

I400: Music Informatics Homework 4, Due April 3

As always, submit all code, plots, and written answers.

1. Consider the spectrum on the web at

<http://www.music.informatics.indiana.edu/courses/I400/spectrum.ps>

- (a) Does this appear to be the spectrum of a single musical note? Why?
- (b) Which FFT “bin” seems to be associated with the fundamental frequency of the sound?
- (c) The FFT length in this example is $N=512$ while the sampling rate is $SR = 8\text{KHz}$. Estimate the frequency of the pitch.
- (d) How many half steps above or below A440 is this note?

2. Consider the first 8 notes highlighted in yellow for the spectrogram at

http://xavier.informatics.indiana.edu/~craphael/acm/mozart_4tet_image.bmp The first two notes are MIDI pitches 80 and 79. Given the MIDI pitches of the remaining 6 notes (up to the vertical green line).

3. Look at the spectra in the directory

http://www.music.informatics.indiana.edu/courses/I400/sound_effects

where you will find 5 .wav files and 5 corresponding spectrograms (.ps files). Listen to the wave files and view the spectrograms to figure out which goes with which.