Final Project Report Rubrics

## Written Description

* Description of the overview of the circuit
  + What is the purpose of the circuit?
    - This should be given as a summary, from a high level. For example, if they used an SoC, this should describe what functions the Nios II does and what functions the hardware does.
  + What are its features?
    - This can be similar to the proposal, but should describe the features actually implemented by the circuit. This gives context to the rest of the report.
* Description of the general flow of the circuit
  + What are the inputs/outputs?
    - This is the inputs to the top level, they should be grouped by functionality if they are not obvious (not things we used typically in Labs 4-9) E.g. AUD\_MCLK, AUD\_LRCLK, etc.
  + How are the inputs/outputs processed
    - What happens to the data on the inputs, how are they processed to generate the outputs?
  + What’s shown as the outputs?
    - How do we know when the outputs are correct, what should the audio sound like, what should be displayed on the screen, etc.

## Module Description

* Describe the purpose and operation of each entity, describing its inputs and outputs.
* This should show more insight than just the code
  + Example of poor description: *DrawX is an input signal which is 16 bits wide. It is of type logic.*
  + Better description: *DrawX is a signal which tells the sprite unit the current X coordinate of the VGA controller. It is used by the sprite unit to determine when it should draw the current sprite. It is 16 bits wide, but in practice, only goes up to value 800.*

## Design Procedure / State Diagram / Simulation Waveform

* Overview of the design procedure
  + What project/codes is used as the foundation of the project?
  + What are the different objectives of the project (choices of inputs, state machine, sprites, algorithm IPs, storage units, choices of outputs)?
  + What research/background study has been done to achieve the objectives?
  + How are the different objectives linked together to form a complete project?
* If some sort of serial processing is used, especially for the projects that deals with algorithms, a state machine and a simulation waveform should be included in the report
  + State Diagram can be either hand-drawn or Quartus-generated
  + If a state machine and/or simulation waveform is not used, then the students will need to justify it (e.g., pure graphics, FSM way too simple (game start, game, game end), etc.)

## Block Diagram

* Block diagram must be as detailed as the schematic diagram from Quartus, with all modules, ports and interconnections labeled
* Block diagram must show at least the declarations and interconnections of most of the modules. A super-top-level block diagram with most of the modules hidden underneath an enormous wrapper module (e.g., a “CPU” module which encompasses all the details) is NOT acceptable. If this is necessary, then they must show each level of the hierarchy.
* Block diagram must be legible (e.g. if it’s just a print out of the Quartus diagram and it is illegible due to too many modules/signals, the student should lose points).

## SV Code

* Existence and sanity of the modules – Note: **if modules don’t exist as compared to what was demonstrated, you should ask the students for an explanation, or otherwise be suspicious that this may be an academic integrity violation.**

# Hints for Grading Post-Lab Part

## Design statistics and Discussions

* Fill in the table with numbers that makes sense

## Conclusion

* Students should document all corrections they made during the debug phase if their original code contains flaws
* If students failed or partially failed their demo they should explain any possible causes and the potential remedies
* Student should summarize their accomplishments