EC 415 Software Radios
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Lab 1

1) The sine wave and cosine wave sound the same at the same frequency. This is as expected because a cosine wave is just a shifted sine wave.
2) $signal = .99V * [(sin(2\square * 392 * t) + sin(2\square * 262 * t)) / 500mV]$
   There are two different notes in this tone.
3) $signal = .99V * [(cos(2\square * 392 * t) * cos(2\square * 262 * t)) / 500mV]$
   $signal = 1.98V * [e^{j784\square t} + e^{-j784\square t}]/2 * [e^{j524\square t} + e^{-j524\square t}]/2$, this simplifies to
   $signal = .99V * [(cos(2\square * 654 * t) + cos(2\square * 130 * t))]$
   Two different notes are produced, one at a higher frequency (the sum of both frequencies) and one at a lower frequency (the absolute value of the difference between both frequencies).
4) By looking at the three largest peaks on the given FFT flowgraph, Octave 4
5) By looking at the three largest peaks on the given FFT flowgraph, notes A, F, and C
6) Flow graph file is submitted as well.