Teach 1 - Least Squares Fit

Purpose

This exercise is designed to provide you with some experience in working with least squares approximation of data. The technique is designed to filter noise associated with data, working with the underlying assumption that there is a linear relationship describing the variation in the (x, y) data stored in the file `teach1.dat`. The data is assumed to have a linear fit, as it represents the average cost of diesel fuel (dollars/gallon) as a function of the price of crude in (dollars/barrel) as determined by market conditions averaged over the period from 1950 to 2009 based on samples taken randomly each month.

Problem solving approach

You are free to use any software product to find the best least squares line fit to the data set provided in `/home/kolibal/cos702/assign/teach1/teach1.dat`. This includes writing your own software, or using a package such as `octave`, `maple`, or `matlab`.

Assignment

The data analysis must be accompanied by a comprehensive write up of: 1) the methodology (i.e., a discussion of the underlying theory associated with least squares method, 2) a discussion of the implementation, i.e., the particulars of the software used, and the results. This should include a graph of the data showing the best fit, and a characterization of the errors. The write up is to be done using LaTeXand should be presented as though it were a short paper or technical note, maintaining high standards for quality in technical writing.

You should carefully note any difficulties encountered, along with an assessment of the viability of the approach, including such issues, for example, as scalability, and believability of the results.

The resulting PDF file should have a title, along with the names of the authors, and this should be submitted by email to Joseph.Kolibal@usm.edu with the subject heading, 'COS702 TEACH1', exactly as written.