ECE 3301L CAL POLY POMONA

ECE Department

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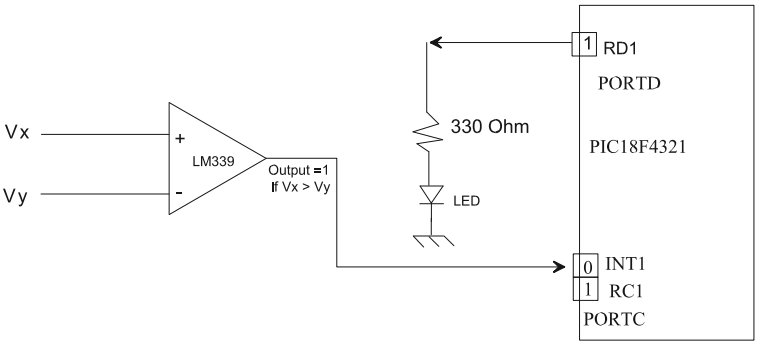
LAB # 8

PIC18F INTERRUPT I/O USING ASSEMBLY AND C

1. Title: PIC18F4321 Interrupt I/O using PIC18F assembly and C

2. Objective: The purpose of this lab is to illustrate the concept of PIC18F4321 interrupt I/O.

3. Prelab:



(a) Repeat LAB 7 using Interrupt I/O by connecting the comparator output to INT1. Note that RB1 is also multiplexed with INT1. Write the main program at 0x80 and the interrupt service routine at ~~0x150~~ in PIC18F assembly language. The main program will configure the I/O

ports, enable interrupt INT1, initialize STKPTR to 0x10, turn the LED OFF, and then wait for interrupt. The interrupt service routine will turn the LED ON and return to the main program at the appropriate location so that the LED is turned ON continuously until the next interrupt.

(b) Repeat (a) using C except initialization of STKPTR is not requiered and also starting addresses for the main and the service routine do not need to be assigned. As shown in the above figure , the PIC18F4321 is required to turn on an LED connected to bit 1 of PORTD if the comparator voltage Vx > Vy; otherwise, the LED will be turned off.

4. Equipment, Software, and Components required:
-Microchip's MPLAB assembler/debugger and C compiler
-Parts' List
a) PicKit3 and PIC18F4321 from Microchip
b) Breadboard
c) Resistor (330 ohm) and LED
d) Resistors (1K and 10K), and Push button for RESET circuit
e) LM339 Comparator
f) Power Supply
g) Wires and Clip leads

5. Description (corresponding topics covered in the textbook):
Example 9.2, Appendix F, Appendix G, Appendix H
6. Prerequisites:
Sections 9.2
7. Procedure:

-Assemble the PIC18F assembly language program and compile the C-program using the MPLAB.

-Download the assembled or the compiled program into the PIC18F4321 on the breadboard from your Personal Computer or

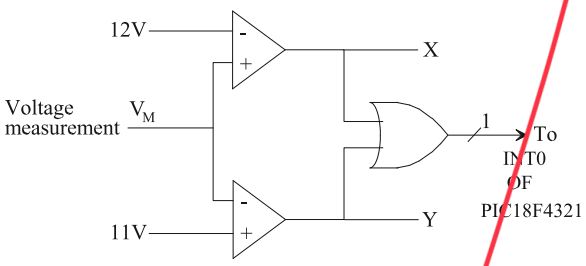
Laptop using the PICKit3™ and MPLAB following the steps provided in Appendix H of the book.

-Use the default clock of the PIC18F4321 and connect the appropriate RESET circuit to the PIC18F4321 $\overline{\text{MCLR}}$ pin.

-Connect the hardware and demonstrate the lab as a PIC18F4321-based stand-alone system.

8. Deliverables:

Postlab:



In the above figure, if VM > 12 V, turn an LED ON connected at bit 3 of PORTA. If VM < 11 V, turn the LED OFF. Using ports, registers, and memory locations as needed and INT0 interrupt:

(a) Draw a neat block diagram showing the PIC18F4321 microcontroller and the connections to ports in the diagram shown in Figure P9.11.

(b) Write the main program at 0x150 and the service routine at 0x200 in PIC18F assembly language. The main program will initialize the ports and wait for an interrupt. The service routine will accomplish the task and stop.

(c) Repeat (b) using C-language. Note that starting addresses for the main program and the service routine as in the assembly language are not needed.

Lab report:

-Submit a lab report (Stapled signed prelab, typed postlab) at the end of the quarter or semester.

9. Concluding remarks:

-Complete the prelab before coming to the lab, and get it signed by the instructor.