ECE 278 FINAL PROJECT: ALARM CLOCK

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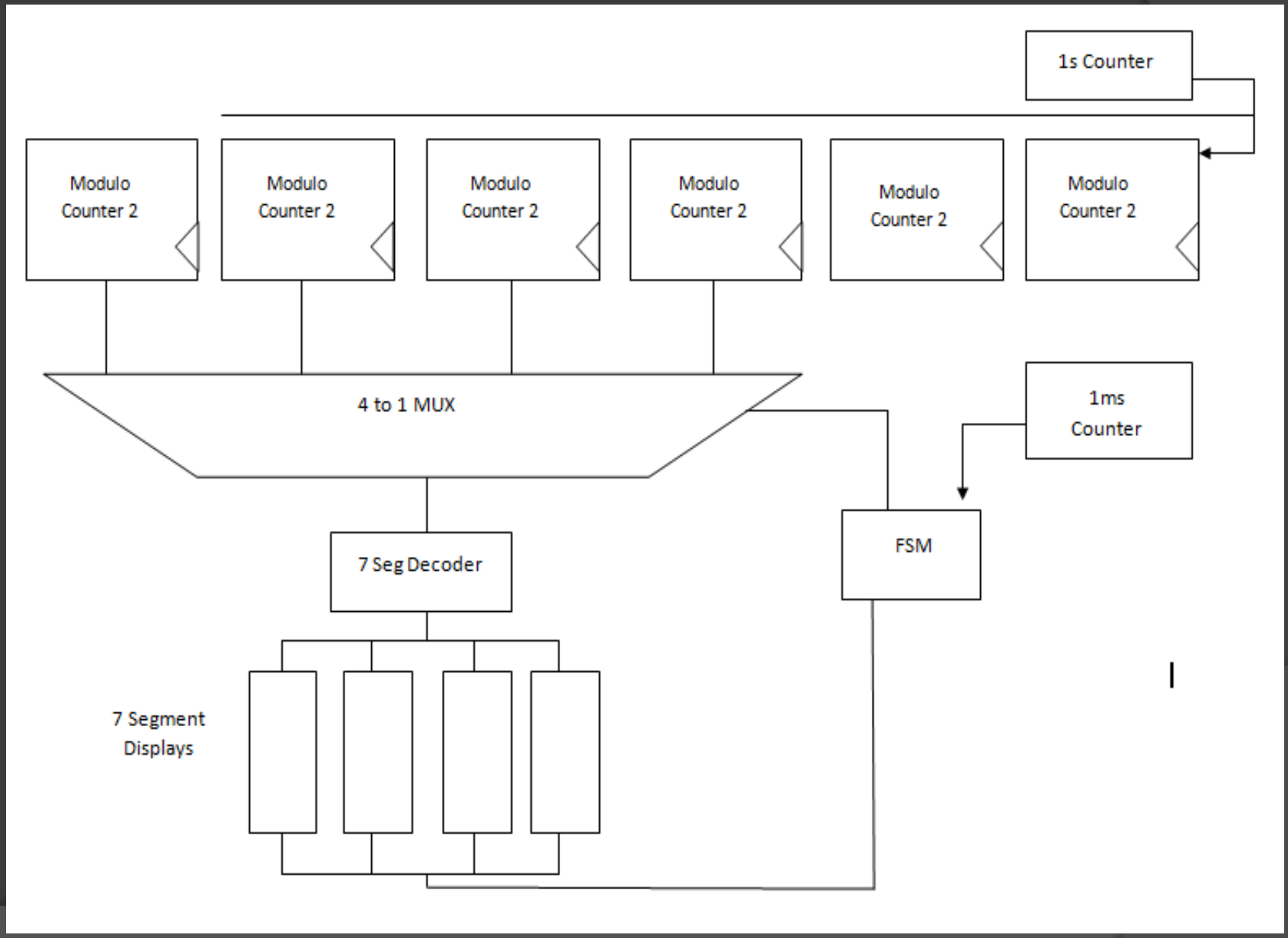
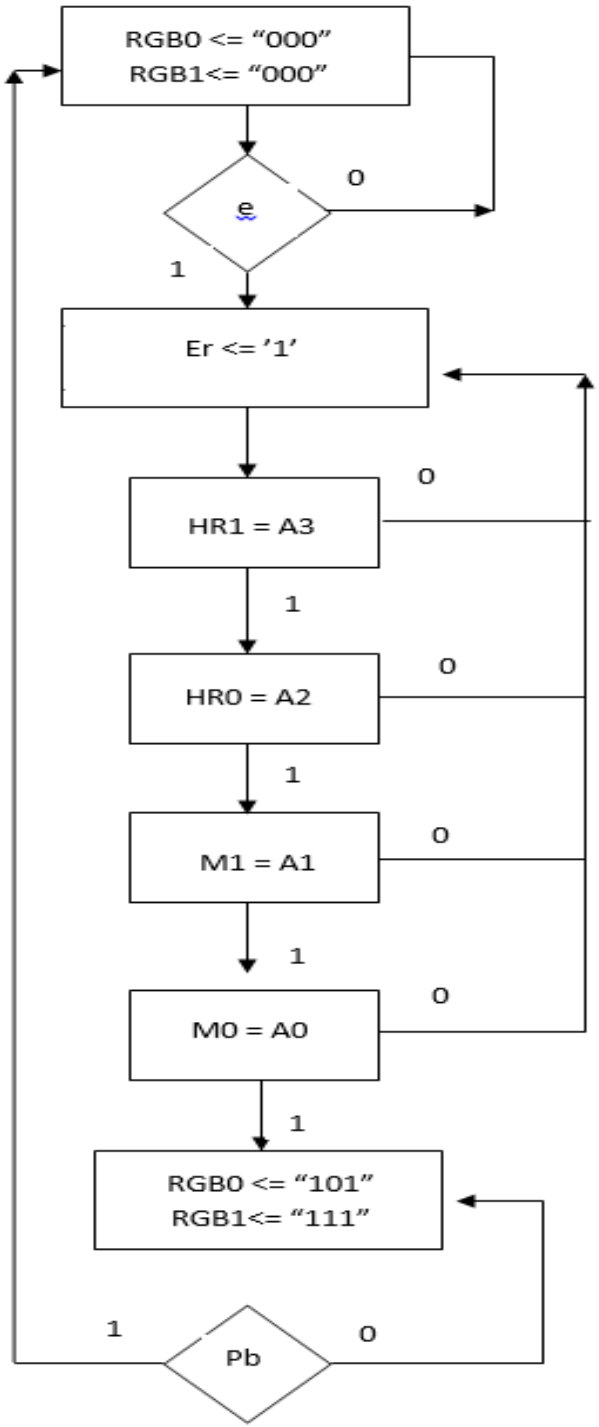
An Alarming Intro

