CPEN 311: Lab 5

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Directory Path of SOF File

The SOF file for this lab is located in the rtl folder of the submission. It is called "dds_and_nios_lab_time_limited.sof".

Status of the Lab

This lab is fully functional. It does everything that the lab handout says, and is identical to the given solution. The bonus was not implemented

How to Run the Simulations

To run the simulations, follow the instructions below:

1. Go to the sim directory, and open "Lab_5.mpf" with ModelSim.
2. To run a simulation, click on "Start Simulation", which is located under "Simulate", in the top toolbar. This will open a "Start Simulation" window.
3. In the "Start Simulation" window, expand the "work" directory, choose the desired testbench "_tb" file, and click "OK".
4. Choose the desired signals to show on the wave form, and then run the simulation. To run the simulation, go to "Simulate", and then, under "Run", click on "Run -All". This will update the waveform window to show the results of the simulation.

Additional Information

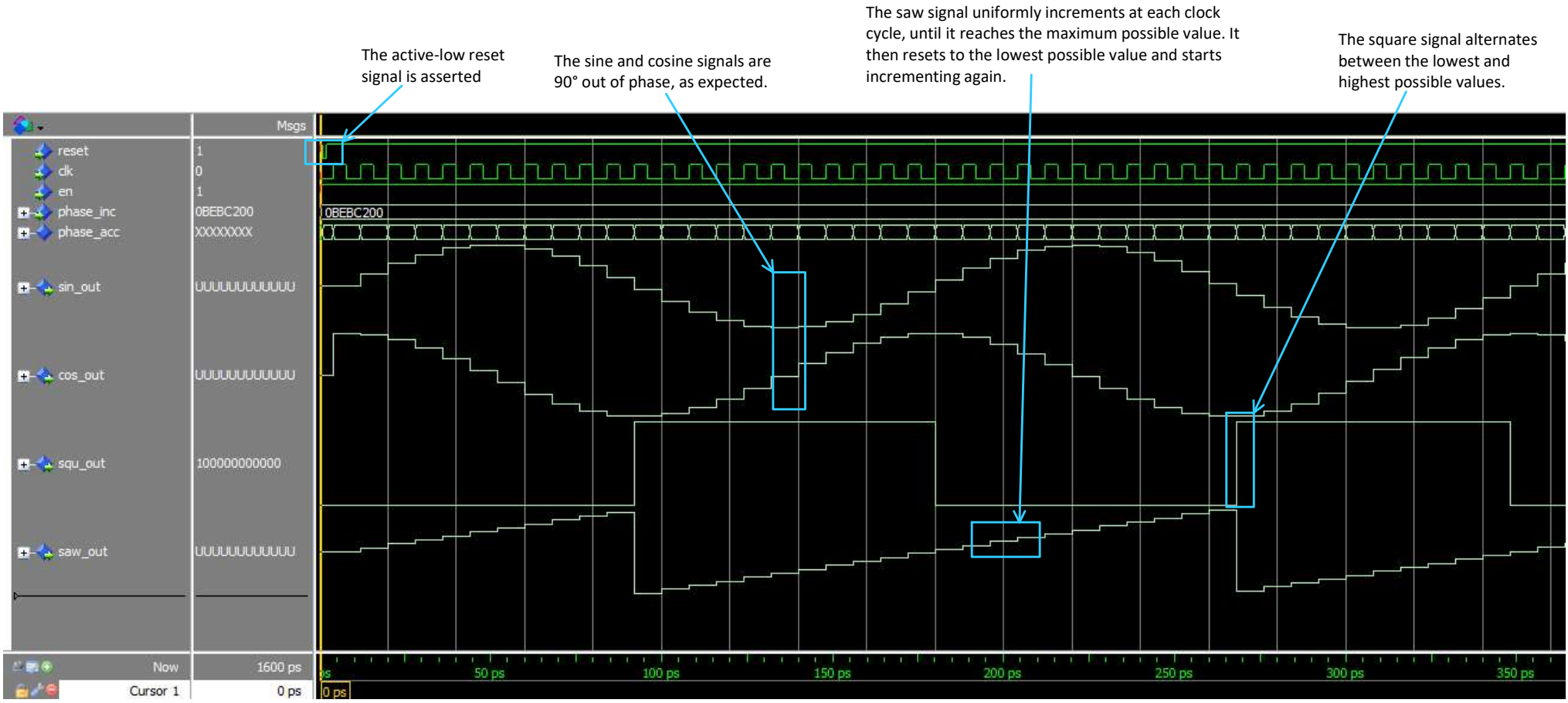
If something appears to be missing, or if a file is corrupt or not working, please email us at ardavanpourkeramati@gmail.com or joshua.wu2009@gmail.com.

