Name(s) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**BA 355: ICE 2 – Curve Fitting**

Use the data provided online to answer the following questions.

|  |  |  |
| --- | --- | --- |
| Minimizing | slope = a | y-int = b |
| Σ e^2 |  |  |
| Σ |e| |  |  |
| Σ |e%| |  |  |
| Σ e^3 |  |  |
| Σ √e |  |  |

**1)** Fit a line to the data on the Problem 1 sheet. Easy, right? Not so fast… Instead of using Excel’s prebuilt fitting tool, do it the hard way: The line will be y = ax + b and you need to find a and b. Pick two cells for these coefficients. Build columns with the absolute errors and the squared errors. Use Solver to minimize the sum of the squared errors to find a, the slope and b, the y-intercept. (These should be the same as what Excel automatically generates if you’d like to check your answers). Now, also solve for a and b by minimizing the sum of the absolute errors (MAD), the sum of the mean absolute percentage errors (MAPE), the sum of the cubed errors and the sum of the square root of the errors (why not?). Report all coefficients to two decimal places.

How similar/different are the coefficients for the different minimizations?

Think of some other way to fit the line by minimizing something else. What did you choose? What are your coefficients now?

**2)** In inventory control, the inventory cost (IC) often follows a function like IC = a/Q +b\*Q + c where Q is the order quantity. Fit this function to the data on the Problem 1 sheet by minimizing the sum of the mean absolute percentage errors. What are the best values of a, b and c? Graph the data points on a scatter plot and draw the curve using the best values of a, b and c to show how well it fits (or doesn’t fit) the data.

**3) Extra Credit:** After you’ve completed the two problems above, fit the Gamma distribution and Lognormal distribution to the data points on the XC sheet. Ask me for details.