

Wave file demos

For python 'wave' library, see:
<https://docs.python.org/2/library/wave.html>

For python 'pack' library see:
<https://docs.python.org/2/library/struct.html>

read_wavfile_01.m

In Matlab, reads 'cat' wav file.
Play signal, plot signal, illustrate quantization, FFT and plot.
Illustrates fftshift, FFT zero-padding

read_wav_example_02.py **read_wav_example_03.py**

Open a wav file in python and read information.

write_sin_01.py

How many bits per sample ?
How many bits per second ?
What if maxAmp is higher than the value used in the demo ? or lower ?
For the stereo, how many bits per second are there ?
What if 'h' is a different code ?
What if number of channels > 2 ?

read_sin_01.m

Plot the spectrum of the sinusoid. The peak in the spectrum better match the frequency of the sinusoid!

write_sin_02.py

Use python to generate a wav file with more bits per sample.
Verify that the spectrum has a peak at the prescribed frequency.
Verify that the number of bits per sample is the prescribed value.

Activities for students (see assignment)

Use Matlab to read in sin_02_mono.wav
- Verify quantization size, is it as expected?

Use Python to generate a .wav file of a sine wave at 8

bits per sample. (How do you do this done ?)

Read your 8 bit/sample wav file into matlab

- verify quantization is as expected, verify spectrum,
- Is there any audible affect of the lower number of bits/second?

Use Python to create a wave file of a sinusoid with a lower frequency, like 50 Hz.
How low can the frequency be before you can not hear it?

Use python to create a wav file with more than two channels. Read the wave file into Matlab and plot the individual channels.

In a stereo wave file, how are the two channels of a stereo audio signal stored?

Use Python to create a wave file of a sinusoid using a higher sampling rate, like 16K 32K or 441,000 samples/second.