Practice April 21 – Interrupt and timers

This practice has to be done with the LaunchPad and the small red module with 2 buttons.

There will be more programs to read than lines of code to write !

Take the time to see what each statement in the given examples. Then you will be able to make the requested changes.

1) **Input change interrupt**

Look at the program Inter. Test it !

With some buttons, you will see contact rebounds.

- Modify the program to make him react on the release of the button.
- Then modify it to make him react on both edges.

2) **Communication between the interrupt routine and the main program**

We often need to produce the actions in the main program. Crate a global variable `char flagInter`. Replace the action on the LED int the interrupt routine by : `flagInter = 1;`

In the main loop, write :

```
if (flagInter) {
  Led1Toggle;
  flagInter = 0;
}
```

If you have seen contact rebounds, you can avoid them adding `AttendeMs(20)` after `Led1Toggle`.

3) **Timer in « polling » mode**

Look at the program Timer.c. What should happen? Test it.

Modify the program, changing the Timer initialization line :

```
TACTL = TASSEL_2 + ID_1 + MC_2;
```

- What should happen? Test it.

4) **Timer in «interrupt» mode**

Look at the program Timer-Inter-Compare.c. Test it.

- What happens to you if you change the value of TACCR0 ? (for example : `CCR=1000)`. Why ?

5) **PWM with Timer and interrupts**

Look at the details of the program Timer-Inter-2. Test it.

You almost have what you need to manage a PWM (even two) :

- Put Led1On and Led1Off at the good places to make a PWM
- Set the frequency (16 MHz, no division)
- Use CCR1 for the second PWM (on Led2).