6.111 Final Project Checklist: E.D.I.T.H.
Roberto Ramirez and Timi

Modules:
- FFT Module: Breaks the incoming audio into the frequency domain and seeks for peaks in the audio to correlate words and tone detection
- RGB to HSV: Converts a RGB pixel values to HSV values so that certain colors can be detected
- Erosion: Erodes away boundaries of regions of pixels of a certain colors to ensure that the LED can be detected correctly
- Filter: Will eliminate unwanted noise to make the movement of the mouse smoother
- Object Position: Will calculate the distance of the LED from the center of the image and use that distance to calculate the speed of the mouse in a certain direction, which will be fed to the Teensy
- Mouse State FSM: Will determine what actions the mouse should currently be performing (i.e. moving, clicking, etc)

The Commitment:

Minimum Viable Product:
❖ High and low tone detection
➢ High tone for double left click
➢ Low tone for right click
❖ LED light to track mouse coordinates onto the monitor
❖ Copper strip wires that when connected on the fingers acts as selection buttons
➢ This will be done through a wired connection
❖ Filters
➢ To protect from noise on both the audio and visual fronts
❖ Wired connection to the FPGA to complement an MVP
❖ Be able to obtain basic control of a monitor with a hand as a mouse and two basic tones

Expected:
❖ Added functionality on button selection
➢ The high tone will correspond as a redo button
➢ The low tone will act as an undo button
❖ Audio programmable mode
  ➢ Be able to train a specific tone that the FPGA recognizes as a specific command may be to act as a delete key
❖ RGB LEDs to act as selection tools on the mouse
  ➢ Red may correspond to right click
  ➢ Green may correspond to double left click
  ➢ Blue may correspond to left click
❖ Go Fully wireless
  ➢ Glove battery pack, so the glove can be used anywhere
  ➢ Teensy FPGA bluetooth connection
❖ Be able to partially use a hand as a mouse with voice as a helper function - all completely wirelessly

Stretch:
❖ Increased added functionality on button selection
  ➢ A continuous high tone will act as a scroll up
  ➢ A continuous low tone will act as a scroll down
❖ Basic word recognition
  ➢ Potentially train the FPGA to recognize certain words in order to give commands
❖ The ability to chain mouse sensitivity
  ➢ For ease of use
❖ Be able to change the LED color, for preference without losing functionality in moving the mouse
❖ Be able to use your hand and voice to freely control a computer monitor