

### **Demo 54 - Animation, Pyaudio, and the FFT Exercises**

1. Acquire the microphone signal using pyaudio, implement a high-pass filter as a recursive difference equation; play the output signal using Pyaudio. At the same time, plot the input and output signals and their Fourier transforms using the animate function. An example screen recording is provided. (Your screen recording need only include the output signal, not the input signal.)

[https://drive.google.com/file/d/1hQ-ZLYz45I\\_lxKAoUcPqeGY8MuslqBDh/view?usp=sharing](https://drive.google.com/file/d/1hQ-ZLYz45I_lxKAoUcPqeGY8MuslqBDh/view?usp=sharing)

2. Same as (1.), except implement the AM effect instead of a high-pass filter. In your screen recording, can you illustrate that the AM effect shifts the signal to a higher frequency? Comment on the effect of the AM effect on the spectrum of the signal.

<https://drive.google.com/file/d/1lggF415bn2lyXEI0FcQbKzasQ8xybAw0/view?usp=sharing>

### **To submit**

For each exercises, submit the following items.

1) A brief screen recording (mp4 video file, not exceeding 8 MB).

The audio in your screen recording should have only the output signal (not the microphone signal). In your screen recording, you should say sentences in your own voice.

2) Your python program as a py file.

3) Comments in a pdf file. Include a screenshot of your plot in your pdf document.