Whenever you make a plot, be sure to label both axes to tell exactly what the units mean.

Project #1

A sound signal corrupted by noise is saved in the file, 'noisysound.mat'. The sample size of the signal is 8001. The sampling frequency is 4000 Hz. Load the signal and plot it. Using a correlation function, find the frequency of the sound signal. The frequency of the sound is known as an integer between 430 to 450 Hz.

Hint) load('noisysound.mat');   % load data

Project #2

Calculate the discrete Fourier Transform of the sound signal in #1. Draw the amplitude spectrum. Then, find the peak frequency, which is the frequency of the original sound.

Hint function) max();   fft();

Project #3

A function given by

$$x(t) = e^{-t/4} \sin\left(\frac{2\pi t}{5}\right); \quad t \geq 0$$

Is sampled once per second from t=0 through t=16 seconds. In the upper of two subplots, make a discrete plot of x, the sample vector. In the lower subplot, make a discrete plot of the resampled version of x, with three samples between each pair of original samples. Use the resampling method in (3.27).