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%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% ECEn 380 | Lab 4
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% Record a 5 second clip at 96kHz, 24-bit, mono
recObj = audiorecorder(96000, 24, 1);
disp('Start speaking.')
recordingblocking(recObj, 5); % Record/Sample for 5 seconds
disp('End of Recording.')

myRecording = getaudiodata(recObj);
whos myRecording

figure(1);
plot(myRecording);
title('Plot of Audio Recording');
xlabel('Time(seconds)');

%96,000 sample/s
player = audioplayer(myRecording, 96000);
playblocking(player);

%70,000 sample/s
player = audioplayer(myRecording, 70000);
playblocking(player);

%120,000 sample/s
player = audioplayer(myRecording, 120000);
playblocking(player);

% 2 second impulse response with echo
impulse_echo = zeros(192000, 1);

% Adding delta functions
impulse_echo(1) = 1; %delta at the beginning
impulse_echo(48000) = 0.5; %half amplitude delta .5 seconds later
impulse_echo(96000) = 0.25;
player = audioplayer(impulse_echo, 96000);
playblocking(player);

% Convolving Together
myRecording_echo = conv(myRecording, impulse_echo);
player = audioplayer(myRecording_echo, 96000);
playblocking(player);

% Trying the 3 other Acoustic Responses
impulse_great_hall = wavread('great_hall.wav');
impulse_octagon = wavread('octagon.wav');
impulse_classroom = wavread('classroom.wav');

player = audioplayer(impulse_great_hall, 96000);
playblocking(player);
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player = audioplayer(impulse_octagon, 96000);  
playblocking(player);  
  
player = audioplayer(impulse_classroom, 96000);  
playblocking(player);  
  
figure(2);  
subplot(3,1,1);  
plot(impulse_great_hall);  
title('Great Hall Acoustic Response');  
xlabel('Time(seconds)');  
subplot(3,1,2);  
plot(impulse_octagon);  
title('Octagon Acoustic Response');  
xlabel('Time(seconds)');  
subplot(3,1,3);  
plot(impulse_classroom);  
title('Classroom Acoustic Response');  
xlabel('Time(seconds)');
```