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Final Project Write-up
CPET-253 – Microcontroller Systems
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GitHub Project Repo - <https://bit.ly/37mL1wi>

Project Description

My project was to program my microcontroller to incorporate the following: hardware Interrupts via the bump sensors, Ports, SPI-LCD, Bluetooth, Timers, and state machines. My end goal was to control the robot via Bluetooth and have it so that when it bumps into things it can move away from the objects it bumped into and get into a safe location. After which I would be able to resume control of the robot. For a little humor I decided to print to the LCD things like “OUCH!” and “ZOOOM!!” when it bumps into things and is driving forward.

Project Conceptualization

I came up with the idea for the project after our Bluetooth and LCD lab and wanted to essentially make an R/C robot that has basic obstacle navigation.

Obstacles Faced

While writing the code and testing, it took me a while to get the state machine for the bump interrupts to play nicely with the Bluetooth control. I had initially created an external file for the state machine, but I realized the code was getting stuck in the while loop of that file and not reading the Bluetooth inputs. Once I changed it so have the state machine in the main function it worked with minor bugs that I had to troubleshoot. Those bugs mainly being calibrating delays. \

Testing and Verification

During testing is how I figured out about the code getting stuck in the while loop. Once that was fixed it was down to adjusting the delays for the turning to be exactly what I wanted.

