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)