs total.
3. Create a moveable line for each graph showing what you believe the trend of the data is. To do this, highlight the graph then click Graph > Add Moveable Line and adjust the moveable line to fit the data. You need to create a moveable line for each graph.
   1. Using your placement of the moveable line, in which restaurant would you invest? Why?
   2. Which restaurant would you not consider? Why?
4. Looking at the graphs, adjust the scales so that your dependent axis is from 0 to 100. To do this, double click on the graph and change the “yLower” to zero and “yUpper” to 100. You must do this on each graph. Since you have normalized the graphs, would you change your investments that you stated in 3a and 3b? Explain.
5. Now, create a Least-Squares Line for each graph. To do this, highlight the graph then click Graph > Least-Squares Line.
   1. How does the actual Least-Squares Line compare to your interpretation of the data using the moveable line?
   2. Based on the Least-Squares Line, in which restaurant would you invest? Which would you not consider? Why?
6. Based on the company you choose to invest in, what would the customer satisfaction index rating be for 2015? 2107? How did you determine these ratings? Are these estimates reasonable? Justify your reasoning in the context of the problem.

**Final Thoughts and Questions**:

Create a final analysis of your findings. You can create this document by hand or in Apple Works. Your write up should include your hypothesis, conclusions from the Moveable Line analysis, conclusions from the Least-Squares Line analysis, and a reflection on the total process.

**Extension Project:**

Now that you have been through the process, pick an additional data set to analyze from the ones listed below. What conjectures can you make in the context of the data that you have chosen? Type up your analysis of your chosen data set using screen shots to support your conclusions. Your analysis should be similar to the procedures we modeled in class.

Airline Data.csv Car Data.csv

Department Stores Data.csv Hotel Data.csv

**Teacher Guiding Questions throughout the Experiment:**

* Which restaurant is the most reliable?
* Which restaurant is growing the fastest?
* Interpret the y-intercept in the context of the restaurants.
* Interpret the slope in the context of the restaurants.