EE 274 Digital Signal Processing 1 Lab Activity 1

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D. Aliasing

The following exercise investigates the effect of improper sampling.

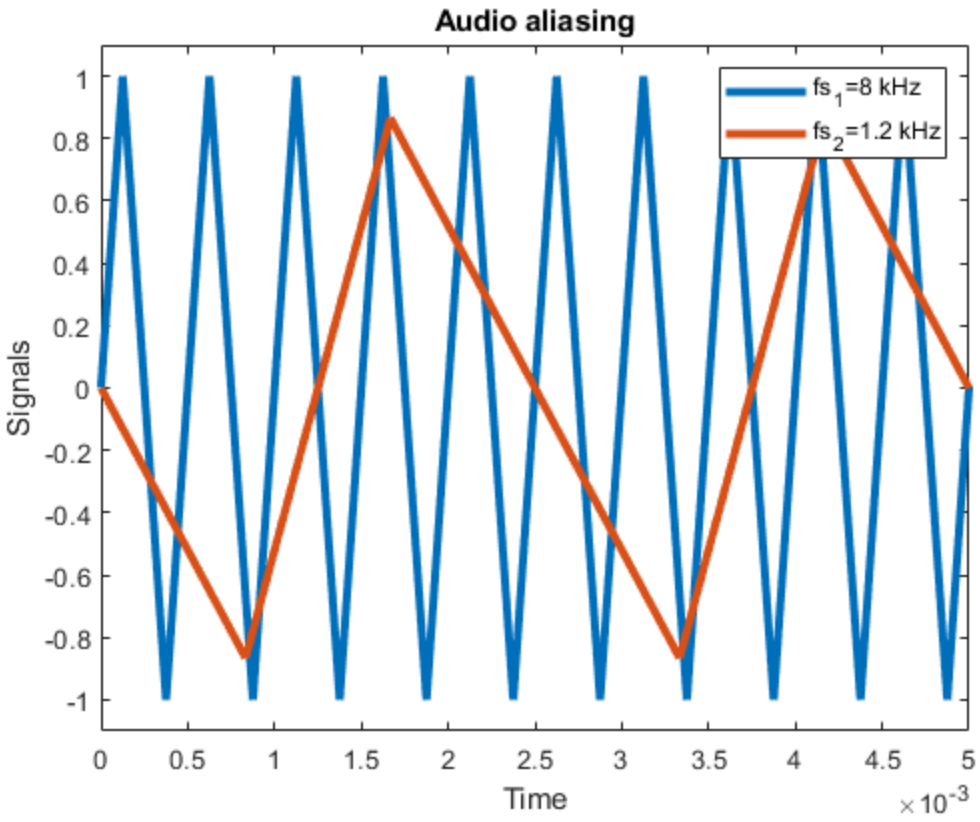
1. Generate two 1 kHz sine signals (2 seconds duration), first signal at 8 kHz sample frequency and second signal at 1.2 kHz sample frequency

2. On the same graph, use the plot function to display the two signals versus t in the range $0 \leq t \leq 5$ msec.

3. Listen to the two signals one after another using the function **soundsc (x, fs)**;

4. Compare the two signals. How does the sampling rate affect the digitized sound?

```
T = 2; %parameters
f0 = 2000; % 1kHz sine signal
fs1 = 8000; % Sampling frequencies
fs2 = 1200;
[x1, t1] = sin_NU(fs1,f0,T); % sine signal sampled at fs1
[x2, t2] = sin_NU(fs2,f0,T); % sine signal sampled at fs2
figure;
plot(t1,x1,t2,x2,'LineWidth',3.0),
axis([0, 0.005, -1.1, 1.1])
legend('fs_1=8 kHz','fs_2=1.2 kHz')
xlabel('Time')
ylabel('Signals')
title('Audio aliasing');
```




```
soundsc(x1,fs1)

soundsc(x2,fs2)
```

```
function [x, t] = sin_NU(fs, f0, T) %function to generate sine signal
t = 0:1/fs:T; %the signal vector output
x = sin(2*pi*f0*t); %the time vector output
end
```

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