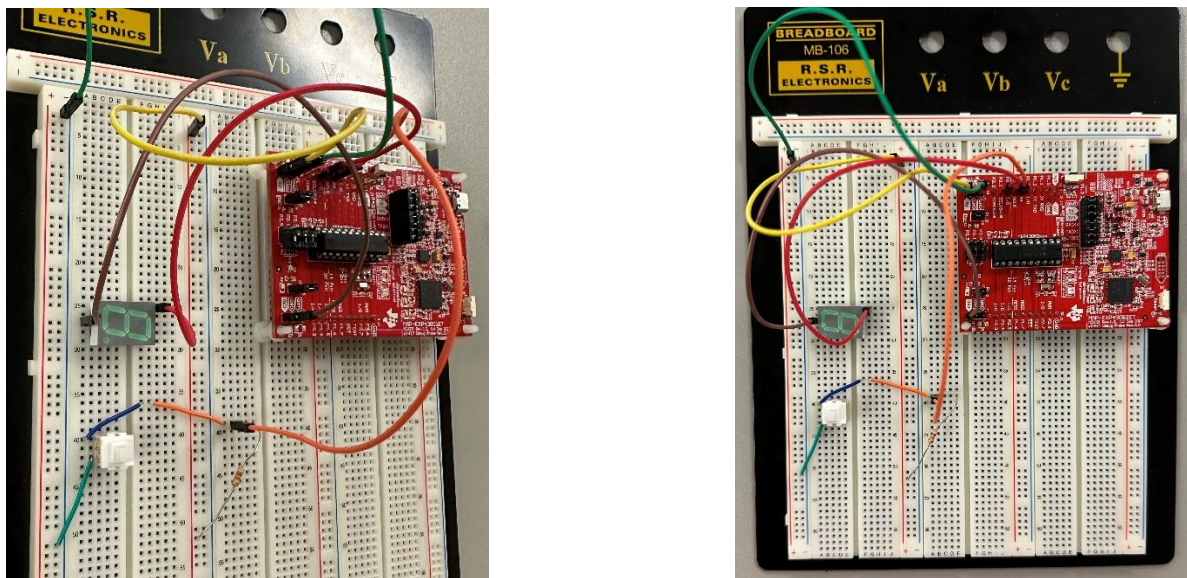


	ECGR 4101/5101 LAB 1 Report	09/05/2023
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### Lab Objective:

The objective of this lab was to further test the basic understanding of Embedded Systems components like 7-Segment LED and Button Switch. The goal was to code as efficiently as possible, keeping only the required lines of code, thus making the program optimized in terms of memory and ultimately making it easier to read and follow through. The lab also tested the knowledge of C Coding mechanics like switch debouncing techniques without the use of Interrupts or timers.

### Lab Figures/Tables:



**Figure 1: Connections made between the Breadboard and MSP430g2553**

### Commentary and Conclusion:

For the majority of the lab, coding and wiring up the components was straightforward. Both the 7-Segment LED and the Button were first tested individually making only the necessary connections. For testing, some basic lines of code were written to check the functionality of the switch with the microcontroller's internal LED. Once that was working, the correct port numbers were entered, and the external Button Switch was wired up.

For the main requirements of the lab, an if statement was used to register the button presses and to keep track of them. For the 3 conditions, a switch statement was used with 3 cases.

A few of the problems that came up along the way included figuring out if the 7-Segment LED was cathode or anode. By logic, a 1 turns the LED ON, but for this LED, a 1 turned it OFF. It took a while to figure this logic out, but once that was figured, the coding became easier. Another

problem that had to be tackled was the switch debouncing issue. To check code's performance, the Debugging option was used. The code was performing exactly as it should, but when the code was run in real time, the cycle of the LED was running out of order. To fix this, delay was added in few places and multiple if, else statements were used for the code to listen to the button press at multiple stages.

In conclusion, the lab went exactly as expected. Initially OFF, on the 1<sup>st</sup> button press, the "g" segment of the 7-Segment LED turned ON. With the 2<sup>nd</sup> button press, it started blinking at 50 % duty cycle, and on the 3<sup>rd</sup> button press, it turned OFF. With the 4<sup>th</sup> button press, the cycle started off again.