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CSE 3440

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Embedded Project

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Introduction:

The project is based off of the TI Tiva C series board and the project acts as an IR receiver and transmitter. The functionality of the project is to be able to store commands from different remotes and be able to emulate those commands out of the IR transmitter.

Theory of Operation:

The idea is to build off of my previous lab code. I built the hardware to transmit and receiver IR signals and used lab 6 code to decode the signals.

Code:

The code is built off of lab 6 code which decodes IR signals. Lab 7 code I used to modulate PWM signal and reverse the process of what lab 6 code does. Lab 8 code is just using the PWM module to modulate a signal to control the speaker on and off signal. This code also contains the ability to modify the frequency and duration of the speaker tones. Lab 9 added the ability to play specific sounds to signify a correct or incorrect signal. Lab 9 also is supposed to support writing and reading from the eeprom to store commands and to be able to use these commands to output an emulated signal from the lab 8 IR LED transmitter hardware. However, I ran into difficulty with my remote from lab 6 on numerous occasion which set me back. I was able to reprogram another remote I bought off of amazon and able to finally start on the groundwork for lab 9. I began by writing the code for decoding the remote signals and using lab 6 to display the data and address values of the signals received. I also began writing the alert portion of the code as I was doing this. I then started on the learn portion of the code which attempts to store a learn command during the interrupt process after the learn command is enabled. I did not get to the reading portion of the eeprom, so I never got a chance to check if this stored valid information in the eeprom.

Conclusion:

I was only able to get to parts 1, 2, 7, and 8 due to being stuck on previous labs for so long. I did however learn quite a lot of information about embedded systems by working on these projects and learned how to use the crucial components such as timers, PWM's, analog to digital converters, Uarts, and Serial devices.