Homework #7
Due Date: Mar. 26, 2002

1. [30] Lim, Problems 9.14

2. [10] Lim, Problem 9.21, parts a & b.

3. [90] Deblurring. Download the image of the house, hw7image.mat, from the course web site. We will apply a blur to this image and then look at different ways to de-blur it.
    a. Blur the image using `conv2` and the following blur function
        `b = ones([7 7])/49;` and display result using `imagesc` and determine the MSE relative to the unblurred image..
    b. Create an inverse filter, $H1$, that is the inverse filter of b. Apply to the blurred image and display and determine the MSE relative to the unblurred image.
    c. Create an inverse filter, $H2$, that is clipped at a level of $g = 5$. Apply to the blurred image and display result and determine the MSE relative to the unblurred image.
    d. Create the iterative inverse filter, $H3$. Suppose we set the value of $l = 0.5$. Is the iterative approach stable for this value of l. Apply to the blurred image for number of iterations $k = 2$, 10, and 20. Display results and determine the MSE's relative to the unblurred image.
    e. Add Gaussian noise to the image with variance $= 4$. Repeat steps a) through d).
    f. Comment (briefly) on the relative advantages and disadvantages of the above approaches.