

ModelSim Simulation: Buzzer & Mux4_1

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Objective:

The objective of this assignment is to create a Buzzer circuit simulation using Modelsim and subsequently create mux_4_1 circuit with.

Description of Specifications, and Functionality:

The digital system I used in this assignment is ModelSimSetup-20.1.1. In the VHDL editor, I wrote my VHDL code to get the circuit output and then used Modelsim to simulate and run my circuit over time (ns unit).

I. Buzzer Circuit

In figure 1, I inserted my code from the page and then compiled *buzzer.vhd* successfully.

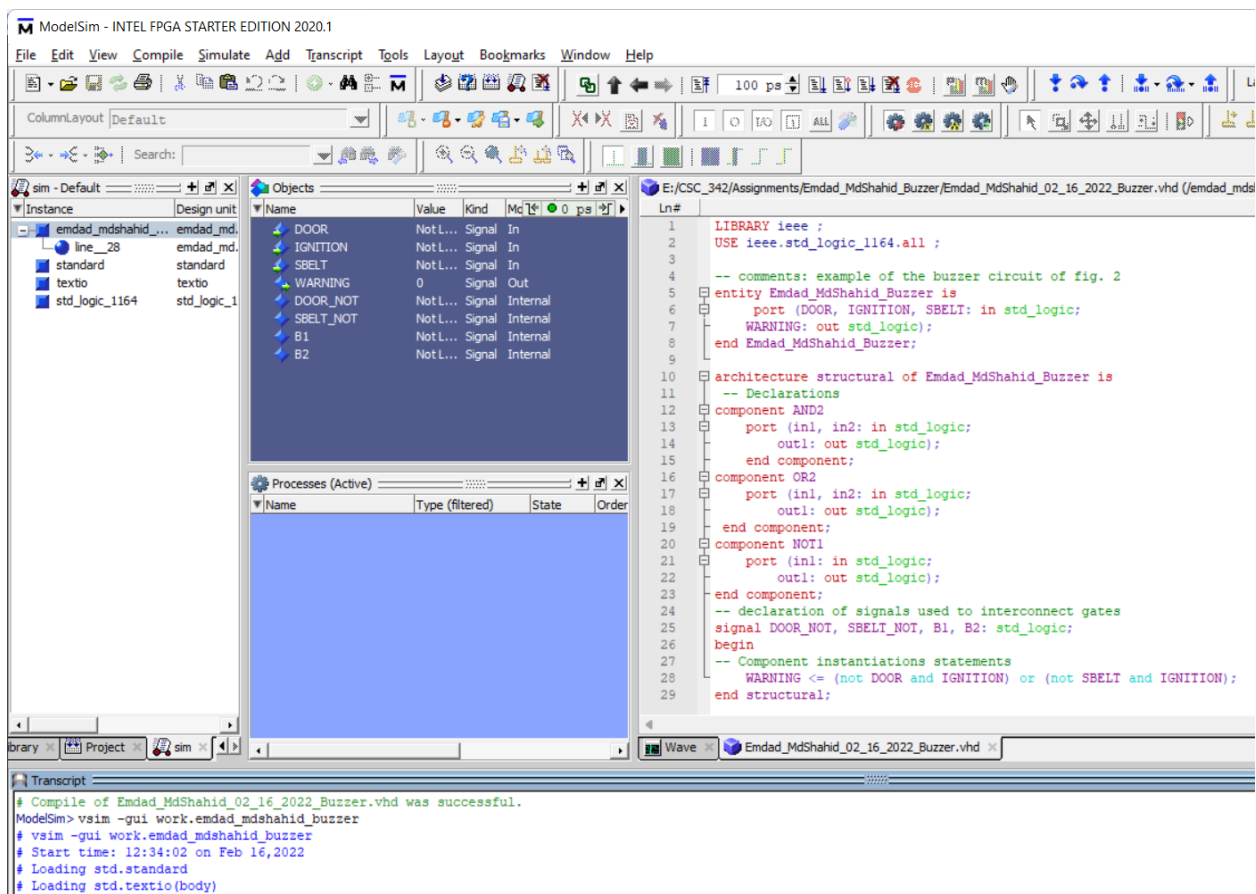


Figure 1: Buzzer vhd file

In figure 2, I created the waveform for the *buzzer.vhd* and we can see the output.

