Lab 04

To submit your code:

Create a ‘lab04’ branch on your github repo. When you have code ready to submit, push to github, and create a pull request, making me a reviewer. We can then discuss your code via code reviews in a fashion you should be familiar with.

Undergrads:

Convolution in time

https://mathworld.wolfram.com/Convolution.html

Fill in lab04u.py with code to implement a convolution in time, plotting the signals in two subplots.

The first should just plot the two signals against each other as a reference.

The second subplot should refresh every iteration of the convolution, plotting both input arrays and the output array.

It should look relatively like the animated gif in the wolfram page, apart from the shading of the active areas that are part of the summation (bonus points if you can do that).

Your output should match the reference output from the scipy signal library. Perhaps this warrants another plot of the difference of your output compared to the reference.

Graduates:

Frequency domain filtering

Fill in lab04g.py with code to implement frequency domain filtering using the fir filter created on line 31.

First with a simple implementation of a single fft on the entire signal.

The second using short time Fourier transforms, or processing the larger signal in blocks as is used in real time systems.

Your output should match the reference output from the scipy signal library. Perhaps this warrants another plot of the difference of your output compared to the reference.