**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.**