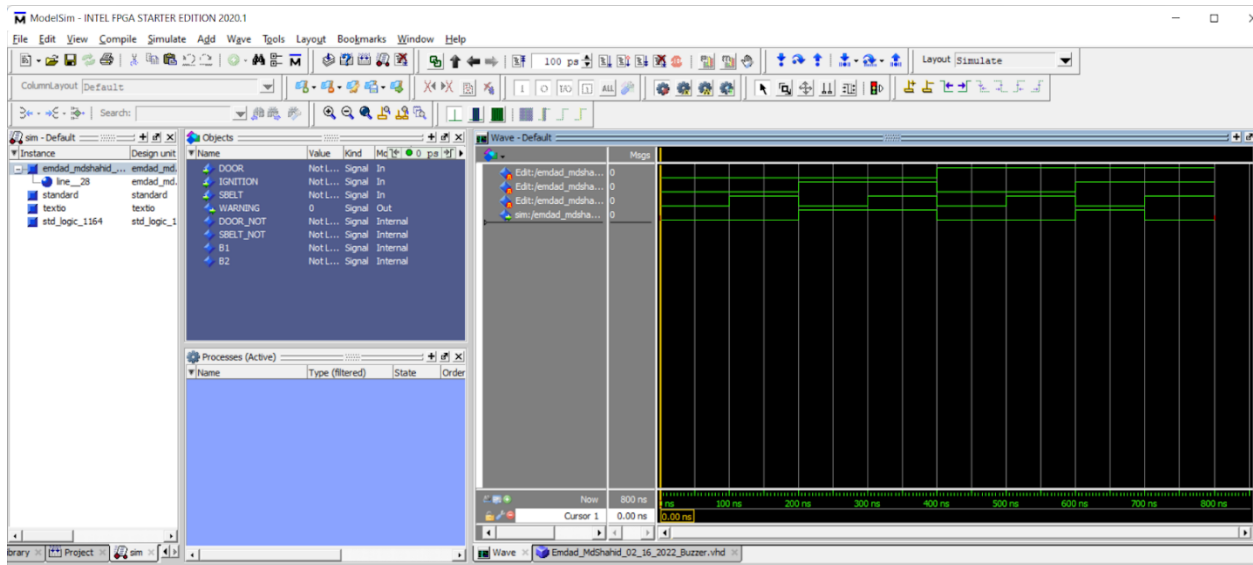


Figure 2: Waveform Output

In figure 3, I did the AND2 component and it compiled successfully.

