
ECE 346 – Microcontrollers

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Assignment #1

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Introduction

In this lab we were to create a program that reads in a 32 bit number. It would read from the 4 dip switches as bits. This in turn would be repeated 8 times until a word has been made. This would be stored into r3 as mynum. After that was complete the software would compute the number of ones and display it to the leds.

Background

This assignment used our knowledge of assembly that would be able to use variables and different operations from the Nios II processor reference handbook.

Preliminary

To start of the work looking at the initial assignment and developing an understanding for what the program needed to do and what to go about. This is what I had written down to get started.

dip switch → button press → stores into r3

dip switch → stores into a temp register → the temp space OR's with my num

This repeats 8 times to make the 32 bit half word

on it reaches 8 times it sends the number of ones to less → this waits for push button three times

I had planned out which registers stores what value for the program. Below is the diagram for the registers.

r3	MyNum
r4	LED
r5	DIP
r6	BUTT
r7	Not Used
r8	Not Used
r9	WaitLoop Value
r10	Temp
r11	PushButton Wait
r12	Check the number of Loops
r13	PushWait final
r14	Not Used
r15	Not Used
r16	Not Used
r17	Not Used
r18	Not Used
r19	Not Used
r20	Not Used
r21	Not Used
r22	Not Used
r23	Not Used

Design

Attached is the code that was made and the flowchart of what was done. The code is labeled as SciortinoDanielLab2.s and the flowchart is labeled SciortinoDanielLab2Flowchart.pdf

Results

I was able to get the the dip switches to write to the temp space of r10 this then would be or'ed with r3. r3 would then be rotated logical left by 4 bits with zeros. this then would be used for the next reading. I wasn't able to test the if the program would be display the correct Number of 1's on the LEDS.

Conclusion

I am not sure the level of completeness with the code. But I was able to get the the dip switches. I wasn't able to get the one counter working correct. I was able to make progress. This with learning the difference between ldwio and stwio helped make this code work better and make more progress.

Learning Outcome

The roli operand is helpful when completing this assignment.