

CPE 325: Intro to Embedded Computer System

Lab07

LEDs with PWM and Timers.

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Report Deadline: 03/02/22

Demonstration Deadline: 03/08/22

Introduction

The purpose of this lab was to understand how the LEDs on the MSP430 can be driven using timers and use pulse width module control to generate sound on the buzzer. The source codes are not included with this report, I requested to demo them instead so I can have some more time to rectify and test my code.

Theory

Write short notes on each topic discussed in lab.

Topic 1: WATCHDOG TIMER:

The Watchdog Timer (WDT) is built into a system to signal defective software events during normal operations and perform a controlled system restart. The watchdog timer counter (WDTCNT) is a 16-bit up-counter but it is not directly accessible by software. Watchdog timers can also be used to blink LEDs through Interrupt Service Routines.

Topic 2: TIMERS:

Timers are peripheral devices that count, i.e increment or decrement their values at specific clock frequencies. Embedded systems like the MSP430 microcontroller is equipped with at least one timer device. Timers are initialized by setting the the control registers, where we specify the operating mode clock frequency and define whether an interrupt will be raised when the counter reaches zero. Timers can also be used to capture the current value of the counter when events occur during normal operation.

Results & Observation

Program 1:

Program Description:

Submitted request via email to send in programs after completing my lab demo, so I could get more testing time, since we must go to the lab to do the tests.

Conclusion

This was an opportunity to learn more about pulse width module and timers and will spend more time familiarizing myself with them and the MSP430.

