Demo 14: FFT
Exercises

DSP Lab (EE 4163 / EL 6183)

Fall 2017

1 Demo files

```
FFT_test01.py
FFT_test02.py
FFT_test03.py
FFT_test04.py
FFT_test05.py
plot_micinput.py
plot_micinput_spectrum.py
```

2 Exercises

1. **Amplitude Modulation.** The Python program `wavefile_AM_blocking_fix.py` in demo 11   SUBMIT
applies amplitude modulation to a speech signal. Modify this program to plot in real-time the
frequency spectra (Fourier transform) of both the input and output signals (use two different
colors). The Fourier transform should be computed using the FFT. <u>What is the relation between
the spectra of the output and input signals?</u>

2. **Filtering.** Write a Python program that takes the input audio signal from a microphone and
applies a bandpass filter. The bandpass filter should have a passband from 500 Hz to 1000 Hz
(as in previous demo programs). The audio signals should be read and written in blocks. Plot in
real-time the frequency spectra of both the input and output signals (use two different colors).
What is the relation between the two spectra?