

LABORATORY SESSIONS

LAB. 1: BLINKING LED AND COUNTER

I) Blinking LED

Write a software program in a language of your choice (MikroC, Assembly, CCS etc...) that blinks an LED connected on pin RB7 of a PIC16F84A at a frequency of 1 Hz.

- Achieve this using a delay loop of iteration.
- Use the in-built delay subroutine in MikroC
- Simulate the program using the circuit shown in figure 1 below via Proteus software. Verify that the program functions properly when simulated.
- Build the circuit on breadboard using a PIC16F84A on which you have burned the hex file of the program tested in c) and observe the operation. Demonstrate the circuits operation to the lab. Instructor.

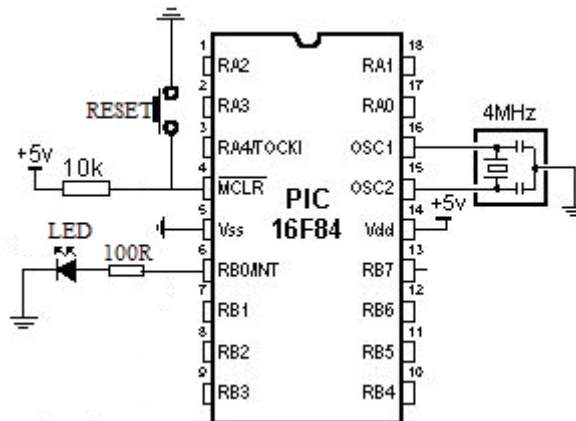


Figure 1 – LED blinking Diagram

- Add a push button on pin RB7 as shown in figure 2. The LED should blink with the same frequency as above each time the button on RB7 is pressed and held.

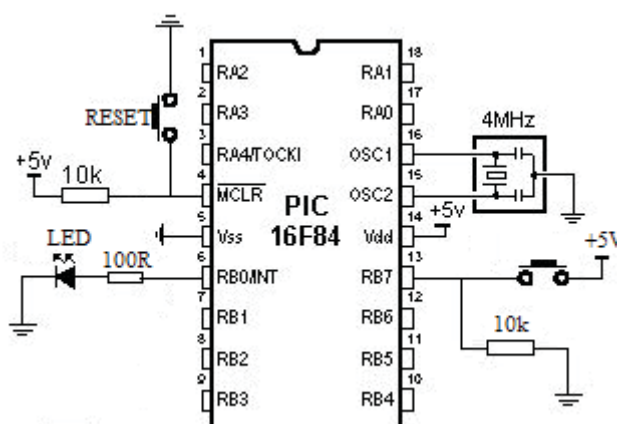


Figure 2- LED blinking with push button

Present the results in I) (a – e) in a Lab Report. Attach your source code as appendix.

II) Counter

- Modify your program in I) above, to count sequentially from 0 – 7 (using 3 bits, represented by 3 LEDs) in binary by adding two other LEDs connected to RB1 and RB2 respectively. Assume that an LED on represents a 1-bit and an LED off represents a 0-bit. E.g. “off”-“off”-“off” represents the number 000, while “on”-“on”-“on” represents the number 111 (corresponding to 7 in decimal). Use the in-built delay subroutine with a frequency of 1 Hz.
- Simulate the program using your modified circuit using the Proteus software.
- Burn your hex file onto a PIC16F84A and use it to build the circuit on the breadboard and observe the operation. Demonstrate the circuits operation to the instructor.
- Connect a push button on RA0 as shown in figure 3. Modify your counter to **count down** when this button is **pressed and held**, and **counts up released**

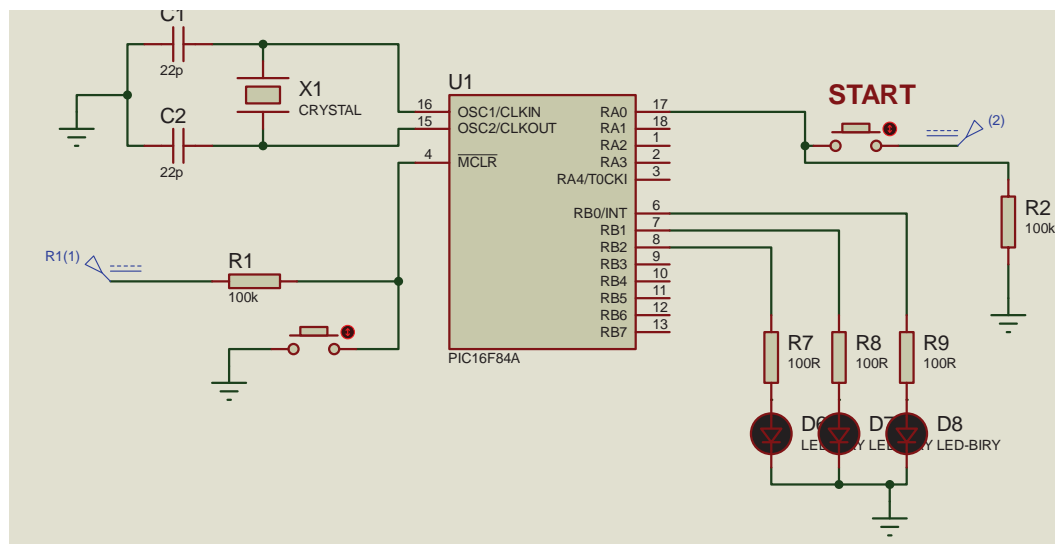


Figure 3- Counter with push button

- Present the results in II) (a – d) in a Lab Report. Attach your source code as appendix.