When approaching this project, I was at a loss of words. I wanted to enjoy my thanksgiving break but I knew I was not going to with this project due. Nonetheless, I was able to scrape by and complete it. How I approached this problem was simply playing with a stopwatch over and over. I was focused on all its components. The second I hit the button, what happens, and what changes. Next, I broke down what I was doing into state machines depending on the two buttons. One being the stop/start button and the other being the reset button which goes back to its original position when it first started. Once I knew the inputs, I made a state for each part, depending on where I am, and multiply it by four modes due to the different methods this stopwatch is supposed to implement. Now that I have four choices of modes for the stopwatch and two required switches on my logic board that I must use, it is the perfect time to use a four to two mux. Depending on the switch position, it will select what mode to use. This completes the part on how each mode is selected, now I needed to figure out the actual timing of each second and how to display it on the logic board. Major setback is the fact I had to calculate the clock. In all honesty, I am pretty bad at calculating time when it comes to the clock on logic boards. Once I figured out the timing, it was the part of putting everything together. With all the components such as wires, muxes, states, etc, it was easy to lose track of what you were doing during the writing portion of the code. Also, besides keeping track, the fact that you had to work with the display, the hex to seg seven source code, and the actual incrementing or decrementing of each number. How I thought about it was the fact that there were several hex to seg patterns happening during multiple times and segments, but they do not all move at the same time Each change of number has a small delay that is invisible to the naked eye. This project was difficult nonetheless, and quite honestly, I am happy that it is over. Now I can work on my other codes that I need to work on because I started late!

My system uses a mux with four options and two select switches. Depending on the switch, it chooses a mode, which each one having its own state transitions that is being incremented or decremented by the clock. However, what takes president during these transitions are the stop/start and reset button. All in all, a simple machine that is invented and used on multiple occasions did not expect to take this much work.

