V63.0252 Numerical Analysis Spring 2007
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Course home page URL: http://www.math.nyu.edu/courses/spring07/V63.0252-001/index.html
Office hours: Mondays 3:30–4:30pm and Thursdays 4:00–5:00pm.
Homework set 3: Due Monday March 5, at midnight.

No homework will be accepted after that time.

Homework should be given to me in class or put under my office door. Do not put it in my mail box. For general rules, read my home page.

Four MATLAB primers are now available via the course homepage. Xiaoyu Wang (xiaoyu@cims.nyu.edu) can also assist you in learning the basics.

1. Write a MATLAB program which provides a $PA = LU$ factorization of any nonsingular matrix A. An outline of such an algorithm, given in psuedo-MATLAB, is provided by the second algorithm in a recent hand-out. However, you should rework the algorithm so that you only use one rather than two loops.

2. Formulate and solve the least squares problem used by Gauss in his 1850 lectures. Use MATLAB and the simplest possible script. Compute the least squares as well as the maximum error of the solution.

   The data is as follows:
   $Q = P + 64.334$
   $R = P + 349.366$
   $R = Q + 283.596$
   $S = Q + 206.580$
   $S = R - 76.108$
   $T = R + 648.427$
   $T = S + 719.612$

   S, T, Q, R, and P represent the elevation of five towns in Northern Germany. The solution represents the difference in elevation of the towns; you cannot compute the actual elevation with respect to sea level from the data given.

3. Problem 2.1 in the text book.
4. Problem 2.8 in the text book.
5. Problem 2.9 in the text book.
6. Problem 2.10 in the text book.