Introduction to Programming II Project Log

Project Title: **Music Visualizer**	
Topic: Week 14, July 11-17	**Wave Pattern-GLSL extension** -Shader files must be loaded in sketch.js -preload -Lots of tinkering with GLSL fragment shader -Drawing onto different buffers went smoothly -Completed with resize bug remaining, need to find best way to handle window resize **Spectrum Extension-Capsules** -While experimenting with ideas for my proposed 'Pendulum' extension I discovered a nice effect and decided to repurpose it for this Spectrum extension. -Completed. Very easy with a nice result. **Refactoring**
Topic: Week 15, July 18-24	**Rapidly Exploring Random Tree extension** -More confident with javascript now, decide to adjust plans and discard 'Pendulum' extension in favor of this extension which will require more involved algorithms and data structures. -Research Rapidly Exploring Random Trees (RRT) and kd-trees -Start to implement kd-tree first, somewhat functional. -Implement RTT and drawing functions so I can visualize and see what's working and what is not working. -Progressively track down bugs and learn quite a bit about javascript as well. W3Schools is a great resource. -Working well now, add variables to allow music to drive the appearance. **3D Road extension** -Original '3D Object' extension idea turns out to be unfeasible, drawing is far too slow. -Start '3D Road', good progress. -Plane representing city background has some issues when resized. Add that to the list of resize bugs. **Refactoring**
Topic: Week 16, July 25-31	**3D Waves extension** -Works but it's molasses slow. Do a lot of digging in p5.js source and find some answers at p5.js Github issues. (Overall lesson learned from this extension and '3D Road' extension: don't use p5.js for anything but very simple 3d, straight WebGL or Three.js would've been better choices) -Works, runs fast, ugly and boring. -Reposition camera, mirror wave object vertically, adjust material, add lights. Result is impressive (to me) **GUI** -Initial experimentation and a simple proof of concept -Extremely fast progress, everything just works, why does

	javascript get so much hate? -'Controls and Input' can be removed. -Add gui objects to Spectrum-Capsule and spectrogram extension to allow users to adjust settings **Refactoring**
Topic: Week 17, Aug 1-7	**Fix Resize Bugs** - Fix was simple, just make the offscreen buffers a fixed size, no need to resize them. **Testing** - Research Rapidly Exploring Random Trees (RTT) is slow, used profiler to identify problem areas. Drawing lots of lines is really slow. Was able to speed it up but not as much as I would like. -Profiler helps to find another slow section of RTT, was doing an unnecessary comparison of points in kdtree. -More (probably unnecessary) 'optimizations' on sort function and arrays. -Test on different setups, older Windows PC Chrome/Edge with integrated graphics, 2015 Macbook Chrome/Safari with integrated graphics. -Older Windows PC is not so bad as long as it's not set to 4k fullscreen. -Macbook is a disappointment on Chrome and WebGL doesn't seem to work properly on Safari -Best experience on Windows (Chrome) with discrete GPU **Clean up** -remove unused files -remove 'commented-out' code