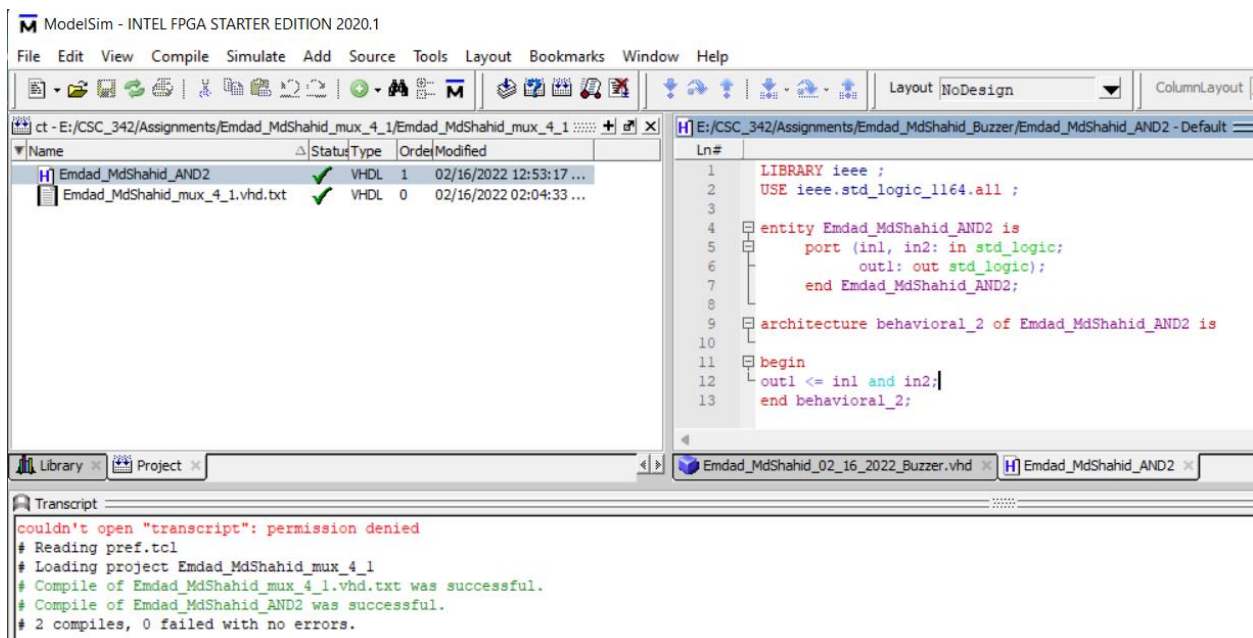


Figure 3: AND2 component

In figure 4, I did the OR2 component and it compiled successfully.

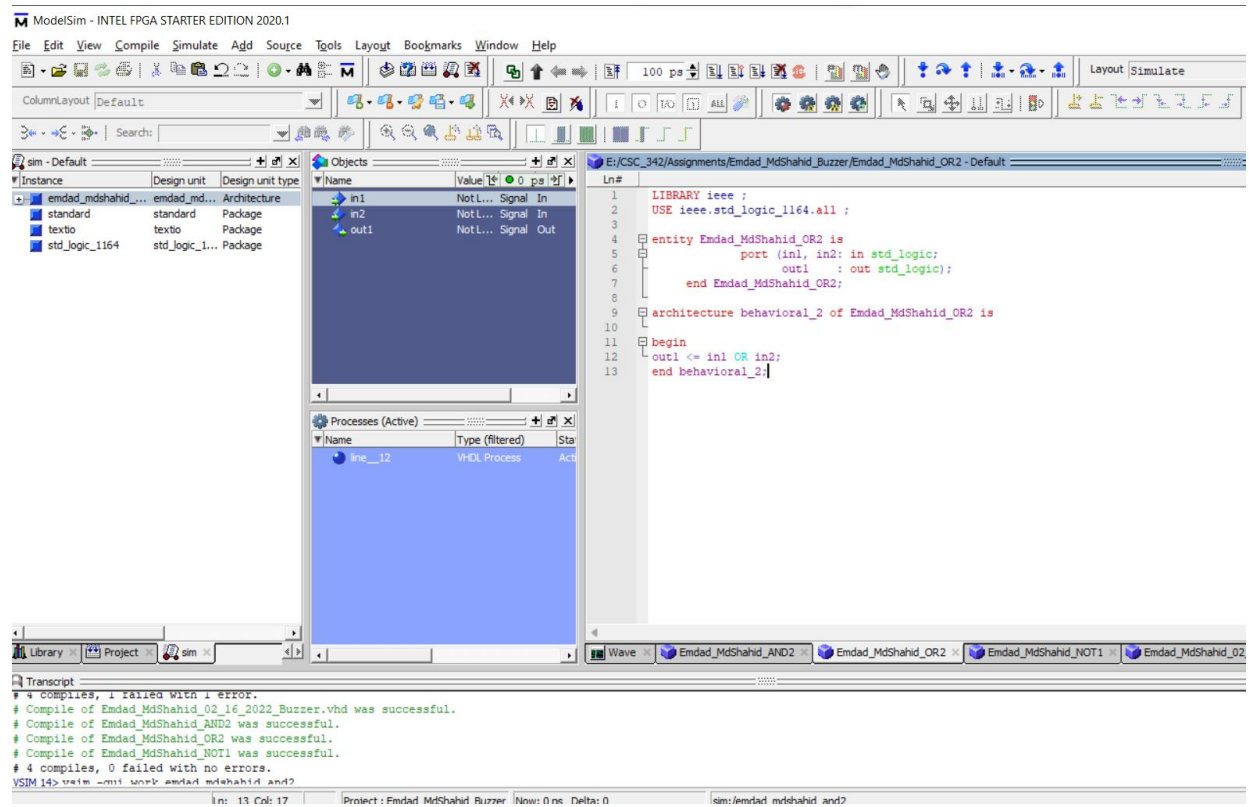


Figure 4: OR2 component

In figure 5, I did the NOT1 component and it compiled successfully.

