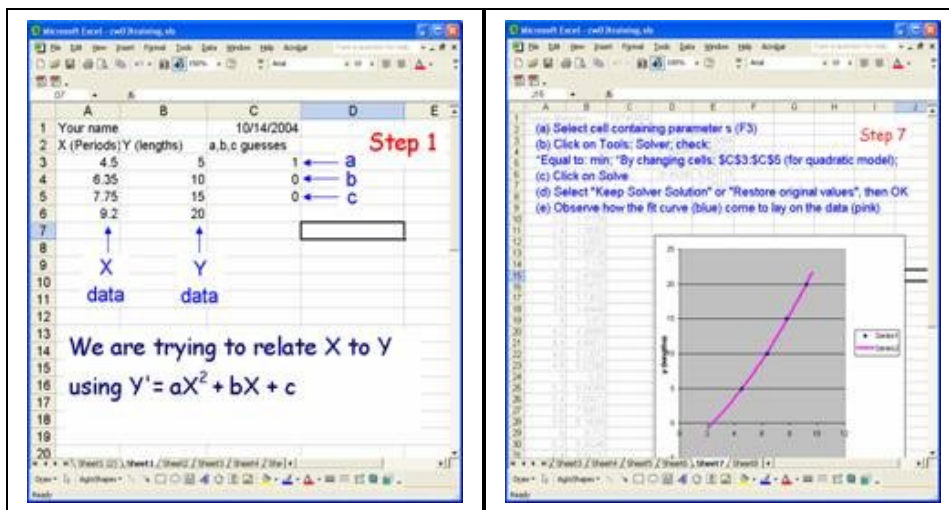


Engin 103
Fall '06
Meeting #9: October 2, 2006

Starting from a set of data X and Y, we tried a quadratic model relating X to Y, which involved 3 parameters (or coefficients of the quadratic polynomial) a,b, c. From initial guesses of a=1; b=0; c=0, “Solver” tried different values for a,b,c each time obtaining a different s parameter, when the s parameter (which is an indicator of how close the model to describe the data set) would not go any lower, it outputs final values for a,b,c (step 7). The values determine the best quadratic model, and the curve fits well on to the four data points we started with in step 1. Steps 1 and 7 are shown below. Complete steps were shown in the last class notes.



Today we did CW4 and started CW5. In CW4 we tried the linear model by setting $a=0$ (a was the coefficient of the quadratic term, in our spreadsheet it is located in cell \$C\$3). Then we found the best linear model by doing a similar process in Excel as how we found the best quadratic model. The only change was within the Solver dialog window, \$C\$3 should not be one of the parameters for Solver to change in order to minimize the s parameter contained in \$F\$3.

We also tried the cubic model: $d \cdot x^3 + a \cdot x^2 + b \cdot x + c$, which requires an additional cubic term with an additional parameter d . Changes are: 1) Adding a guess of 1 for d in C7$; 2) Modify the formula in $D3$; 3) _____; 4) Modify the formula in $B9$; 5) Copy this formula onto $B10-B47$; 6) Execute Solver, with this change

We started CW5 by importing data from the link in CW5 as follows: 1) Select both columns of data; 2) paste into column A of new spreadsheet; 3) Under “Data”, select “Text to columns”; within the Text to columns dialog window select “Fixed width”, then move line cursor to correctly separate both columns; then hit “Finish”; 4) Swap column A and B by inserting a new column A, then cut column C and paste into new column A. Now column A is X=metal distance; and column B is Y=Ultrasonic response.

Suggested items to write in the Engin 103 logbook:

- 1) Write in your own words the summary for finding the best linear and cubic model above, note that there are two blank spaces you need to fill in.**
- 2) Describe in your own words what could be the application of the method we are doing in these CW3-5, in addition for doing Project 1**

Items due next class:

-Logbook

-Data sets for Project 1 which is due next Tuesday 10/10