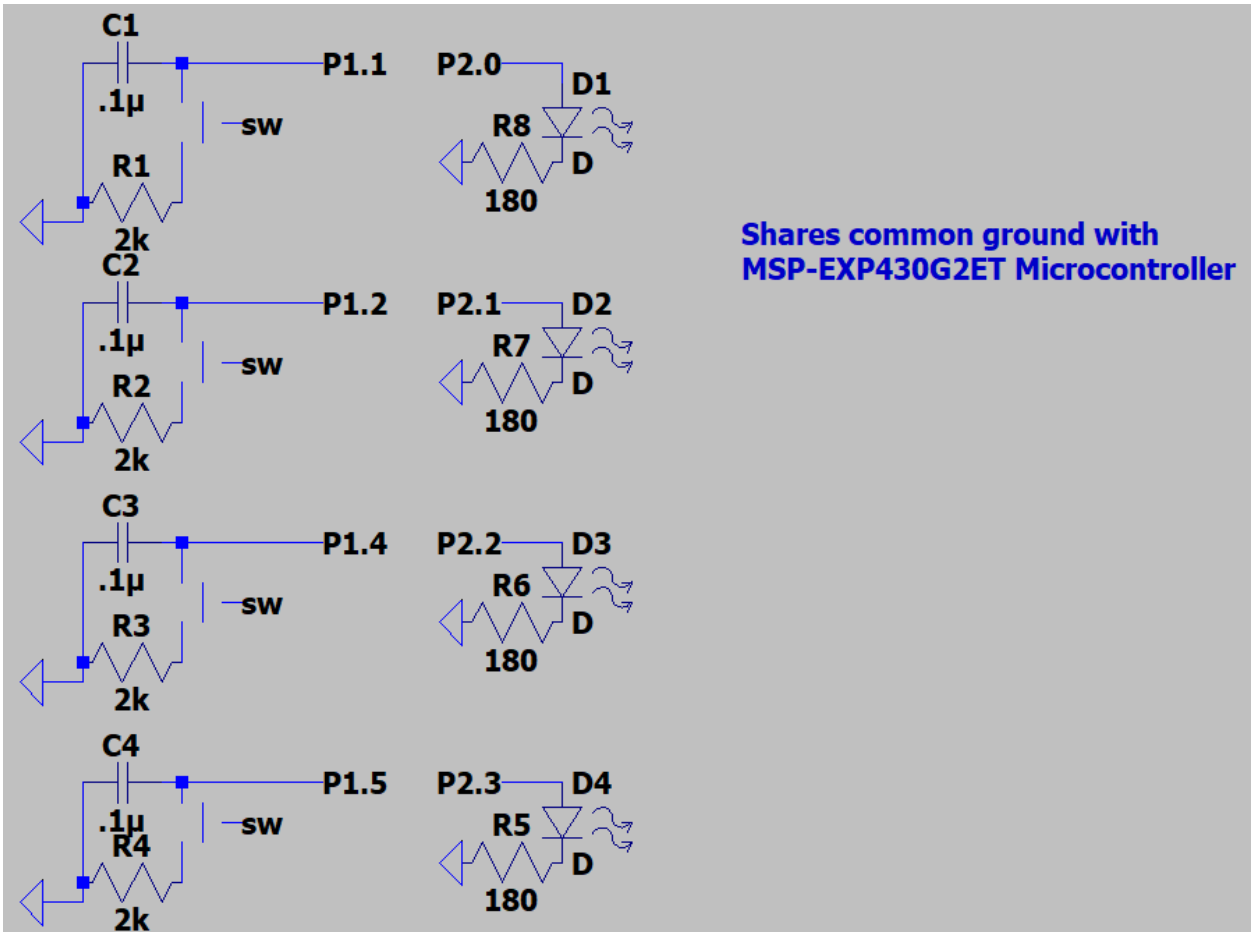
Electronic Simon

Introduction:

