EE2361 - Lab 1

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Abstract

The purpose of this lab was to give us the basic practice on how to program the assembly codes into a microcontroller chip PIC18F4550 and get us familiar with the properties of some pins on the chip such as RC0 and RC7. Also, in this lab, we were taught on how the programmed chip can wire up with circuit and gave us visible result for us to observe on the timing behavior.

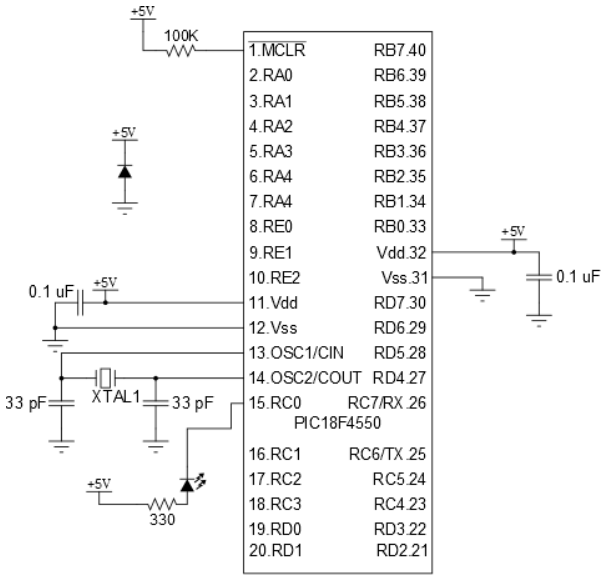
Introduction

This objective of this lab was to take the provided code, which blinks an LED, and flash it to the PIC18F4550. Then properly wire it up so that we could time the period of the blinks to see how accurate our timing crystal was and to see what frequency the processor would run at with no crystal attached.

Parts

- 1x - PIC18F4550
- 2x - 0.1 uF Cap
- 1x - 8 MHz Crystal
- 2x - 33 pF Cap
- 1x - Protection Diode
- 1x - LED
- 1x - 330 Resistor
- 1x - 100k Resistor

Schematic



Lab Codes

Results

Based on a simulator stopwatch timing the LCB of PORTC will toggle every 4206646 instruction cycles. With an average time between toggling found to be 0.34 seconds, the actual instruction frequency was 12.3395 MHz. This is a 2.83% error from the intended 12MHz instruction frequency.

With the crystal removed we found the time between toggling to be 16.8 seconds, therefore without a crystal the instruction frequency would be approximately 250 kHz.

Conclusion

During this lab we successfully programmed and wired up the appropriate circuit and were able to calculate the instruction frequency from the blinks of the LED.

Three of the bits on PORTC refused to be set in the simulator, this appeared to be true in real hardware as well. From what I can read from the data sheet RC3 is not implemented and RC4 and RC5 are shared with the USB module. The USB module must have been enabled and I’m not sure how to disable it to get the pins back for general usage.