Annotated Simulation of LFSR

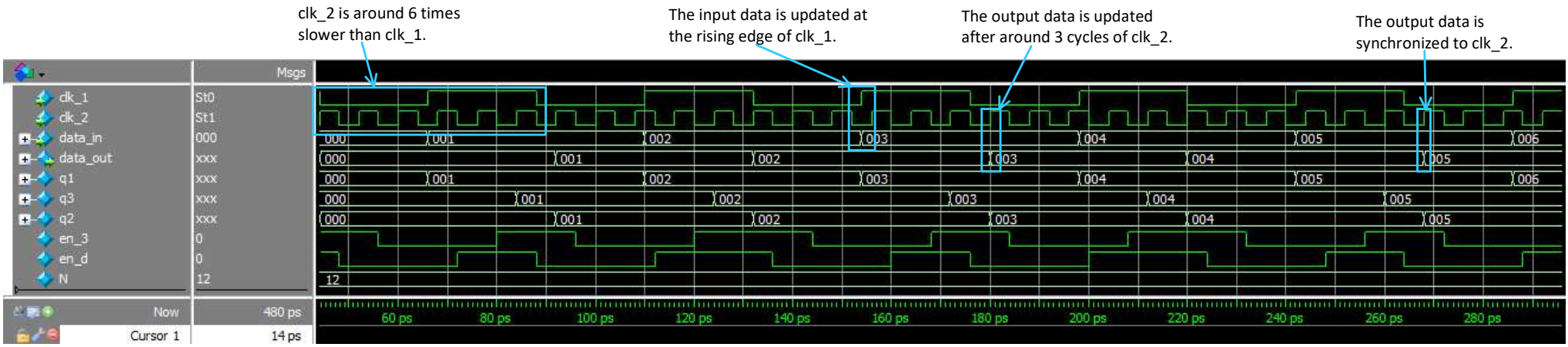
At the rising edge of each clock, the lfsr output is updated to the next pseudo-random value.

The lfsr values are identical to the values in the Lab 5 instruction manual.

