**EE432 Fall 08 Homework Problem Set 4 (PS04) Due: Wed, 9/17/08**

1. Download the ps04.wav file from the course website (see the Homework link). It is sampled at 8000 samples/sec. How can you take that data, and resample it at 16000 samples/sec without re-recording it? Use the `interp1` function to do so. Use "linear" interpolation and also "spline". The interpolated signal should last about 1 sec, which is the duration of the original.

   Use `wavplay` to listen to the interpolated waveform, but make sure that since you've changed the sample frequency to 16000, you need to specify that in the `wavplay` command.

   Use the `hold on` command to plot the original samples, the linear interpolated samples in red diamonds only (i.e., no connecting line), and the spline interpolated samples in black circles only. Set the x-axis limits to fall from time $t = 0.45$ sec and $t = 0.452$ sec, and the y-axis limits to be -1 and +1. Turn in this plot properly labeled. Can you say anything about the accuracy of the two methods of interpolation?

2. Etter/Ives notes/text, problem 2-1 (note: it uses Figure 2.42, which is a little out of place in the copy of the notes I gave you—I believe it is on the last page of the notes). Don't forget that sampling requires a sample frequency > 2 times the highest frequency content of the analog signal.

3. Etter/Ives notes/text, problem 2-2 (note: it uses Figure 2.43, which is a little out of place in the copy of the notes I gave you—I believe it is on the last page of the notes. Note the typo in this problem statement…the figure is of "two sinusoids with different frequencies," vice "two frequencies with different frequencies."