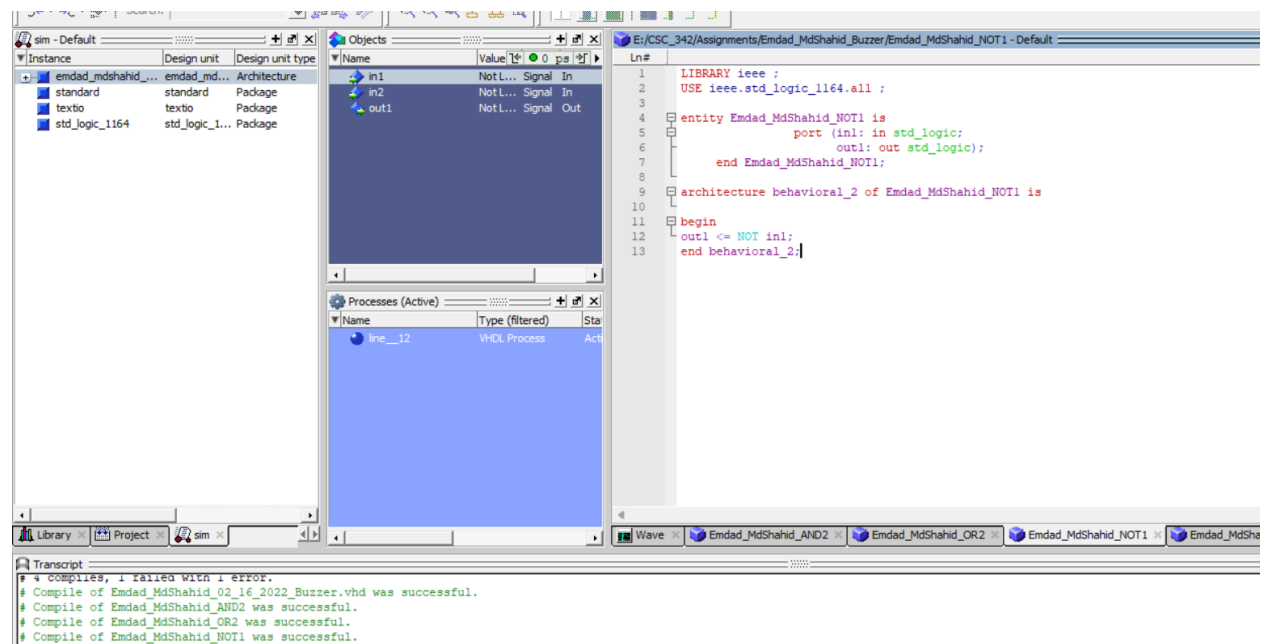


Figure 5: NOT 1 component

II. 4:1 mux 1-bit

In figure 6, I added the existed the file in the new project and then compiled it. As we can, the VHDL compiled successfully.