Annotated Simulation of DDS



Annotated Simulation of Slow to Fast Synchronizer

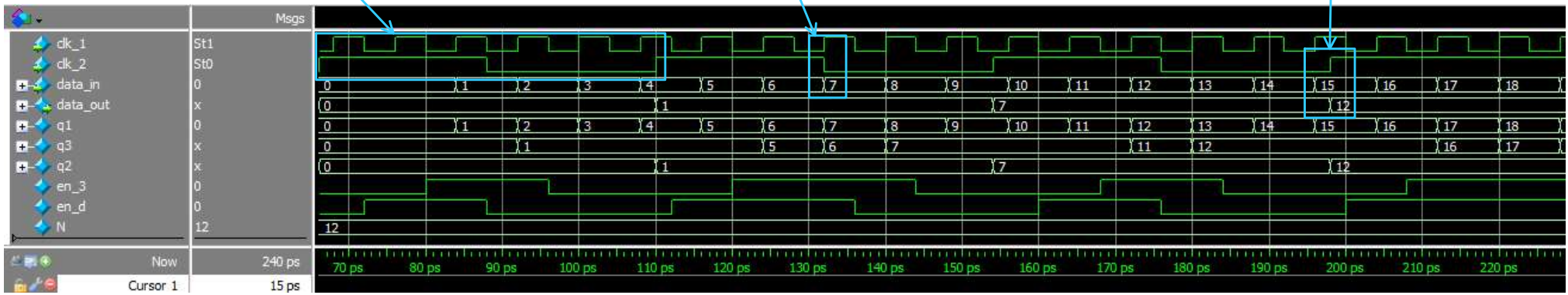


Annotated Simulation of Fast to Slow Synchronizer

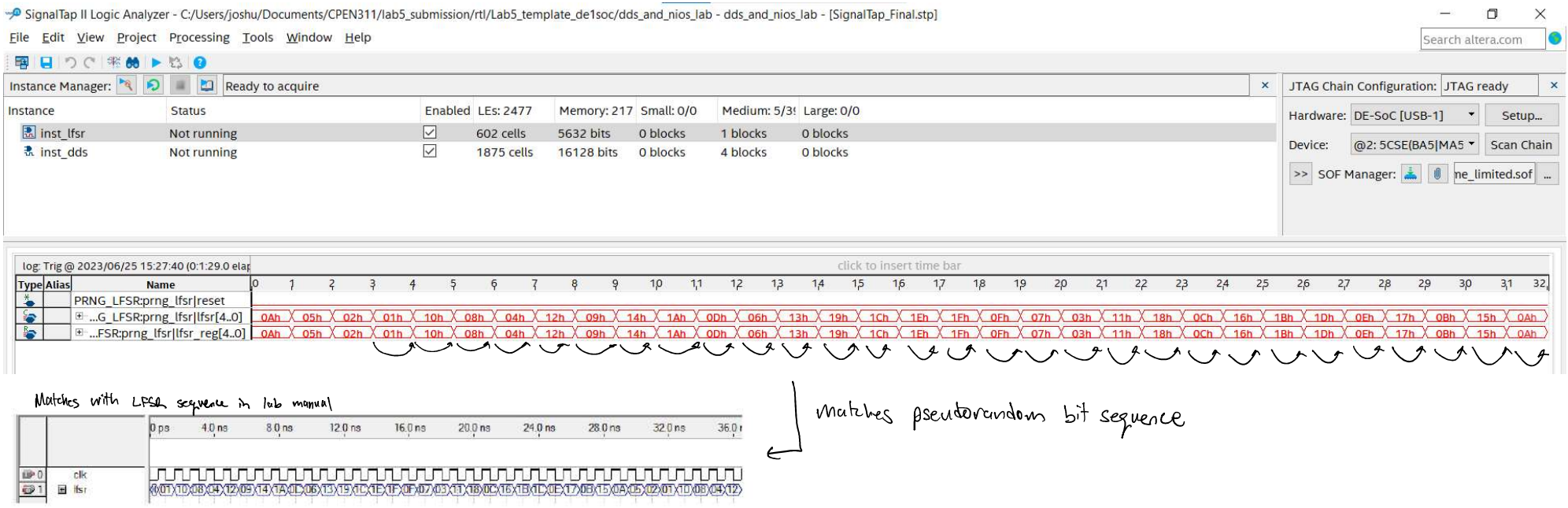
clk_1 is around 6 times faster than clk_2.

The input data is updated on each rising edge of clk_1.

On each rising edge of clk_2, the output data is updated with the input data from around 2-3 clk_1 cycles ago. This is due to how the input data is captured and stored for synchronization purposes.



