Traffic Light Control
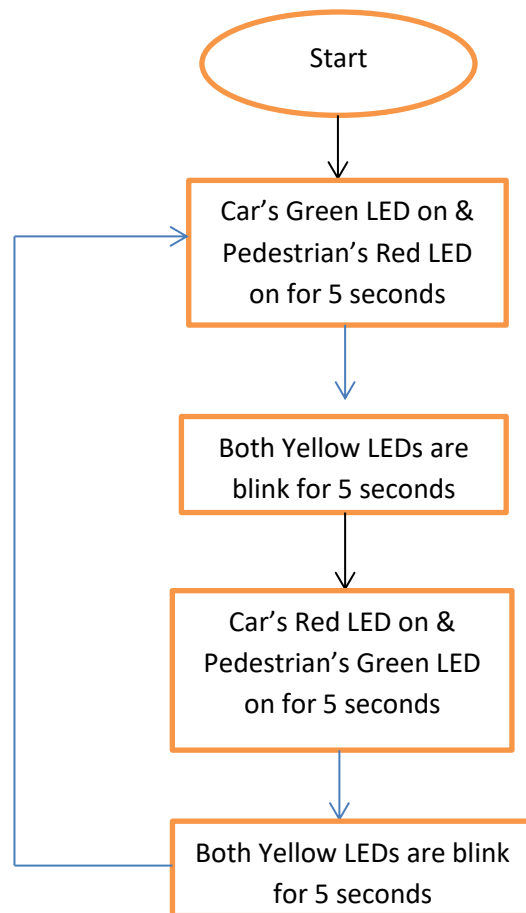
System Description:

1. Normal Mode:
   - Traffic Light system will be changed Red, Yellow, and Green respectively. From one light to another 5 seconds.
   - Before moving to Red or Green, the Yellow LED will blink for five seconds.
2. Pedestrian Mode:
   - While push button is pressed, it will change from normal mode to pedestrian mode.
   - If pressed when car's Red LED is on, the system will do nothimg.
   - If pressed when car's Yellow Led is blinking and car's green LED is on, Yellow LED will be blinking for five seconds, and then car's Red LED and pedestrian Green LED will be on.

System Design:

1. Hardware Components:
   - ATmega32 microcontroller.
   - One Push button connected to INT0 pin.
   - 3 LEDs for Cars and Pedestrian.
2. Software Programming:
   - Common File including header file for bit manipulation.
   - Microcontroller Abstraction Layer (MCAL) or ECUAL containing .c and .h files for each hardware preferal.
   - Hardware Abstraction Layer (HAL) for LED and Push button drivers.
   - Application Layer.

Flow Chart:

```
        ┌─────────────┐
        │    Start    │
        └─────────────┘
               │
               ▼
   ┌──────────────────────┐
   │  Car's Green LED on & │
   │  Pedestrian's Red LED │
   │    on for 5 seconds   │
   └──────────────────────┘
               │
               ▼
   ┌──────────────────────┐
   │  Both Yellow LEDs are │
   │   blink for 5 seconds │
   └──────────────────────┘
               │
               ▼
   ┌──────────────────────┐
   │   Car's Red LED on &  │
   │ Pedestrian's Green LED │
   │    on for 5 seconds   │
   └──────────────────────┘
               │
               ▼
   ┌──────────────────────┐
   │ Both Yellow LEDs are blink │
   │    for 5 seconds      │
   └──────────────────────┘
```

System Constraints:

1. Pedestrian makes a short press.
2. Double press and Long press are ignored.