% EnginHears Version 2.0

%{

I'm calling this version 2.0 even though there was no official version

1.0. I'm treating the algorithm that changed the frequency spectru in

a specific band as version 1.0. Version 2.0 uses the ski-slope filter

that we found online in hearingAidF.m. If a nother significant change

to the algorithm occurs, we'll call that Version 3.0 and so on. Version

2.0 also includes other functions: createPowerSpectrum, viewAudio, and

controlVolume.

%}

%% x = original audio signal

%% Fs = sample rate in Hertz

%% L = number of samples

%% X = the fft of x

%% transitionV = a vector of 4 frequencies used for the calcualtion of the ski-slope filter in freqshape

%% gain = input gainused for the max value in freqshape

%% Xleft\_editted = is a variable used to make the application of the filter easier

%% Xright\_editted = is a variable used to make the application of the filter easier

%% y = the ifft of the X after the filter is applied

clear; close all;

%% Read and Play Audio File

[x, Fs] = audioread('Conversation-Moderate.mp3');

player = audioplayer( controlVolume(x,1), Fs);

play(player)

pause(50)

%% Take the FFT of the input signal x

X = fft(x);

%% From MATLAB: create Power Spectrum

createPowerSpectrum(X, Fs, ' X')

%% Calculate and Apply Ski-Slope Filter

transitionV = [1000, 1500, 2550, 5000];

g = 50;

[~, gain] = freqshape(x, g, transitionV, Fs); % freqshape claims to adjust

% the signal for you, but the output is not changed noticeably, so I have

%elected to apply the filter manually

Xleft\_editted = X(:,1).\*gain;

Xright\_editted = X(:,2).\*gain;

X\_editted = cat(2,Xleft\_editted,Xright\_editted);

%% take the ifft of the editted X signal

y = ifft(X\_editted,'symmetric');

%%write to mps file

audiowrite('Conversation\_Moderate\_Filtered\_50.wav', y, Fs);

%% create audio players for the signals

%play player2 for new sample

player2 = audioplayer(controlVolume(y, 1), Fs);

play(player2)

%%

viewAudio(x,Fs,' Conversation')

viewAudio(y,Fs,' Editted Conversation')