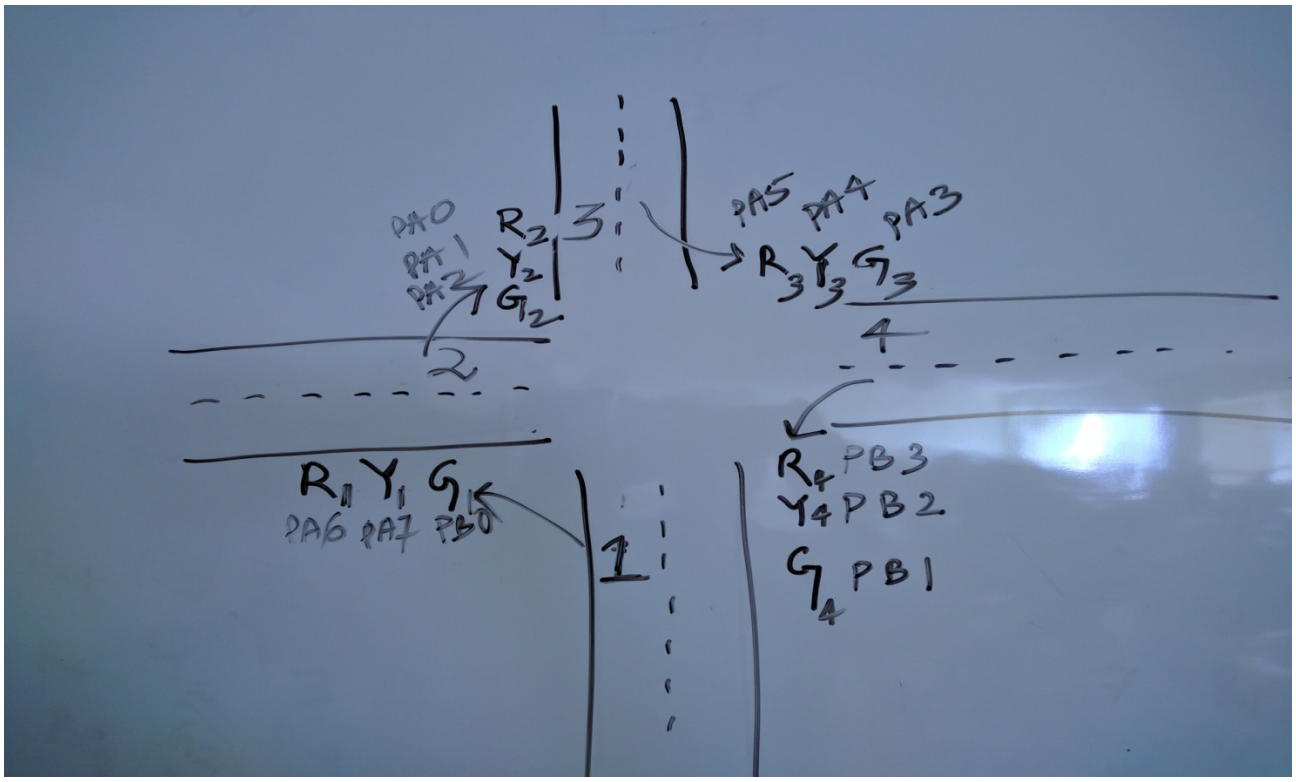
Lab 7: Design of a Traffic Light Controller

Demonstration of traffic light controller

Upper inter section of cross road of the TLLC board is given in following figure. In this figure1,2,3,4 are the 4 lanes. R1,Y1,G1 are the red , yellow and green lights of the lane 1. PA6,PA7,PB0 are the ports for R1,Y1,G1 correspondingly.



The following table describes the different states of the ON lights at the intersection, their corresponding ports and the value of A,B,C required to glow the LEDs for the specific ports.

DELAY2 is the delay between green to yellow or red to yellow. (5 seconds delay)
DELAY1 is the delay between yellow to green or yellow to red. (1 second delay)

STEP NO	ON LIGHT	CORR PORT BIT	VALUE OF A	VALUE OF B	VALUE OF C	DELAY
1	G1 R4 R2 R3	PB0 PB3 PA0 PA5	21	09	00	DELAY2
2	Y1 R4 Y2 R3	PA7 PB3 PA1 PA5	A2	08	00	DELAY1
3	R1 R4 G2 R3	PA6 PB3 PA2 PA5	64	08	00	DELAY2
4	R1 R4 Y2 Y3	PA6 PB3 PA1 PA4	52	08	00	DELAY1

5	R1 R4 R2 G3	PA6 PB3 PA0 PA3	49	08	00	DELAY2
6	R1 Y4 R2 Y3	PA6 PB2 PA0 PA4	51	04	00	DELAY1
7	R1 G4 R2 R3	PA6 PB1 PA0 PA5	61	02	00	DELAY2
8	Y1 Y4 R2 R3	PA7 PB2 PA0 PA5	A1	04	00	DELAY1

Sample code for the state of ON light described in step 1 of the above table :

```
MOV AL,80
MOV DX,8006 //CONTROL REG
OUT DX,AL
MOV AL,21
MOV DX,8000 //PA
OUT DX,AL
MOV AL,09
MOV DX,8002 //PB
OUT DX,AL
MOV AL,00
MOV DX,8004 //PC
OUT DX,AL
```

DELAY 2(5 seconds delay)

NB: Above mentioned 8 steps is a single round. This round will be repeated continuously.

Assignment

1**:** Implement a program for traffic light control as explained above in the TLLC board for both intersections of cross road. There are 24 LEDs whose function is associated with a color.

2. Write a program to flash all red lights for 5 seconds, all yellow lights for 1 second and all green for 2 seconds in continuously

Submission:

(Hardcopy submission in the Lab: 14th September)

STEP NO	ON LIGHT	CORR PORT BIT	VALUE OF A	VALUE OF B	VALUE OF C	DELAY
1	R1 R2 R3 R4	PA6 PA0 PA5 PB3	69	08	00	DELAY2
2	Y1 Y2 Y3 Y4	PA7 PA1 PA4 PB2	91	04	00	DELAY1
3	G1 G2 G3 G4	PB0 PA2 PA3 PB1	0C	03	00	2*DELAY 1