Math 308, Spring 1999

Assignment 5.

Given Friday, May 7; textbook exercises due **Wed., May 12**, MATAB problem due Friday, May 14.

Objectives: To learn about least squares problems and the correspondence between matrices and linear transformations.

Exercises from the text:

p. 175, #21, 22.

p. 190–193, #1, 16, 17, 18, 21.

p. 205, #1, 7.

p. 216, #2.

MATLAB exercise:

Following is the census data used in assignment 1:

year since 1900	population in millions
0	76.0
20	105.7
40	131.7
60	179.3
80	226.5

Set up and solve least squares problems to find the best fit to this data by: (a) a straight line; (b) a quadratic polynomial; (c) a cubic polynomial; and (d) a fourth degree polynomial. You may use the MATLAB least squares solver `A\b`. Also compute the residual norm `norm(b-A*x)` for each of the least squares problems.

Hand in: Plots showing the data points and each of the least squares fits. On each plot, print the value of the corresponding residual norm.