ECE 278 Final Project: Oven Timer Digital Display

By: Ka Chai, Manar Dano, Eric Hoskins, Umair Tahir

Introduction

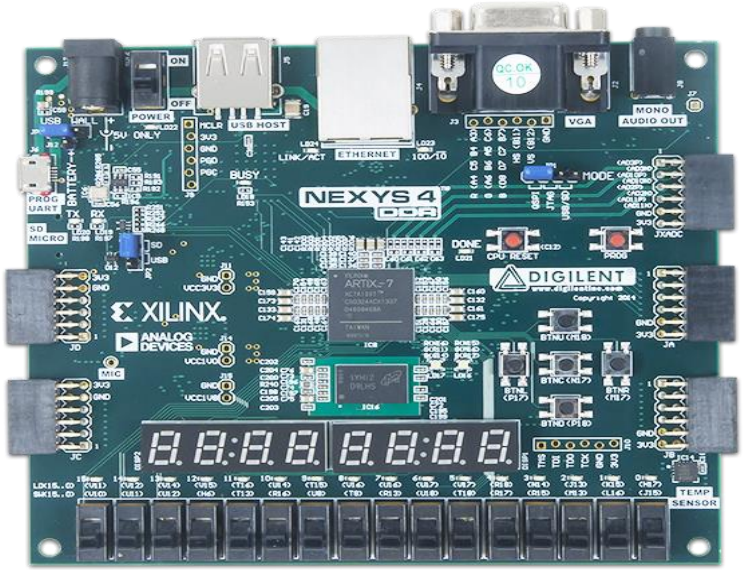
- The purpose of the project is to display the change in time on the Nexys board using clock divider.
- The Nexys Board is the brain of a digital display of an oven timer.
- It will have a look up table, clock divider, multiplexer, seven segment, decoder, timer, and topfile.

Digital Display Functions

- One function is to take a 3-bit input and convert it to a temperature.
- Sent that to a multiplexer, then we created another function takes 2-bit input and an enable.
- The enable starts the countdown, the initial value of the count determined by 2 bit.
- The output will also sent to the multiplexer.
- The last function takes 8, 4-bit inputs.
- Multiplexers based on a clock signal and decodes it to the 7-segment display.

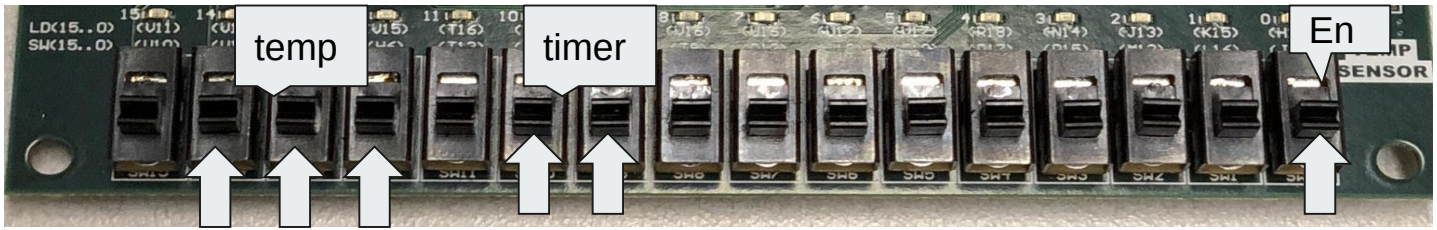
Featured Components

- FPGA (Nexys 4 DDR)
- Button - Clear
- Switches - Inputs
- 7-segment Display - Output

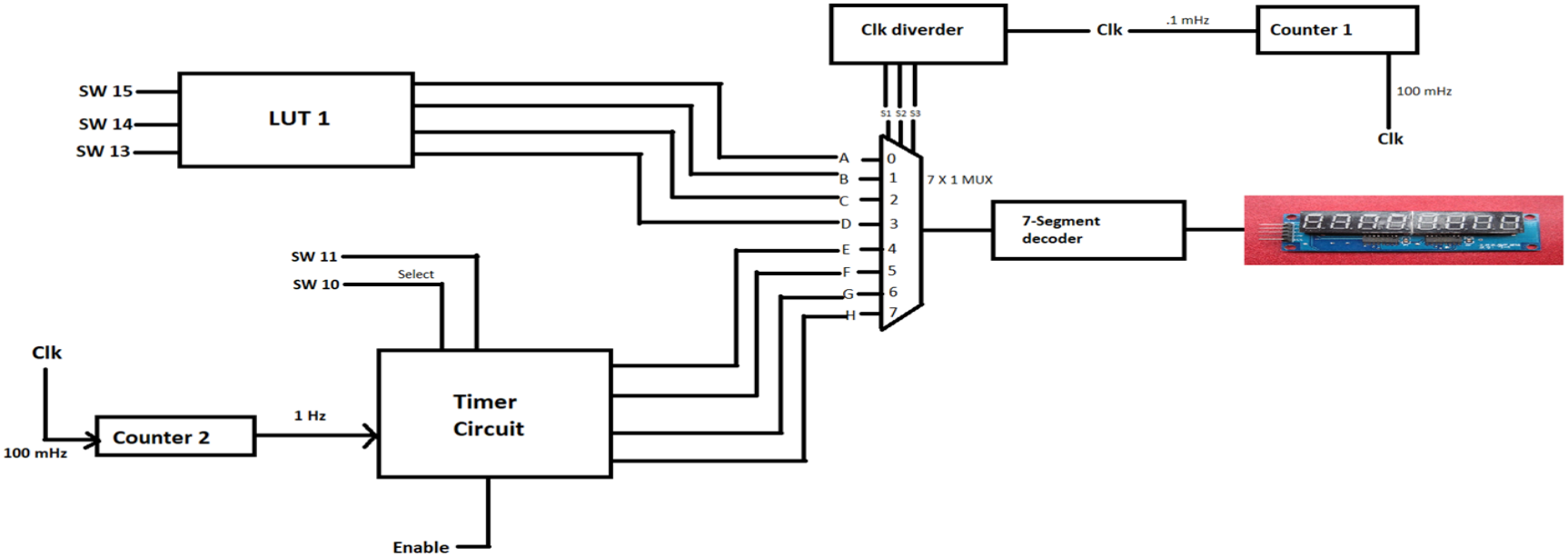


Switches

- Temperature is controlled by Switches 15, 14 and 13.
- Timer is controlled by switches 11 and 10.



Logical Block Diagram for 7-segment Display



Look up Table

- This LUT will take the inputs from the switches and will output the information to 7-Segment Display and the counter respectively.

- The output will be 3, 4-bit numbers for the 7-Segment display.

Table 1

Input			Output		
S2	S1	S0	Temp (C)		
0	0	0	1	0	0
0	0	1	1	2	5
0	1	0	1	5	0
0	1	1	1	7	5
1	0	0	2	0	0
1	0	1	2	2	5
1	1	0	2	5	0
1	1	1	2	7	5

Conclusion & Improvements

- Taking binary inputs and converting it to visual outputs on the 7-Segment Display.
- Also, logically putting the output on another board.
- Improvements
    - Taking inputs off board
    - Attach a heating element and find out the temperature of it

The End.

Thank you!