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.)