Lab 5 Report

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CSE 369: Intro to Digital Design

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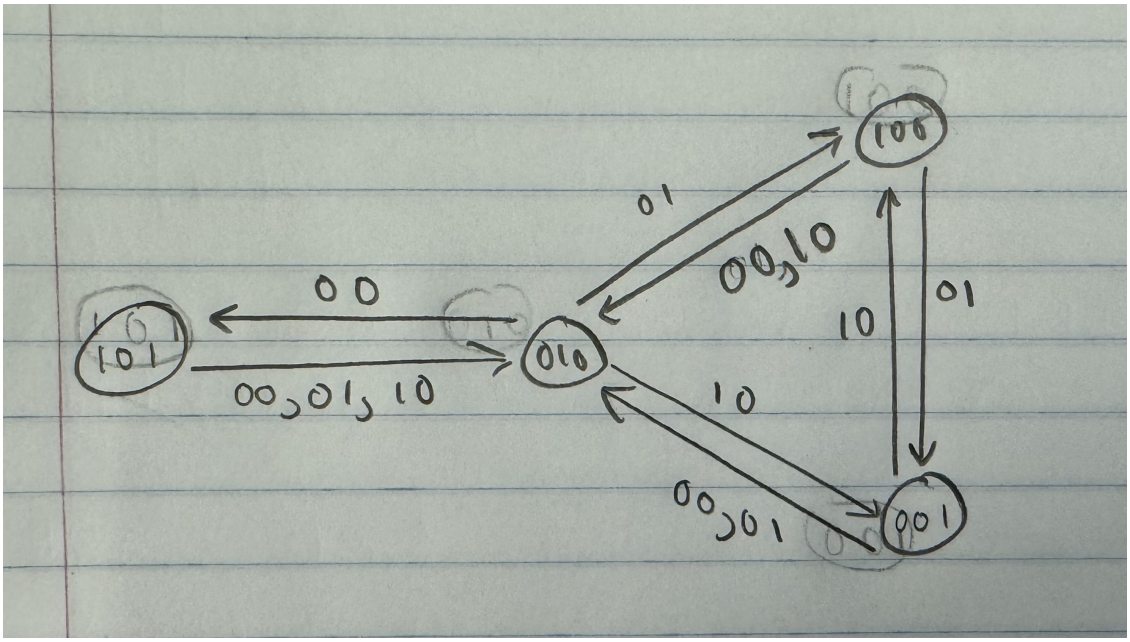
Task 2 – FSM

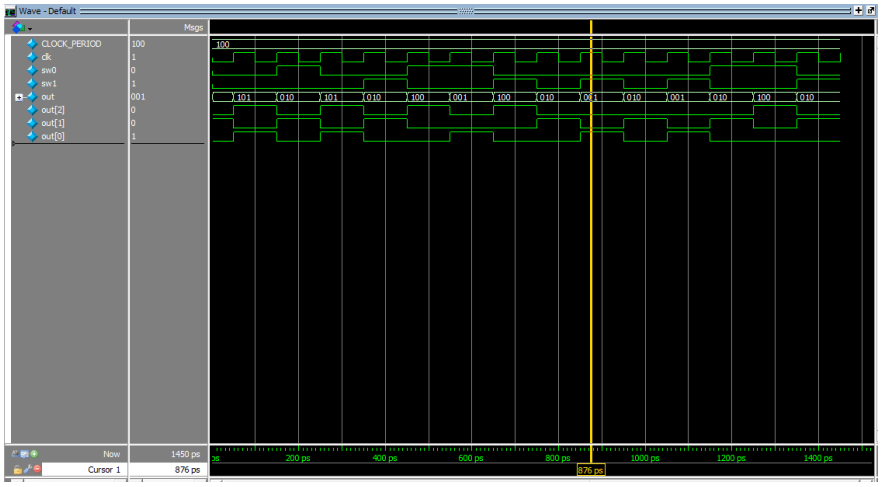
Question:
A drawing of your Finite State Machine.

