Carleton UNIVERSITY

Department of Systems and Computer Engineering

SYSC-3310: Laboratory 7

Timer Modes

As this lab needs the physical board, this will be a group lab.
Each group should submit one deliverable set mentioning the group number and students' names/IDs.
Any student in the group can submit the deliverable but make sure to write all student names of the group.

*The lab deliverable is **one-weeks** due from your lab session date.*

Lab 7 – Timer Modes

In this lab, you will exercise 2 things: programming interrupts and configuring/using the timers. It's assumed you are already well versed in I/O. The goal is to refresh and practice Timer configuration and ISR usage.

Things to look out for:

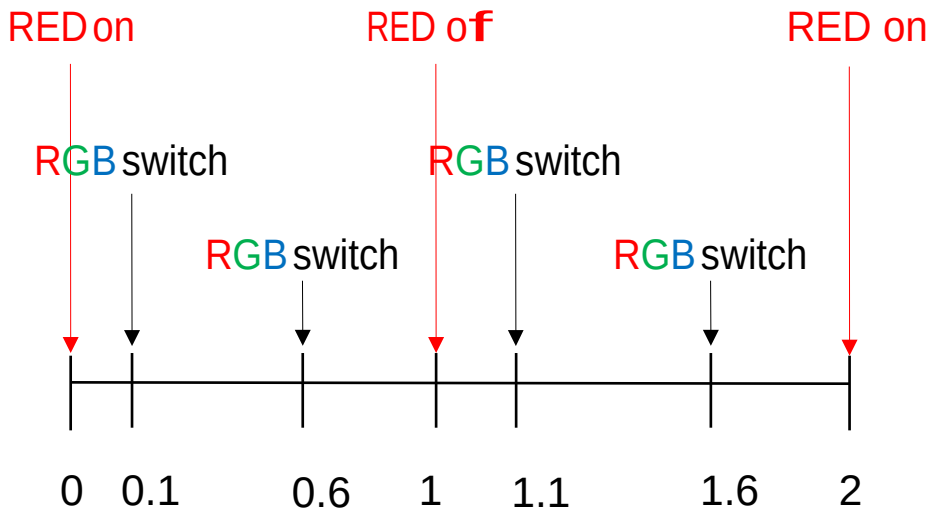
Configuring timer(s) correctly.
Configuring interrupts correctly.
Implementing ISRs correctly.
All other required configurations
Correct program behavior

Create a new project in Keil, named "Lab5".

In this project, you should:

1 - Disable the Watchdog timer!
2 - Configure the LEDs (P1.0 and P2.0, P2.1, P2.2) as outputs.
3 - Initialize LEDs states (all turned off).
4 – Configure 2 Timers A (16 bits) accordingly.
5 – Implement switch and timer ISRs

We want one Red LED to blink (on/off) every second, and the second LED (RGB) to blink (change to next color) every 0.5 seconds. The two LEDs should be out of phase by precisely 0.1 seconds (see diagram below). Use TimerA0 in UP mode (and corresponding interrupts) to trigger the RED LED and TimerA1 in UP/DOWN mode (and corresponding interrupts) to trigger the RGB LED.



To get the marks for this lab, submit the following:

1) Your project folder in a single zip file. Name your project zip file like this: **Lab7Proj_<Group_number>.zip**
   Your zip folder MUST include the entire Keil project folder
2) A ***video*** that shows a DEMO of your project testing on the board.
3) A single page that includes
   a. Half page summary of what you have done and learned from this lab
   b. Your group number and students' names/IDs