Appendix I – Matlab Code

The file `rock.m` was written to remove noise from the acoustic guitar recordings I had done. It is commented fairly well. The program basically inputs a `.bin` file (or other file that Matlab can process as an array of numbers) and removes frequencies that are below 50Hz. Most of the noise captured from the anechoic chamber recordings was below this frequency. Also, the lowest note recorded, B (61.7 Hz) is above this frequency.

`local_max.m` finds the index (sample number) of a local maximum when viewing Fourier transforms of plucked strings. You have to give it an FFT and a general idea of where to look for the local maximum. If you know the fundamental frequency of the plucked string, the local maximums should occur at integer multiples of that frequency on the FFT.

`harmonic_ratios.m` is the most useful code included here. This is the code that generated the information for Appendix II & III. The function takes a `.wav` file and the number the string being plucked and it returns the values of higher order harmonics over time. These values are broken up into 4 different chronological FFTs. The code generates the strength of a fundamental and 9 higher order harmonics as a percentage of the original fundamental's amplitude. The values correspond to, but are not equal to sound pressure and voltage, not decibels.