6.111 Final Project Checkoff Checklist (Auralization of the Visual World.)

Video Decoding:
        Accepts NTSC Video, and produces streaming HSV output.
                Verification: demonstration in simulation on fabricated data. functioning with other modules. pass through to NTSC video out (optional.)

Video Chromatic processing:
        Accepts streaming HSV input, extracts HSV information for the most common pixels (mode filter)
                Verification: demonstration in simulation. model on labkit using pass-through to logic analyzer.

Video Object detection:
        Accepts streaming HSV input, outputs location and scale of objects (when detected.)
                Verification: simulation + fabricated/known images. Functioning with other modules. overlay on passed-through video output (optional.)

Hardware input translation, Video input translation:
        Takes video and hardware inputs, produces control signals
                Verification: correct function with other modules
Sequencer
        Accepts control signals, outputs frequency domain information to Frequency Domain FX, triggers for the sampler
                Verification: Simulation, integration with other modules, partial test with midi output and control input.

Frequency Domain FX:
        Applies effects to the output of the sequencer which are easy in frequency space and harder in time space (reverb, filters)
                Verification: Simulation, instantiation + analyzer
IFFT/synthesizer:
        Accepts frequency domain data and a 48kHz ready signal. Provides buffered output of the corresponding time domain signal, with appropriate phase correction
                Verification: simulation, mockup on labkit outputting to the logic analyzer, correct functioning with other modules, observation on O-scope as spectrum analyzer. JTAG interface debugging (optional.)

Sampler:
        Accepts a 48kHz ready signal, and numbered start-sample triggers. outputs [channel number, value] pairs.
                Verification: simulation, instantiation on labkit with inputs tied to hardware and outputs tied to AC'97

Channel Aggregator/Mixer:

Accepts serial stream of [Channel, value] pairs, outputs serial stream of [channel, value] pairs, where these may be aggregated.

Verification: simulation, function with other units.

Effects units:

Accept enable, serial stream of [Channel, value] pairs, 48kHz enable, address WOE. Outputs Z when not addressed, effects output when addressed.

Verification: simulation, instantiation on labkit with aggregator/mixer tied to AC'97 input/output as an effects unit.

System Integration:

Control of sequencer synth bank with spectral analysis.

Control of sequencer sampler triggers with object tracking.

Control of sequencer parameters with hardware inputs

Control of IFFT by sequencer/Frequency Domain FX output

Control of Sampler with object tracking and sequencer output

Application of effects to combined sampler/synth output.

Audio generation (AC'97 interface.)