

Tune-Up Tuesday #8 for October 31, 2017

(a) Use IIR filter with the pole-zero diagram defined by MATLAB code posted on Canvas site

(b) Lowpass, highpass, bandpass, bandstop or allpass filter? Use `freqz(C*numer, denom);`

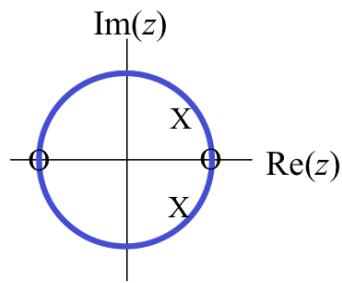
(c) Run code on slide 4-5 to play a C major scale

(d) Run code on slide 4-7 to plot its spectrogram

(e) Filter the C major scale in MATLAB variable `vec`

(f) Play the filtered C major scale. What changed?

(g) Plot the spectrogram of the filtered C major scale. What changed?



```
% zeros on unit circle
z0 = -1;          % angle pi
z1 = 1;          % angle 0
numer = [1 -(z0+z1) z0*z1];
% poles inside unit circle
f0 = 440; fs = 8000;
w0hat = 2*pi*f0/fs;
r = 0.99;
p0 = r * exp(j*w0hat);
p1 = r * exp(-j*w0hat);
denom = [1 -(p0+p1) p0*p1];
% Set magnitude response
% at pole angle to be 1
z = exp(j*w0hat);
zvec = [z^2 z 1];
C = abs((denom*zvec') / (numer*zvec'));
freqz(C*numer, denom);
```