Homework 1 – Audio Processing

Due – Tuesday, January 31 2012, 11:59pm

The goal of this problem is to get you familiarized with a few basic audio processing techniques. There are two parts to this problem

(i) **Noise Filtering** – You are given a noisy signal (a single tone in this case) in the file "noisy.wav". The frequency of the tone is not given to you. You may use MATLAB to determine this. You are required to design a suitable Band Pass filter that filters out the noise. You may do this using the filter builder tool (type 'fdatool' in MATLAB command prompt) in MATLAB DSP toolbox. You need to use this filter to filter out the noise from the tone provided to you. This part has to be implemented in C. You may need to convert the tone (in ".wav" format) to ".dat" format. You need to record your filter response in "filterResponse.dat" and convert it back to wav format. Conversion between ".wav" and ".dat" can be done by using Sox convertor (http://sox.sourceforge.net/)

(ii) **Amplitude Modulation** – After performing the filtering operation, you need to perform amplitude modulation on the filtered signal. You may choose a suitable frequency of your choice to modulate the signal. Keep in mind that aliasing will occur if the frequency is not chosen suitably. You need to print the amplitude modulated signal into "AM.dat" and test it by playing it.

Hints: You may wish to analyse the ".dat" file before you begin writing your C code.

Submission instructions will posted on the blackboard in a few days.