DSP Lab

Week 1

The signal ‘SignalHW2.wav’ is given.

a) Import the signal to MATLAB and plot it.

Hint:

[x,Fs] = audioread('SignalHW2.wav')

sound(x,Fs)

b) Approximate the signal for the time slot of 0-1 sec using Fourier Series Expansion (come up with a good approximation, show the mathematical representation of your model, and plot it on the same figure as the original signal. Use appropriate legends). Here is a good link showing how to use MATLAB for this question.

https://www.mathworks.com/help/curvefit/fourier.html

c) Finally, sketch the spectrum of the approximated signal for the time slot of 0-2 (call it 'y'). Here is how you can do it.

Len_y = length(y); p = abs(fft(y)); f = (Fs/Len_y)*(1:Len_y);figure; plot(f,p);

title('FFT of Signal'); ylabel('|Y(jw)|'); xlabel('f(Hz)'); grid;