University of Jordan
School of Engineering
Department of Mechatronics Engineering
"Microprocessors and Microcontrollers
Applications Laboratory"
0908435
Assignment #2

Objectives

1-To become familiar with hardware timers in 16F877A PIC.

2-To demonstrate the use of internal interrupts linked with hardware timers in 16F877A PIC.

3-To use the debugging facility of the MPLAB IDE to fix program bugs.

Description:

The main objective of this Assignment is to design a "Traffic Light Control System" using a PIC microcontroller that controlled **simple intersection with two traffic lights.**

You are required to design and build a simple **road intersection** with the following core specification:

-For the traffic light system write an **assembly** code using PIC 16F877A with a crystal oscillator of frequency **4MHz**. And record a video of your code simulation using MPLAB software and hardware simulation*.

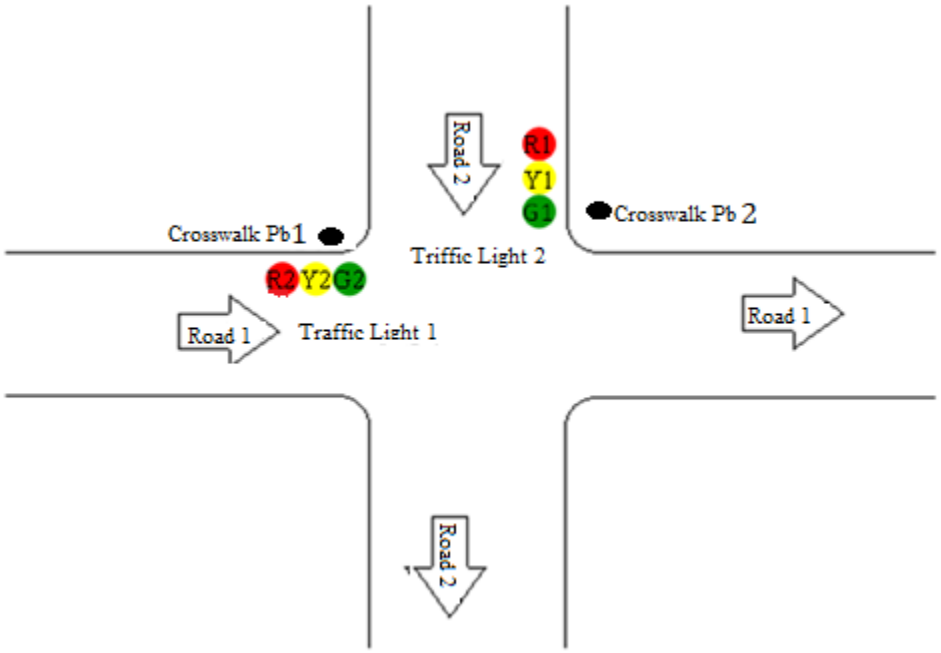

Figure1 Traffic Light Intersection.

***Hardware simulation is not a compulsory requirement.**

Traffic light Specifications:

The hardware contains the following components as shown in Figure 2:

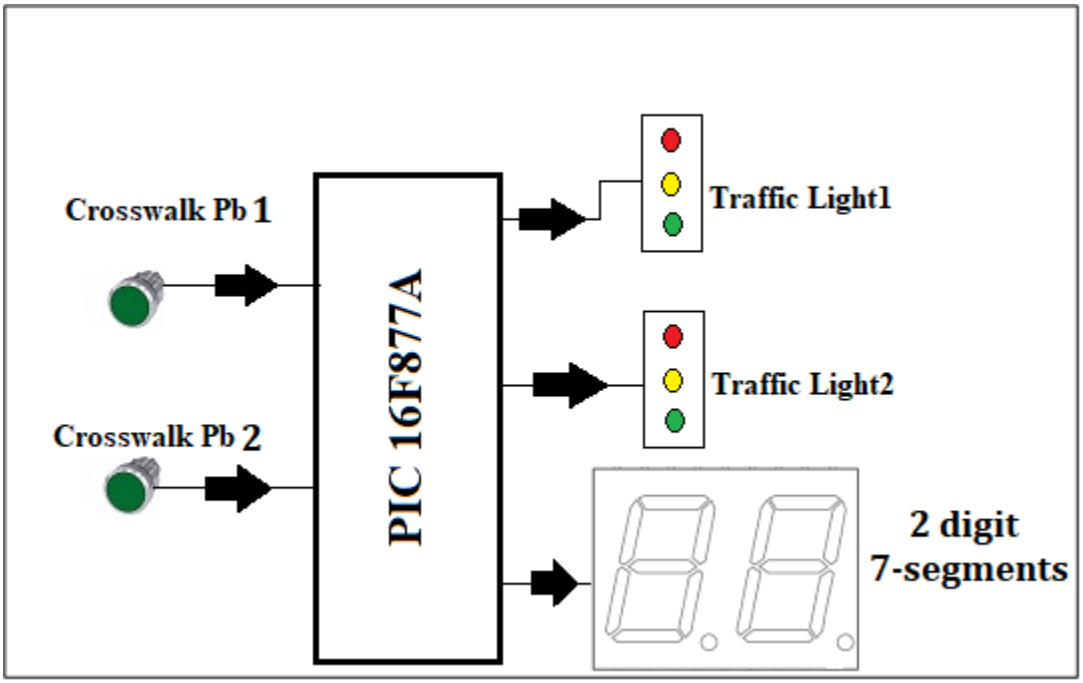

Figure 2 Block Diagram for system.

- The project works as following: -

1- The timing diagram of two traffic lights is: -

Table 1

Red (TL2)			Green (TL2)	Yellow (TL2)
Green (TL1)	Yellow (TL1)	Red (TL1)		
8 sec	4 sec	3sec	8 sec	4 sec

2- Countdown the time of each light (for one traffic light) and show the time on **the 2 Digit 7-Segments.**

3- If any crosswalk Pbs is pressed **ten times** or **pressed for 2 sec.** the walkers can cross the road for **5 sec** then continue the sequence as table 1. (**Countdown the crossing time and show it on the 7-segmentd**) *

4- If no car pass through any road for 5 sec. exchange the traffic light status. (Bonus)

Rules of submission

1-Do not use software delays in your code.
2-You can submit individually or with your colleague. (two student only otherwise the submission cancelled)
3-The deadline of submission is Thursday 20 / 05 / 2021 at 11:59 PM. (There is no extension for any reason whatsoever.)
4-If the submission does not include video of MPLAB simulation, the submission will be cancelled.

***Note that when the walkers crossing the road the green light of another road goes on.**