ENEL 453 LAB 4 – SUBMISSION

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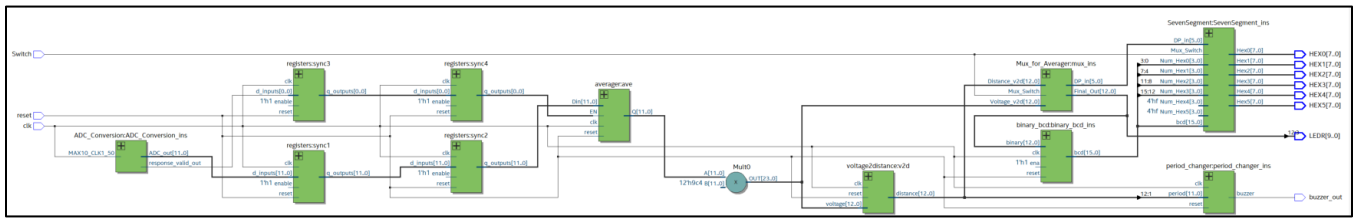
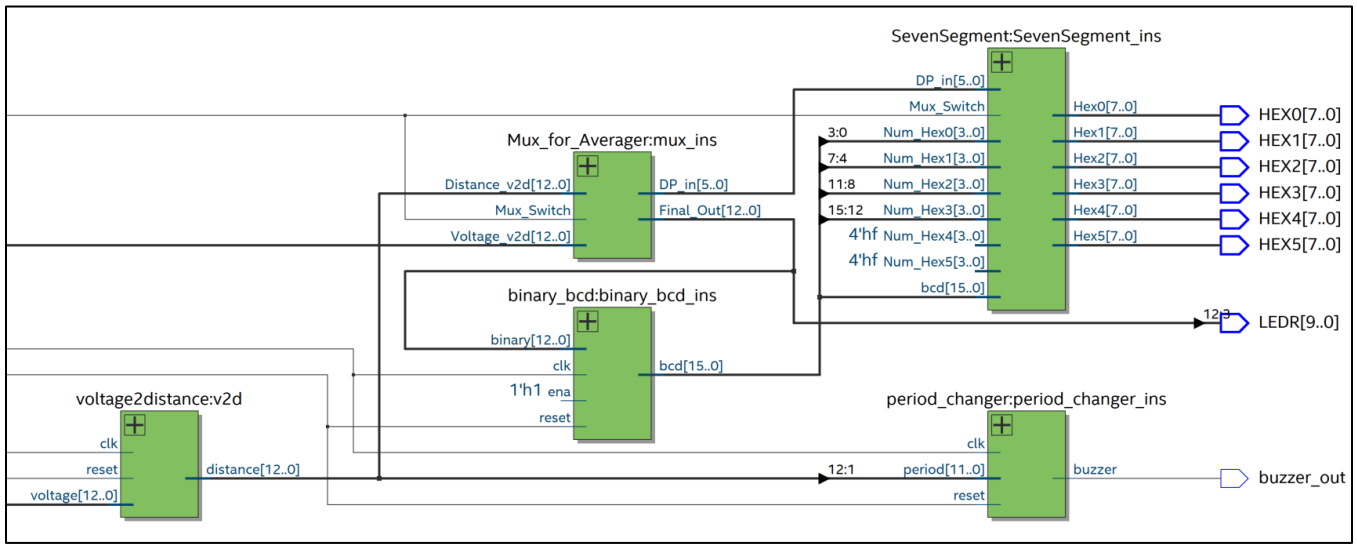
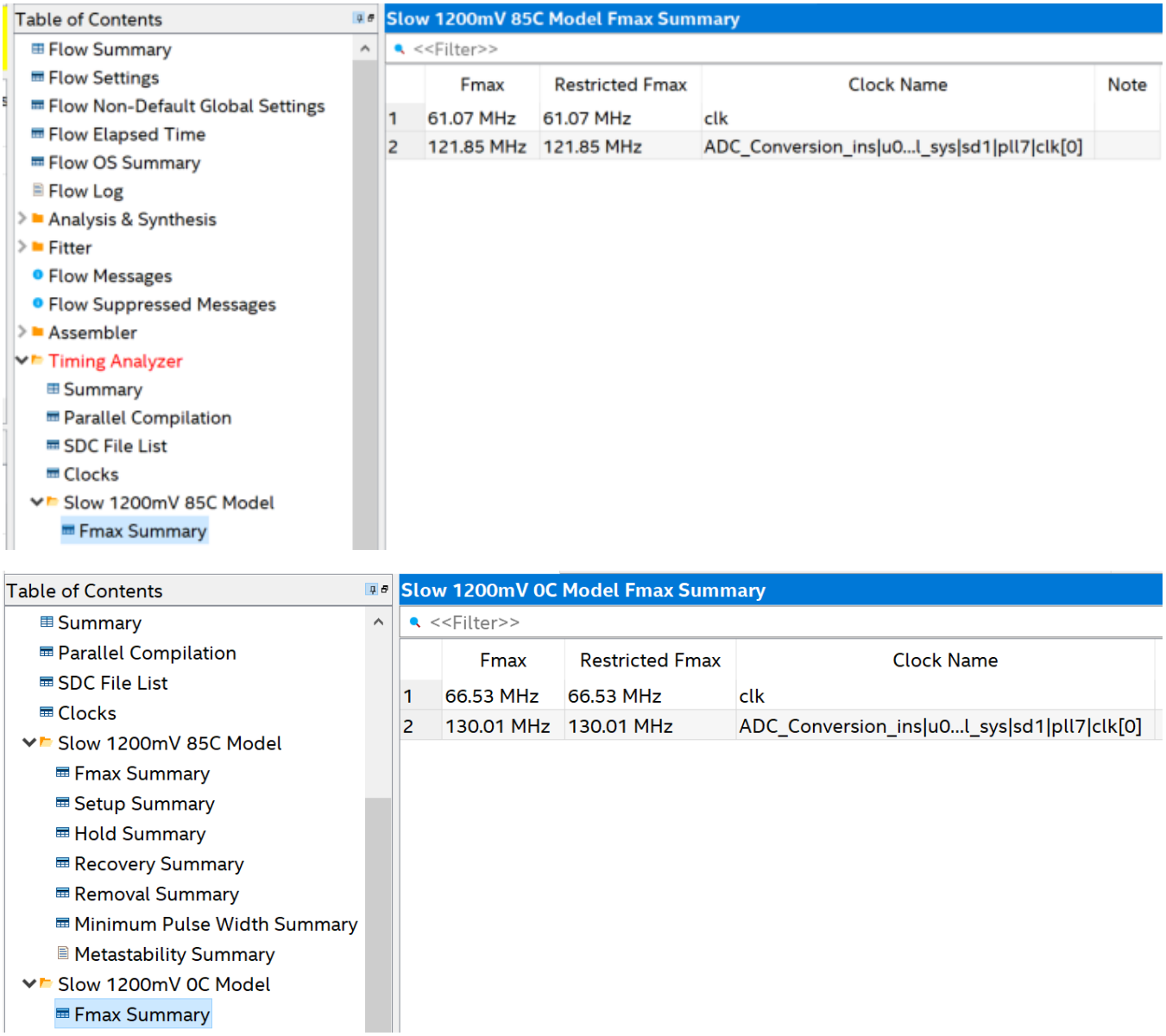
Top level RTL Schematic:

Note: the first figure shows the full RTL design, and the second figure is zoomed into the right portion (where we've added a new final for lab 4). The PWM output comes from the period_changer component.





Screenshot of timing analysis:



Screenshot of Waveform Simulation:

Note: random binary values were placed inside a newly-created input called "test_input" to verify the correct operations of "buzzer_out" for the ModelSim simulation. Buzzer_out can be seen to be changing in accordance with the specified requirements to generate the desired pitch. As can be seen, the bigger the test_input the lower frequency buzzer_out has (and thus, pitch is lower representing further distance). The opposite is also true. Reset can also be seen working (buzzer_out = 0 when reset = 1).