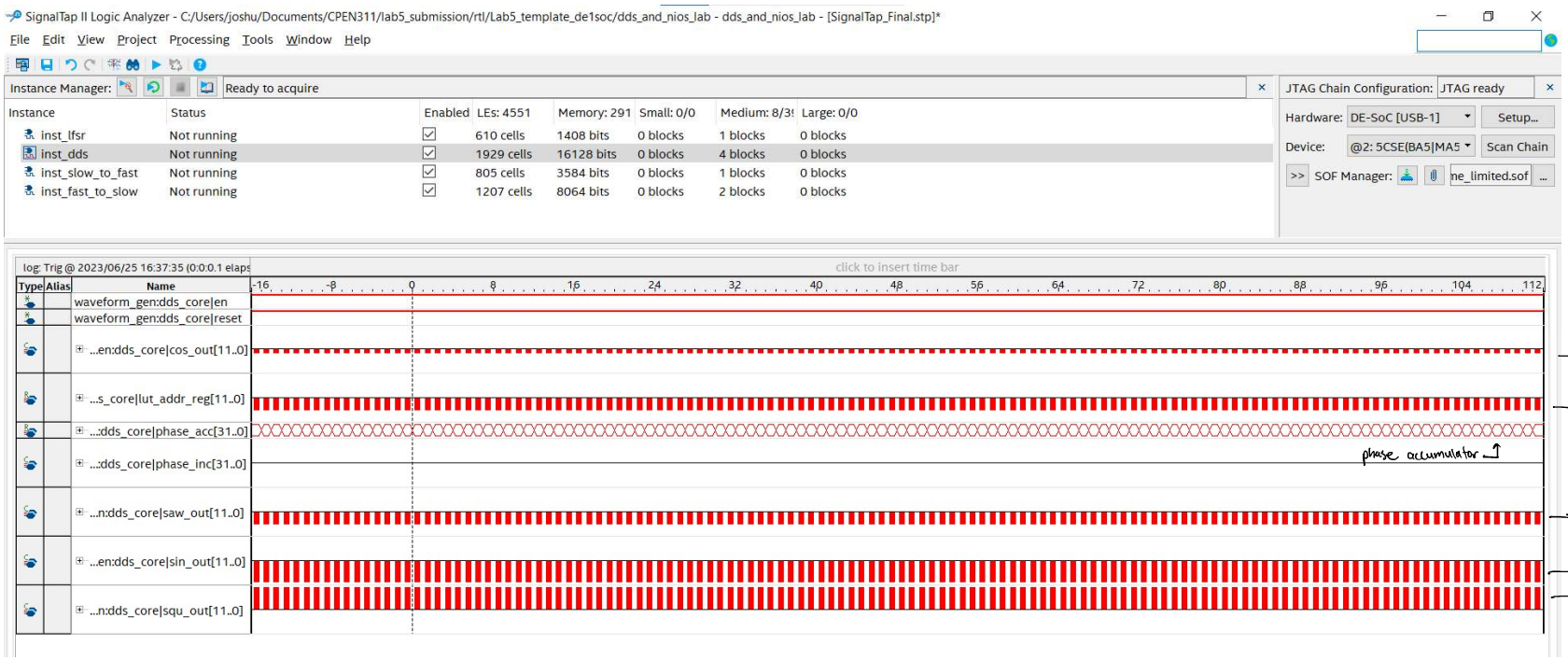
SignalTap Annotation of LFSR Instantiation

