

# Latex problem set 8

bs4270

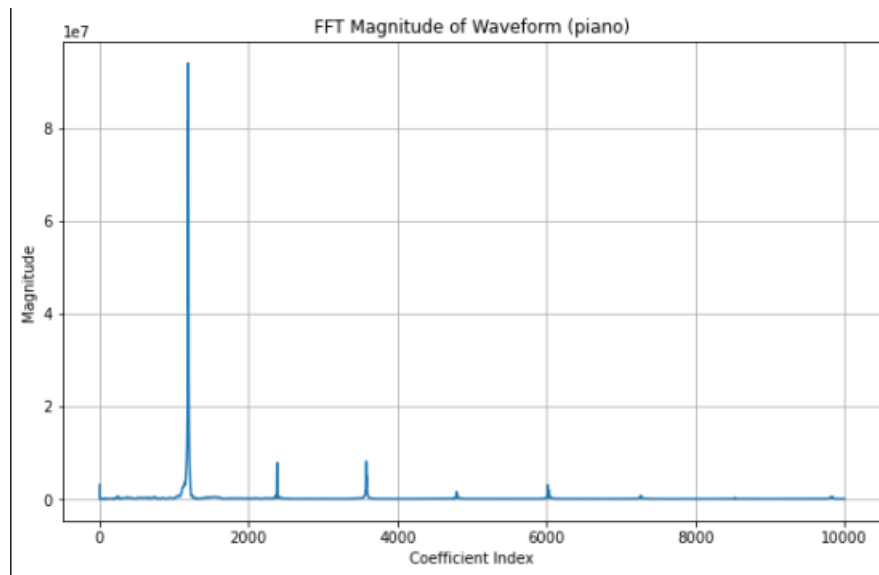
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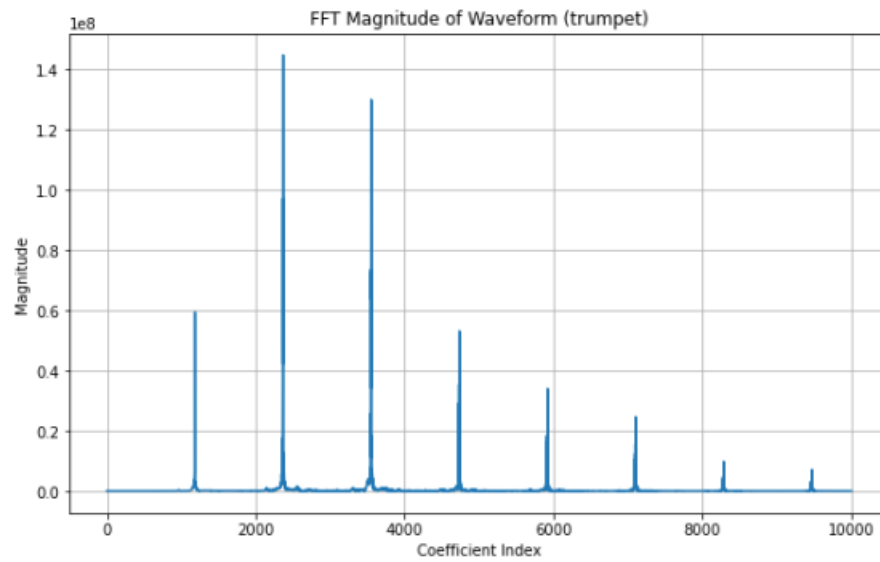
github repo username: brandonsato1

## 1 Problem 1

### 1.1 a

Code created in order to find coefficient Index vs magnitude of FFT transformation of piano.txt and trumpet.txt. FFT completed using numpy method. The results would suggest that trumpets have more complex sounds that involve a number of different pitches, that appear to be the same note at different octaves, whereas the piano plays a more clear and crisp sound of one pitch with smaller other octaves.





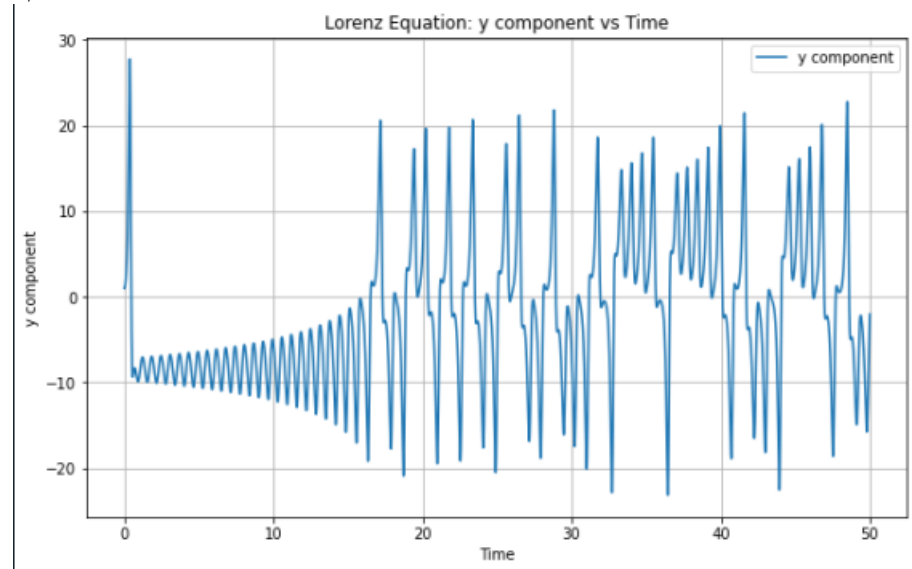
## 1.2 b

Largest peak at index 2367. Conversion completed by multiplying by sampling rate of 44100 and dividing by fft size of 10,000 points. The result is 10438.47hz, which is approximately the note E which is at 10548hz according to wikipedia.

## 2 Problem 2

## 2.1

Solution to Lorentz Transformation equation plotted with  $\sigma = 10$ ,  $r = 28$ ,  $b = 8/3$  between  $t=0$  to  $t=50$ .



## 2.2

Z and X axes plotted instead of Y and time

