EELE 465 Project 1

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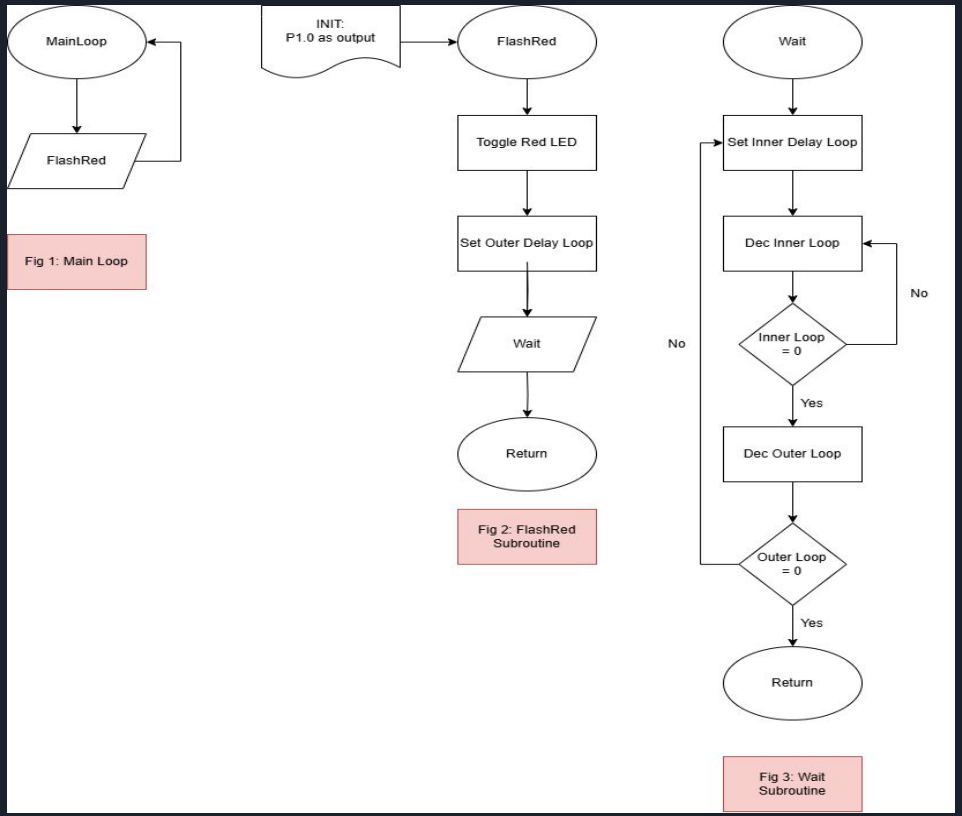
Project Introduction

This project had two main objectives that had to be completed:

1. Create a program that flashes LED1 on the MSP430 microcontroller at 0.5Hz using delay loops
2. Create a program that flashes LED2 on the MSP430 microcontroller at 0.5Hz using a timer and interrupts

The point of this project is to verify the proper operation of the MSP430 and to compare/contrast two different methods of achieving the same goal. This helps us practice approaching a problem in multiple ways and think of the pros and cons associated with a given method.