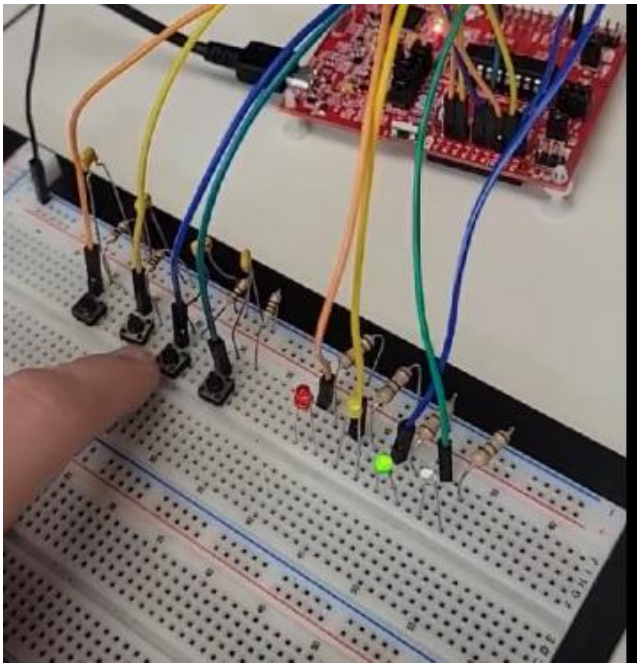
My objective was to create a Pocket Simon game using the MSP-EXP430G2ET microcontroller. This project includes various different topics learned throughout this course such as hardware debouncing, c programming techniques like timers and interrupts.

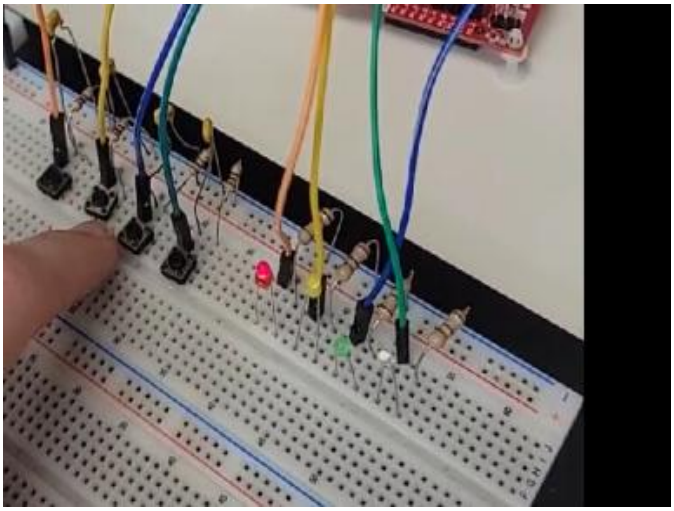
Design:

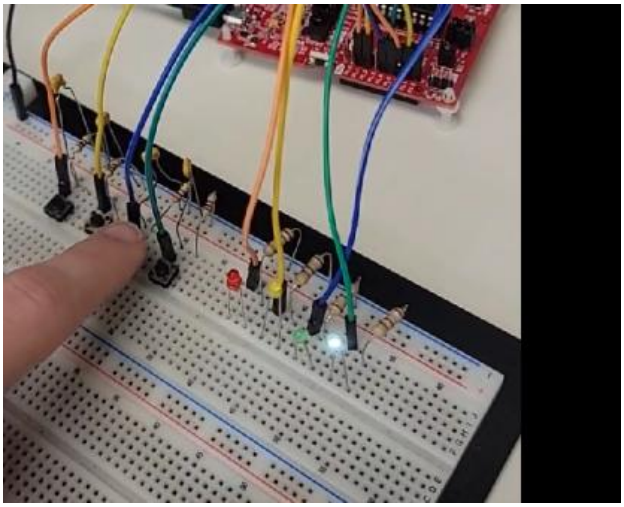
For the hardware side of the game, I used four two pin 6 x 6 mm tactile switches for the user input and for the debouncing of the switches, I used four .1 µF capacitors and four 2000 Ω resistors. Moreover, I used four different colored 3mm LEDs with a maximum current of 20 mA and I calculated at 3.3 volts would need resistors around 165 ohms however, due to resistor tolerance in manufacturing I just went with 180 Ω resistors. As for the buttons, I went with RC filter debouncing because it was easier to do than using the 74LS14 chip.



All of the grounds on the switches and LEDs are being shared with the MSP-EXP430G2ET microcontroller.







Conclusion:

The program works very well and plays the Pocket Simon game perfectly, I managed to even add celebratory flashing if the user manages to finish the game in the proper sequence. However, that isn't to say there weren't any issues along the way. Trying to find a way to actually implement this "memory game" was a lot harder to do in practice. Setting up the button interrupts was very simple and straightforward, I managed to turn the LEDs on to the corresponding buttons pretty quickly, but trying to get the timing setup took way longer than I had hoped for. Trying to make the game reset if the user doesn't make an input was a lot more confusing and way more difficult but in the end with some help I managed to get it implemented, and now the code works perfectly.

Appendix:

See attached file for the code.