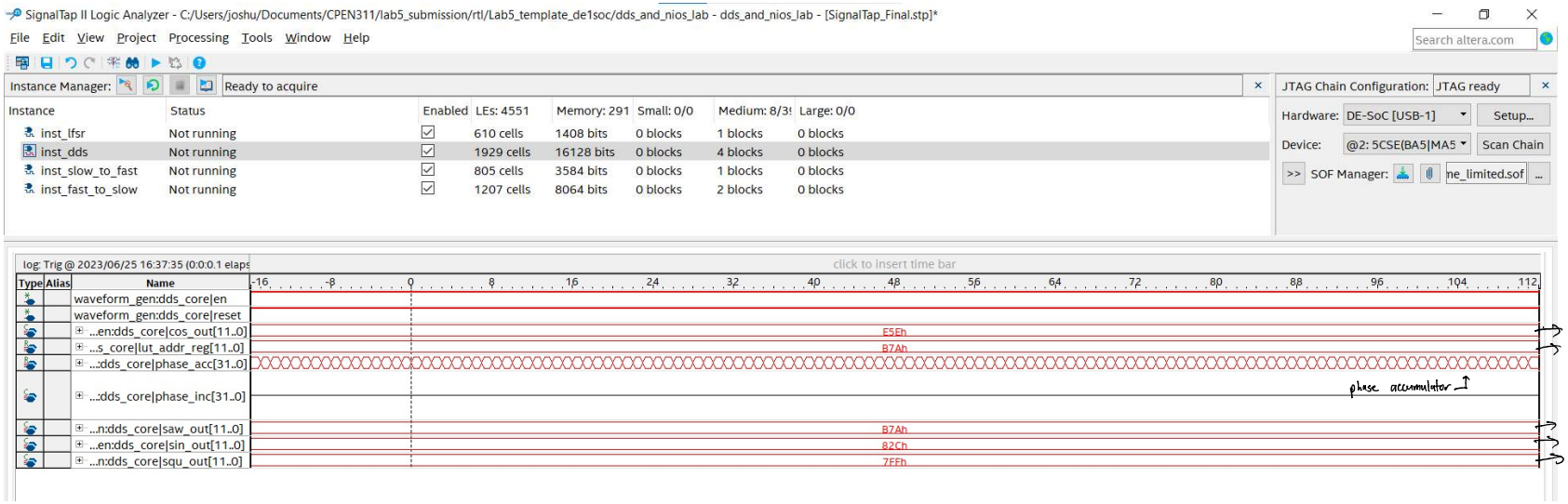


Matches with LFSR sequence in lab manual

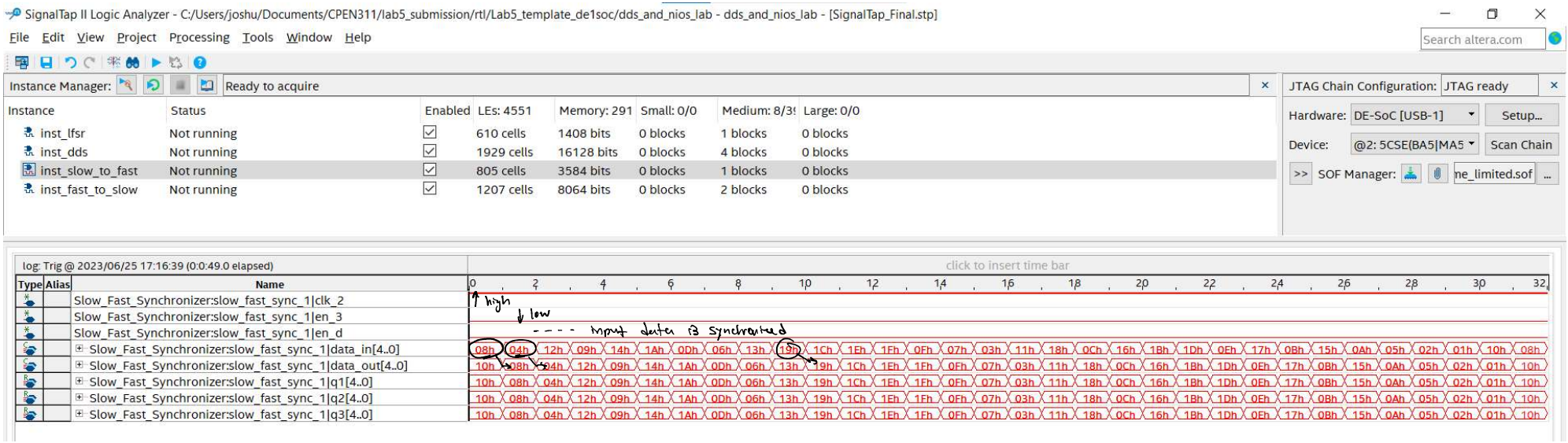
matches pseudorandom bit sequence

SignalTap Annotation of DDS Instantiation





SignalTap Annotation of Slow to Fast Instantiation



SignalTap Annotation of Fast to Slow Instantiation