Tune-Up Tuesday for September 4, 2018

(a) Copy, paste and run the Matlab code from slide 1-14 to generate a cosine signal at frequency 440 Hz to play it as an audio signal at a sampling rate of 8000 Hz:

```
f0 = 440;
fs = 8000;          % rate
Ts = 1/fs;
t = 0 : Ts : 3;     % 3 sec
x = cos(2*pi*f0*t);
sound(x, fs);
```

(b) Modify the code in (a) to change the cosine frequency to 880 Hz and run the code. Any difference in what you hear vs. a cosine frequency of 440 Hz?

(c) Add to the code in (b) to plot the signal in the time domain using the **plot** command.

(d) Copy and paste your code for (c) into the Tune-up Tuesday #1 page on Canvas.

Answer:

```
f0 = 880;              % change from 440 Hz (A) to 880 Hz
fs = 8000;             % sampling rate in samples/s
Ts = 1/fs;             % sampling time in s
t = 0 : Ts : 3;        % 3 seconds in duration
x = cos(2*pi*f0*t);
sound(x, fs);
plot(t, x);

% (b) Changing f0 from 440 Hz to 880 Hz creates a sinusoidal tone
%     at 880 Hz that sounds like a higher frequency tone ("pitch")
%     the cosine at 440 Hz.
%
% (c) An additional comment could have been that the plot(t, x)
%     command is trying to plot 24000 points on one plot, which
%     results in a blue square/rectangle.  Reducing the number
%     of points, e.g. plot(t(1:100), x(1:100)), would have shown
%     a sinusoidal waveform.
```