**Computing Assignment 2**

(Anyone can be a musician☺)

1. Synthesize a sinusoid of given frequency (F0 in Hz) in the range (100 Hz – 400 Hz).
2. Now modify your sinusoid to a more interesting waveform with the same fundamental frequency (F0) but different waveshape by adding in more harmonics of various amplitudes and phases.

These “spectral” modifications will change the “timbre” (acoustic quality) of the sound and can potentially make it sound like a note played on a musical instrument. Try to experiment with different timbres and plot the corresponding waveforms and magnitude spectra. Does adding more harmonics make the sound richer? You can also shape the temporal envelope of the tone.

1. Next, use the music synthesizer you just built to play the given songs in a timbre of your design. Do you recognize these songs*???*

Song notes in sequence: (**F0** Hz, **Duration** ms)

Song A:

(185,200) (196,200) (220,400) (220,400) (247,400) (247,400) (220,600) (196, 200) (185, 400);

(185,200) (196,200) (220,400) (220,400) (247,400) (247,400) (220,600) (196, 200) (185, 400);

(185,200) (196,200) (220,400) (220,400) (247,400) (277,400) (294,800);

(294,400) (330,400) (277,400) (277,400) (247,400) (277,200) (247,400) (220,800)

Song B:

(262,200), (294,200), (294,200), (330,1000), (294,200), (262,200), (294,400), (392,800), (349.23,200), (330,200), (262,800), (220, 800), (196, 1200);

(262,200), (294,200), (294,200), (330,1000), (294,200), (262,200), (294,400), (392,800), (330,200), (392,200), (440,800), (392,800), (294,1600);

(262,600), (262, 200), (262,400), (262,400), (247, 400), (262, 800), (262,400), (247,400), (262,800), (294,400), (330,800), (294,800), (262,600), (262, 200), (262,400), (262,400), (247, 400), (262, 800), (262,400), (196,3200);

(262,600), (262, 200), (262,400), (262,400), (247, 400), (262, 800), (262,400), (247,400), (262,800), (294,400), (330,800), (294,800), (262,600), (262, 200), (262,400), (262,400), (247, 400), (262, 800), (262,400), (196,3200);

(262,1600), (294,1200), (196,400), (392,800), (349.23,400), (330,400), (294,800), (330,400), (349.23,400), (330,1200), (294,200), (262,200), (247,400), (262,800), (247,400), (220,1600), (196,1600);

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