**CSC 338 Parallel and Distributed Computing**

**Exercise No. 1, January 24, 2018**

**Python Review**

**Goal**

Learn to use the ThinkDSP modules

**Background**

Chapter 1 discusses signals, waves, and spectra and the way they are implemented in the author’s thinkdsp module.

**Procedure**

1. Create a sine signal and a cosine signal, both with the same frequency, amplitude 1.0, and offset 0 radians. You’ll have to import thinkdsp (and matplotlib.pyplot or thinkplot for later steps). I suggest you create a function for steps 1 through 3 and a separate function for step 4.

2. Plot 5 periods of the two signals. You’ll have to create a wave from each one; use a duration of 1 second, a frame rate of 8000, and start each wave at 0. Create segments 5 periods long for plotting and plot them.

3. Experiment with the offsets of the signals. Change the offset of the sine signal to π/2. Go through steps 1 and 2 again with the new offset for the sine signal. What is the difference between a cosine signal with offset 0 and a sine signal with offset π/2? What does a sine signal with an offset of π look like? What if you change the offset to 2 π?

4. Create three new sine signals – 261.63 Hz, 329.63, and 392.0 Hz; use an amplitude of 0.5 and an offset of 0 radians for all of them. Add the three signals together to create a mix (a SumSignal). Create a wave from the mix, using a duration of 3 seconds, a frame rate of 8000, and a starting point of 0. Save the mixed wave and listen to it. When you save the mixed wave you might see a warning about normalizing the wave. Can you figure out how to modify your code to avoid that warning?

5. Do the exercises at the end of Chapter 1; you can use the chapter 1 notebook as a starting point.

6. Save your code from step 4 and your completed chapter 1 notebook in a folder titled Chapter1 in your upload folder on trace.