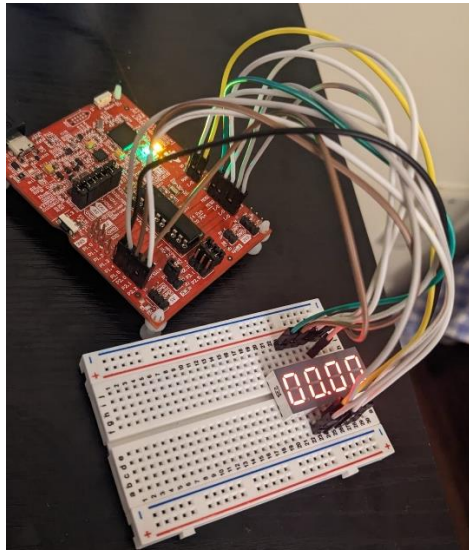


	<b>ECGR 4101/5101 LAB 7 Report</b>	<b>10/19/2023</b>
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#### Lab Objective:

In this lab, we aim to make a stopwatch using an MSP430-ET and a display with four digits and a decimal point. You press a button once to start the timer, again to stop it, and a third time to reset it to "00.00." The stopwatch should measure time in hundredths of a second. We have made use of timers to do this lab.

#### Lab Figures/Tables:



Segment	Port Pin
Decimal Point	Port 2.7
G	Port 2.6
F	Port 2.5
E	Port 2.4
D	Port 2.3
C	Port 2.2
B	Port 2.1
A	Port 2.0

Digit	Port Pin
1	Port 1.7
2	Port 1.6
3	Port 1.5
4	Port 1.4

Mode	Description	Initial State	Transition Condition	Next State
Idle State	Display "00.00" when powered on.	Idle	Button press (1st time)	Running

Running	Stopwatch is running, displays elapsed time in seconds.	Running	Button press (2nd time)	Stopped
Stopped	Stopwatch is stopped, time doesn't change.	Stopped	Button press (3rd time)	Idle

### **Commentary and Conclusion:**

Our project took a total of 5 hours to complete. Initially, we established the necessary hardware connections according to the provided requirements. We then started coding using delays trying to achieve all the specified functionalities, such as starting the timer from "00.00" after it reached "99.99". We also ensured that the decimal point segment on the display was consistently active by subtracting 0x80 when the third digit displayed its value.

After successfully implementing the code, we introduced a timer that triggered 100 times per second. This timer incremented the timer value, which was subsequently shown on the quad display. We had initially used a delay in the quad display function, but this created a flicker issue when placed within the timer that ticked 100 times a second.

To resolve this, we experimented with different values and discovered that setting TACCR0 to 5000 allowed the interrupt to trigger 200 times a second. This increased frequency helped eliminate the display flicker. We also divided the timer value by two before displaying it to ensure smooth operation.