



PICs – LAB 4

INTERRUPTS

Basic exercises

- ❑ **Exercise 4.1.** Write a program that shows the value of variable *CICLO_20ms* in 8 LEDs connected to PORTC. Variable *CICLO_20ms* must increase its value every 20 ms. Use Timer 0 overflow interrupt. Use *StopWatch* to verify its behavior by means of simulation.
- ❑ **Exercise 4.2.** Write a program that implements a ten seconds countdown from 9 to 0 and show it in a 7-segment display connected to port PORTC. Before starting and once the countdown has finished, the display must be off. The countdown will start when a button connected to RB0 is pushed. Use Timer 0 overflow and RB0/INT interrupts. Use Indirect Addressing to associate each number with its 7-segment code. Use *StopWatch* and *Stimulus Workbook* to verify behavior by means of simulation.
- ❑ **Exercise 4.3.** Complete the program of exercise 4.2 to add the functionality of pausing/restarting the countdown by releasing a push button connected to pin RB7, and of resetting and switching off the display by pushing a button connected to pin RB6. Use RB port change interrupt on RB[7:4] pins to detect the activation of the desired edges. Use *StopWatch* and *Stimulus Workbook* to verify behavior by means of simulation.