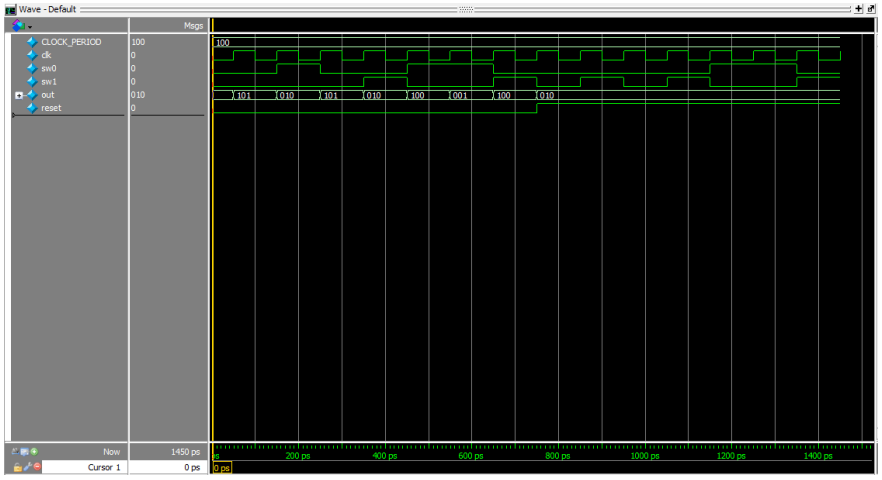


The above FSM models the runway lights. The light state of 101 should always go back to 010 to minimize the number of transitions, and because 010 is included in all patterns. 010, is a central node that goes to a different place on each of the three different inputs. 100 and 001 both map back to 010 in the case that the input does not map them to each other directly.

Task 2 – ModelSim

Question:
A screenshot of the ModelSim simulations you will demonstrate during the demo.

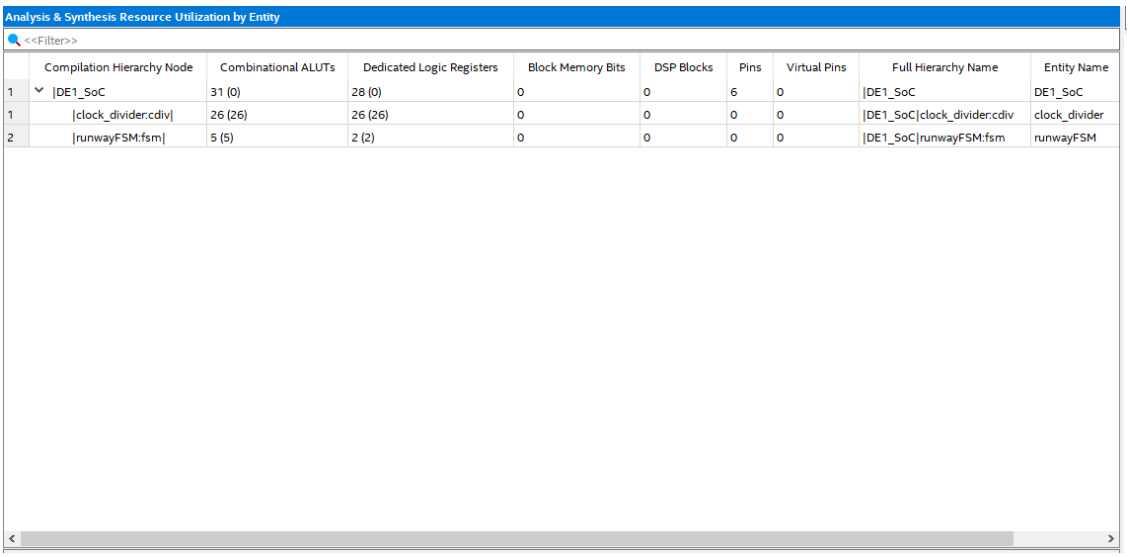




The modelsim maps over all the pathways of the FSM. It starts at the 101 state, and runs through all the 12 transitions seen in the FSM diagram. This happens at every clocks positive edge as seen in the diagram. The top showcases every route, the bottom shows the when the reset button is held, resulting in the state reverting to 010.

Task 2 - Resource Utilization

Question:
A screenshot of the "Resource Utilization by Entity" page, showing your design's computed size.



Analysis & Synthesis Resource Utilization by Entity

<<Filter>>

	Compilation Hierarchy Node	Combinational ALUTs	Dedicated Logic Registers	Block Memory Bits	DSP Blocks	Pins	Virtual Pins	Full Hierarchy Name	Entity Name
1	|DE1_SoC	31 (0)	28 (0)	0	0	6	0	|DE1_SoC	DE1_SoC
1	|clock_divider:cdiv|	26 (26)	26 (26)	0	0	0	0	|DE1_SoC|clock_divider:cdiv	clock_divider
2	|runwayFSM:fsm|	5 (5)	2 (2)	0	0	0	0	|DE1_SoC|runwayFSM:fsm	runwayFSM

The resource utilization is $5 + 2 = 7$.

Reflection

Question:
How long did it take you?

Completing all of the lab took me around 1-1.5 hours