ECE 4163 DSP Project

Project Name: Real-time Piano Keyboard Notes Classifier

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Project Description:

In this project, we will apply some of the important concepts we have learned in class. The project Real-time Piano Keyboard Notes Classifier aims to identify different music notes being played in real-time on a piano keyboard primarily based on an important property, the frequency of the notes. We know that a standard piano has 88 keys: 52 white and 36 black. In our program, we will limit our scope to include only from the 37th to the 60th key (C4 to B5) on an 88-key piano keyboard, Middle C interval and its right interval.

When the program is running, we will play some random notes one at a time or play a combination of random notes at the same time on a keyboard, and the program should be able to tell us which note or notes we are playing. The feedback of the program will be the notes it successfully identifies. In short, we will play different notes on a piano keyboard and the program will tell us which notes are played. Both will happen in real-time.

The way we are going to visualize in real-time the feedback from the program is to implement a GUI in Python. The implementation of GUI is similar to what was done in the past homework assignment but more. On our GUI, there will be a “piano keyboard” on which every key, black or white, is arranged exactly as it is on a real piano keyboard. When we play one key or many keys, the pressed key or keys will be highlighted with some colors indicating that the key or the keys are pressed. Since we will only do a certain section of keys from all the keys on a standard piano keyboard, the “keyboard” displayed on the GUI will just correspond to that section of the keyboard. It is shorter, but functionality wise, there is no difference.