Badji Moktar ANNABA university
Faculty of technology
Electronics departement
Microcontrollers and Microprocessors course

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TD7: Microcontroller PIC16F84 « DELAY+ Interruption »

- **Ex1 :**

➢ Configure pins **RB0, RB3, RB6, RB7** of **PORTB** as inputs, and pins **RB1, RB2, RB4, RB5** as outputs.

➢ Configure pins **RA0, RA1, RA2** of **PORTA** as inputs and pins **RA3, RA4** of **PORTA** as outputs.

- **EX2**

➢ Write a program that allows turning a LED on and off using two push buttons.

➢ Write a program that allows turning **8 LEDs** on using two push buttons **BP0** and **BP1**:
➢ Pressing push button **BP1** turns **all LEDs ON**.
➢ Pressing push button **BP0** turns **all LEDs OFF**
Assume that the LEDs are **off when idle (not in use)**.

- **Ex3 Simple delay**

➢ Write a program that makes a set of **8 LEDs** connected to **PORTB** blink.

➢ Write a program that turns on three LEDs successively green, then orange, then red
When the next LED turns on, the previous one must turn off, and the program should run indefinitely.

- **EX4 TMR0 Delay**

➢ Create a **1 second delay** using **Timer0** of the **PIC16F84**, equipped with a **4 MHz crystal**.

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➢ Make an LED blink using a **5 second delay** with **TMR0**, with a **4 MHz oscillator**.
➢ Write a program that blinks an LED connected to an output of **PORTB**.
The delay used to adjust the blinking frequency must be obtained by **TMR0 overflows**.

■ **EX5** **WDT DELAY**

For blinking an LED, create a delay using the **WDT (Watchdog Timer)** of the **PIC16F84**,

equipped with a **4 MHz crystal**.

■ **EX6:** Interruption

a) Write a program that changes the state of an LED connected to **RA0** at each **rising edge** detected on **RB0** (interrupt).

b) Each time input **RB0** goes from **1 to 0**, the LED connected to **RB1** must blink **5 times** with a rhythm of **0.6 seconds**.The PIC is clocked by an **8 MHz crystal**.