10.34. Numerical Methods Applied to Chemical Engineering
Fall 2005. Homework # 9
Due : Friday, December 9, 2005. 9am

For brevity, this homework focuses on problems involving fitting a model to a single set of data in Table 8.4, containing heat-transfer data for a packed bed of solid pellets. We fit a nonlinear model for the Nusselt number as a function of the Reynolds' and Prandtl numbers, and consider a transformed version of the model in which the dependence upon the parameters is linear.

Problem 1. In 8.A.1 you are asked to compute the least-squares estimates of the parameters and their confidence intervals by hand using the formulae in the text.

Problem 2. In 8.A.2, you are asked to redo the calculation using the built-in **regress** routine of the MATLAB statistics toolkit.

Problem 3. In 8.A.3, you are asked to fit the original nonlinear model without the transformation using **nlinfit**.

For each problem k = 1, 2, 3, supply your code as the MATLAB program *username_P8Ak.m*.