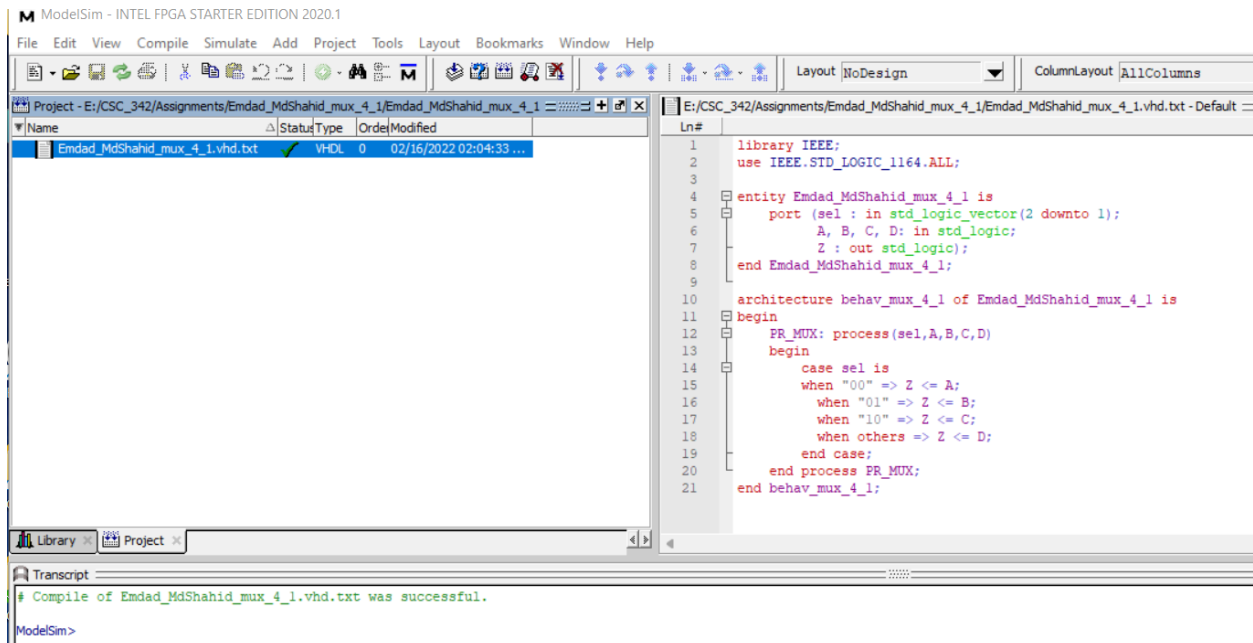


Figure 6: Mux_4_1

In figure 7, we can see the final output of all the waveforms.

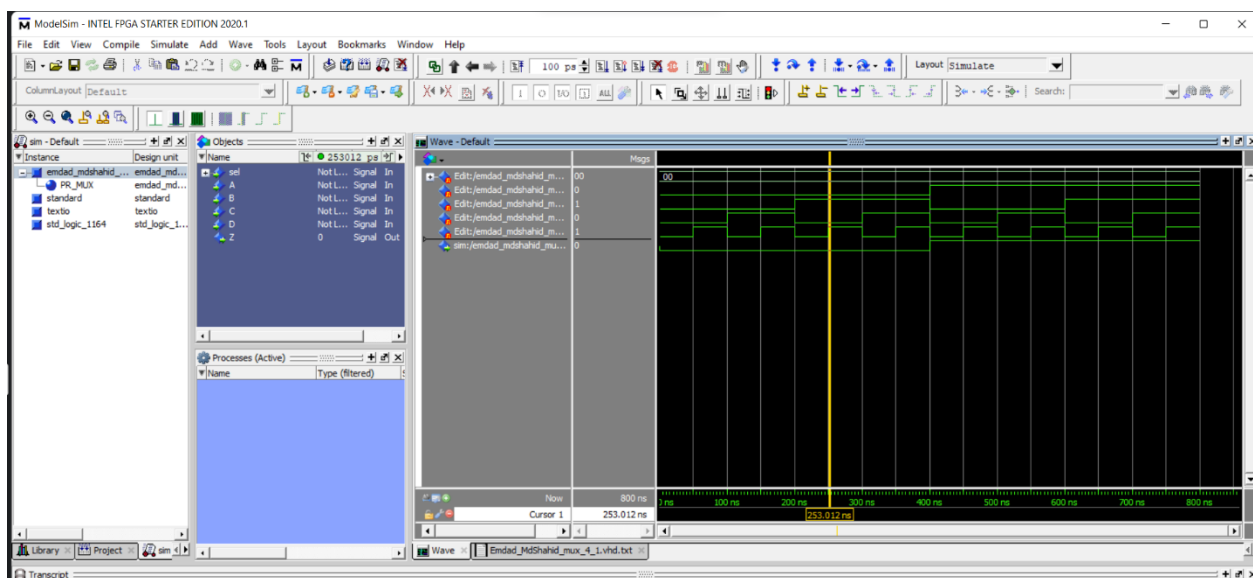


Figure 7: MUX_4_1 simulation waveform

Explanation:

For part A, I used the page code and then compiled them. For the mux_4_1, I did the same thing. I used the boolean expression to check my work. I set the wave and clock pattern and attributes in that way. Then I ran the simulation to see if my output wave matched with the truth table and it did. Hence, the waveforms are right.

Conclusion:

This assignment was helpful to learn modelism and simualtion in Modelism software. It was a thorough and brief practice to learn the software. The operations and condition logics were helpful to learn easily. The truth table helped me to get the circuit waveform quicker. I relearned and reviewed the concept again and which will help me in the course further.