TRAFFIC LIGHT PROJECT

System description:

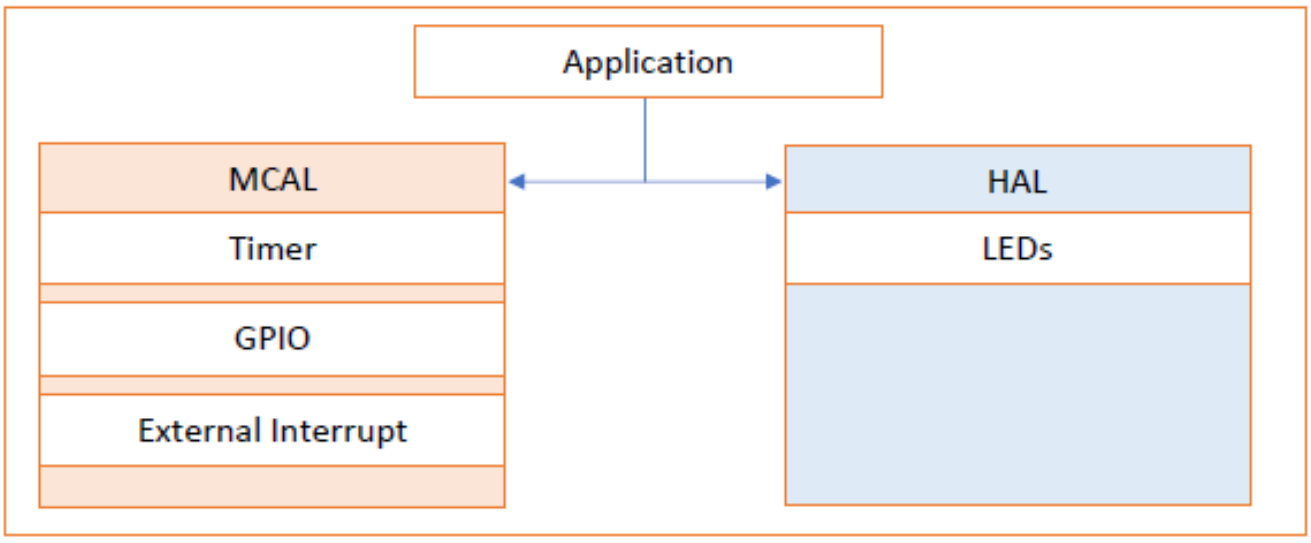
A System to control crossing the street for the pedestrian. We made Two traffic light one for the cars and one for pedestrian.
Car traffic light is working automatically, while pedestrian traffic need's the pedestrian to push its button.
If the car traffic is red the pedestrian traffic light is green which mean the pedestrian can cross the street.
If the car traffic is Yellow, the pedestrian traffic light is also Yellow which mean the pedestrian wait 5 sec until the pedestrian traffic become green can cross the street.
If the car traffic is Green, the pedestrian traffic light is Red which mean the pedestrian can't cross the street and must wait until it become green.

System design:

Driver which I used:

1) Timer Module: to control the traffic flow lights.
2) Interrupt Module: to begin the pedestrian processing.
3) Common Macros Module: to simplify my code.
5) GPIO Module: General input output driver.
6) Leds Driver: for traffic leds output.
4) Application Module: to collecting all the procced data in one file.

System flow chart:



System Constrain:

The car traffic light working correctly until an interrupt happened.
The interrupt makes the pedestrian traffic light to be on, so we have more than one case.
First case when car traffic light is red the pedestrian traffic light is green.
Second case when car traffic light is green then pedestrian traffic become yellow blinking and red is on for 5 sec then pedestrian become green, and car become red for 5 sec.
Third case when car traffic light is yellow then pedestrian traffic become yellow blinking and red is on for 5 sec then pedestrian become green, and car become red for 5 sec.
So, I used timer 0 for control the traffic flow & used external interrupt for pedestrian traffic to work efficiently.

Flow of the system:

Normal Mode:

- Red then Yellow then Green. (Car traffic)

Pedestrian Mode:

- If car traffic is Red, then pedestrian Green
- If car traffic is Yellow, the pedestrian is yellow blinking with red led on.
- If car traffic is Green, then it goes to yellow flashing with pedestrian with red led on.

Flow of the system Coding:

Normal Mode:

- Only we need a timer to change the traffic light every 5 second so I used timer-0 to change the state of traffic every 5 second using prescaler 1024 to give an interrupt every 0.25 sec with initial value 6.

Pedestrian Mode:

- An interrupt will happen, the code will go to ISR code to run it which make the flow of pedestrian traffic light.