

Tyler:

- Make GUI with multitrack playback
 - Basic graphics
 - Can select track to record to (out of 8)
 - Include on-screen buttons for playback and recording
 - Includes naming tracks
 - Uses physical buttons & switches as controls
 - Includes on-screen button for learning
 - Includes status bar for playback, looping etc.
 - Using mouse and on-screen ascii keyboard
 - Drop-down menus for instrument selection
 - Better graphics
- SD card functionality
 - Able to write to and read from BRAM and SD Card

Brandon:

- Identify fundamental frequency
 - Take FFT
 - Pass through FIR Low Pass
 - Identify the largest frequency bin
- Can identify harmonic coefficients
 - Identify harmonics based on ideal harmonics structure
- Use of a more sophisticated fundamental frequency identification technique such as a gaussian convolution

Matt

- Take sets of harmonics that represent instruments (piano, trumpet) and convert a fundamental into the desired frequencies
- Convert these frequencies back into a waveform and output at desired frequency (~20 kHz) through FIR low pass and PWM
- Use learned sets of harmonics at integer multiples to convert a fundamental into the frequencies that correspond to one of our learned instruments

- Address phase offsets between fundamental frequency and overtones so that the added waveforms are all in phase and we eliminate any artifacts of the FFT frequency
- Optimize the timing so that we can approach real time synthesis (total delay < ~25 ms)