Delay Loop Implementation Flow Chart



Getting an Accurate Time

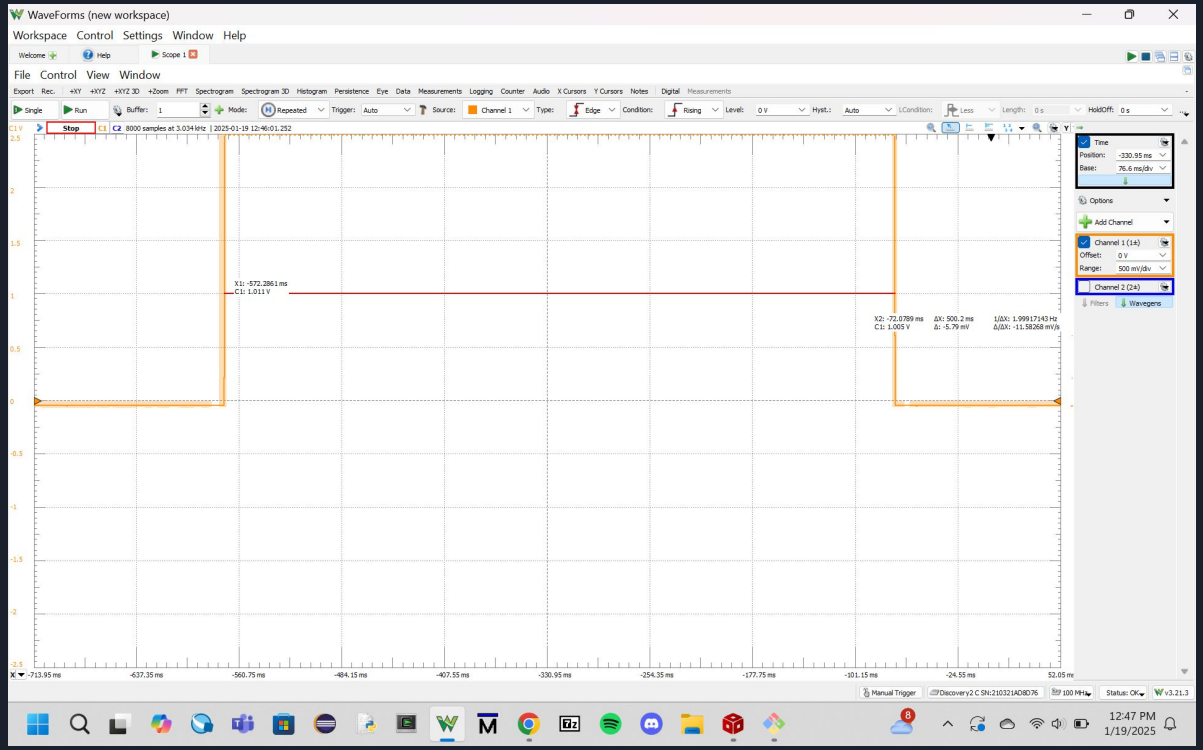
- We started by guessing and checking to get relatively close to the correct time.

- Then, we looked in the MSP430 documentation for clock cycle timings for the instructions present in the program, using those to hone in on the correct frequency.

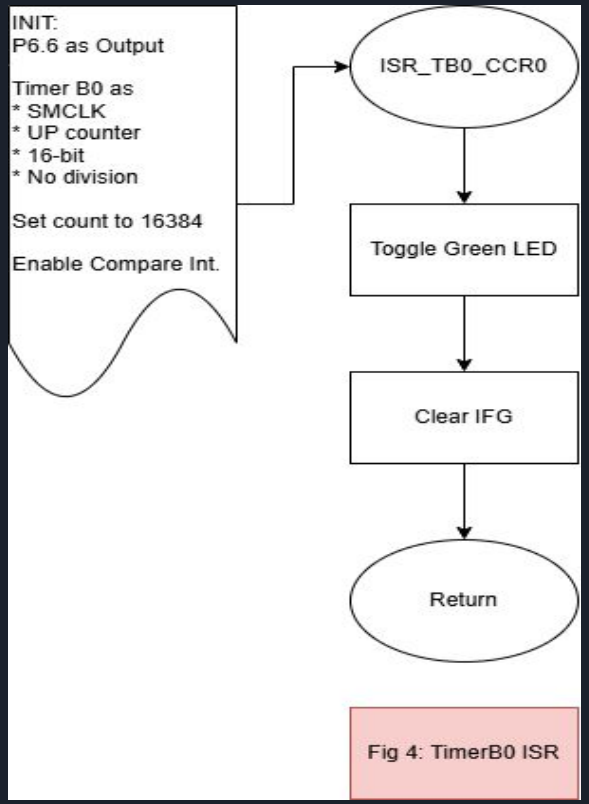
Timing of Flashing LED 1

The measurement is small but it reads 500.2ms.

The reason for the slight disparity is because we had to manually drag the measurement tool.



Timer/Interrupt Implementation Flow Chart



Getting an Accurate Time

- Our starting and ending values were the same, as I calculated the number of clock cycles needed before entering it.

- We used timer B0 on the ACLK, which has a frequency of 32.768kHz. The period of this clock, therefore, is ~30.52us.

- Since we're aiming for a frequency of 2Hz (0.5s period), this takes about 16,384 clock cycles, which is the value I placed into the CCR0 register.

Timing of Flashing LED 2

The measurement is small but it reads 499.7ms.

The reason for the slight disparity is because we had to manually drag the measurement tool.