1. Load the data chip using the load chirp command. It is a 13129 element vector. It is actually a recording of chirping of birds, sampled at 8192 samples per second. Plot this vector such that you have time on the x-axis and amplitude on the y axis.
2. Make a 6^{th} order low pass filter using fir1 command with cut off frequency 0.4.Write the values of the filter coefficients in your notebook.
3. Make a 8^{th} order low pass filter using fir1 command with cut off frequency 0.4. Write the values of the filter coefficients in your notebook.
4. Plot the frequency response using freqz command for the output of the above two filters and show how the higher order filter is giving a better response.
5. Make a 10^{th} order bandpass filter using fir1 command with w1=0.3 and w2 = 0.6. Write the values of the filter coefficients in your notebook and plot the frequency response.
6. Make a 14^{th} order band reject filter using the command fir2 which has a magnitude response of 10 times in the pass band. The frequencies to be rejected are in the range w1 0.4 and w2 = 0.6.
7. Make a polynomial 'b' which has the roots [-0.2- 0.3i 0.7+0. 7i], and make another polynomial 'a' which has the roots [0.3 -0.4i -0.5 +0. 6i]. Now, make a filter which is the division of these polynomials i. e. $\frac{b(x)}{a(x)}$. Using fvtool, plot the pole –zero plot this filter and show the location of poles and zeros.
8. Make a 5^{th} order butterworth filter(lowpass) with cutoff frequency 0.5. Using fvtool plot the pole-zero plot of the above filter and show the location of poles and zeros.