- This alarm clock was designed for a binary understanding user, using the idea of programming in binary is fun (in short spurts).
- The code utilizes 6 counters, 2 finite state machines, a 4 to 1 multiplexor, a 7segment decoder (from BCD), a 2 to 4 decoder, and 4 registers.

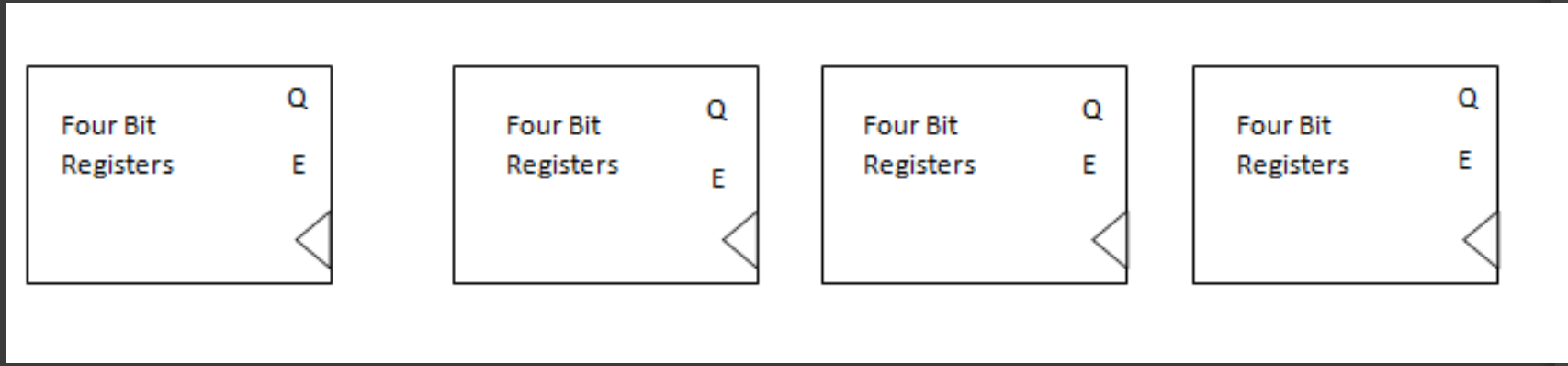
Counters and Displays





←2nd Finite State Machine: Alarm portion of Alarm Clock

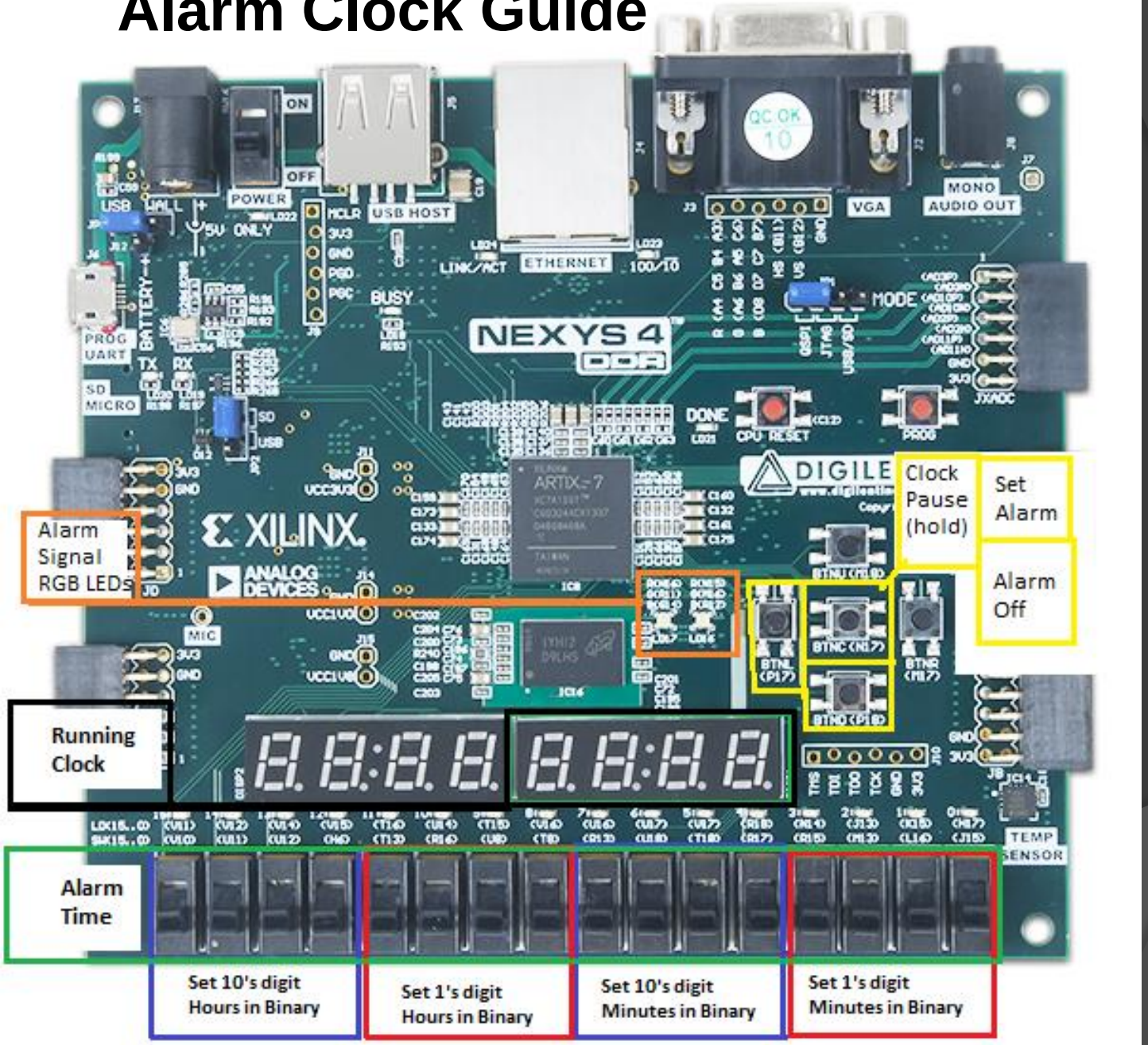
Registers


Four Bit
Registers
Q
E
Four Bit
Registers
Q
E
Four Bit
Registers
Q
E
Four Bit
Registers
Q
E

Board Features

- The XILINX NEXYS 4 board is programmed to use:
  - 7segment display (displays time)
  - RGB LEDs (alarm purple and blue)
  - 16 onboard switches (determines alarm time)
  - 3 pushbuttons
    - Center (sets alarm)
    - Down (turns alarm off)
    - Left (pauses the clock time)

Alarm Clock Guide



How to use the Alarm clock?

- Clock is ongoing, starting at 00:00. It Displays hours and minutes on the 7segment display. To pause the clock, press and hold the left pushbutton, release resumes the time.
- Alarm: set with the 16 switches, code in BCD. The switches select a time. Alarm set (center pushbutton) is pressed to set the alarm time.
- When ongoing clock matches alarm time the alarm (RGB LEDs) turns on. Alarm is set for Purple and White to be displayed. (Red and blue for the first, red green and blue on the second).
- To turn off the alarm, press alarm off button (down pushbutton). RGB LEDs will turn off.