

Assignment 0:

This assignment will give you experience on how to *model* a specification using FSM, and use of some tools to *design and test* high-level IP module. In this assignment, you will consider “Interrupt Handler” (IH) for specifications and develop its “finite state machine” (FSM) model. Then using tools, you will obtain Verilog module for IH and verify its functionality. Use the following steps to complete this assignment. Team of two students can work together on this assignment and demonstrate to get credits.

1a: Understand interrupt handler functionality to specify its protocol at high-level. State the Interrupt Handler specification. (15 points)

1b: You will hand draw FSM model that corresponds to your stated specification in 1a. Label various states of FSM and show the state transitions. (20 points)

2. Refer FSM Design tool “Fizzim” by visiting <http://www.fizzim.com>. A tutorial on Fizzim is found at <http://www.fizzim.com/tutorial.html>. You have to set up your window environment with active Perl and Java runtime if you don’t have them yet.

2a: Follow the tutorial and using Fizzim GUI you will create FSM model of “Three Cycle High Laser Controller” given in the FSM tutorial. Generate Verilog Module from the model using Fizzim. Compare the Fizzim generated Verilog code with that of the code given in the FSM tutorial. Comment on your results. (10 points)

2b. Use another tool ModelSim for functional verification of the Verilog IP module generated above. ModelSim can be downloaded freely from Mentor Graphics. You will use the Test bench given in FSM tutorial to verify your IP. Provide the results. (15 points)

3a: Create FSM model in Step 1b using Fizzim GUI and use the tool to generate Verilog IP corresponding to Interrupt Handler. Identify the blocks that are corresponding to various states in the FSM. (20 points)

3b: Functionally verify the blocks using ModelSim. You will design TestBench for verification. (20 points).

References:

1. <http://www.fizzim.com>
2. ModelSim from Mentor Graphics
3. Tutorial on “Modeling and Testing FSM of Three Cycle High Laser Controller” problem.
4. Interrupt Controller references