Project: Count Down Timer

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• Why Timer?
  - The need for Count Down Timer is very essential in our life. We can use it to cook, study, test our self, and has many other use cases.

• Functionalities
  - Set any time from 59 min, 59 sec to 0.
  - Pause the time.
  - Reset time.
  - Led light shows to indicate time has ended.
BCD and Modulo-6 Counters

Modified Counters to
- Load user input
- Decrement their value when enabled
Board Layout
Overcoming Design Drawback

• **Setting timer** → Used Switches
• **Getting the time to countdown**
  • Incorporated load as input to BCD, and modulo-6 counters
  • Redefined our port map properly in order for the timer to countdown to fix warning.
• **Having Time Pause at 00:00**
  → Used K-map to derive Boolean equation that used inputs from BCD and mod-6 counters to disable the generic counter at 00:00
Overcoming Design Drawback: Pausing at 00:00

- **Diagram Description**
  - **Pause**: The pause signal is triggered when the counter reaches 1.
  - **Counter**: The counter is incremented by 1 after each cycle.
  - **Comparison Logic**: The logic checks if the counter value is equal to the pause value.
  - **Decision Flow**:
    - If $NP = 0$, then $E = NP$
    - If $NP = 1$, then $E = Z$
    - Only want enabled if not pause $= 1$ and $Z = 0$
    - $E = NP + Z$
Conclusion

Through the use of VHDL software and DDR4 hardware, we were able to design a Count Down Timer by using a generic counter, 2 BCD counters, 2 modulo-6 counters, and a serializer that had component of another genpause and hex 7 segment display.

We port mapped all of them in our top level file along with using many different signals. Finally, we used constraint file to implement our design.
Thank You

- Time for Demonstration