ON-DEMAND TRAFFIC LIGHT CONTROL

OVERVIEW
1. Project Description We have:
1. ATmega32 microcontroller
2. One push button connected to INT0 pin for pedestrian
3. Three LEDs for cars - Green, Yellow, and Red, connected on port A, pins 0, 1, and 2
4. Three LEDs for pedestrians - Green, Yellow, and Red, connected on port C, pins 0, 1, and2

we have Also 2 modes:
1. Normal mode: If the pedestrian push button isn't pressed, Cars' LEDs will be changed every five seconds starting from Green then yellow then red then yellow then Green, car's yellow led will blink five seconds before moving to Green or Red LEDs.

2. Pedestrian mode: we have two cases: when pedestrian push button is pressed, case 1 if the car's red led on, car's red led will on for another 5 seconds and pedestrian's green led on for 5 seconds, case two if the car's yellow or green leds on, the two yellow leds will blink for 5 seconds, then the car's red led, and pedestrian's green led will be on for 5 seconds.

2. system design

Application		
Button		Led
DIO	Timer	Interrupt
Microcontroller		

```
                                              ┌──────────────┐
                                    ┌─────────│ is car's red │ NO
                            ( A ) ⇨ │         │  led on ?    │──────────┐
                                    └──────────────┘                    │
   ( start )                              YES                           │
      ⇩                                    │                            │
 ┌──────────┐                              │                            │
 │    is    │ YES                          │                            │
 │  button  │ ⇨ (A)                        │                            │
 │ pressed  │                              │                            │
 └──────────┘                              │                            │
      ⇩ NO                                 │                            │
 ┌──────────────┐        NO                │                            │
 │car's green led on│ ⇦─────────────────┐  │                            │
 │ped's red led on  │                   │  │                            │
 └──────────────┘                       │  │                            │
      ⇩ NO                              │  │                            │
 ┌──────────┐                           │  │                            │
 │    is    │ YES                       │  │                            │
 │  button  │ ⇨ (A)                     │  │                            │
 │ pressed  │                           │  │                            │
 └──────────┘                           │  │                            │
      ⇩ NO                              │  │                            │
 ┌──────────────┐                       │  │                            │
 │car's yellow on │──────────────────────┘  │                            │
 │ped's red on    │                          │                            │
 └──────────────┘                            │                            │
      ⇩                                      │                            │
 ┌──────────┐                                │                            │
 │    is    │ YES                            │                            │
 │  button  │ ⇨ (A)          (A)             │                            │
 │ pressed  │                 ⇧ YES          │                            │
 └──────────┘                 │              │                            │
      ⇩ NO                    │              │                            │
 ┌──────────┐      ┌──────────┐    ┌──────────────┐   ┌──────────┐       │
 │car's red on│ ⇨  │    is    │ NO │car's red on  │ ⇨ │    is    │       │
 │ped's green on│   │  button  │ ⇨ │pad's yellow on│   │  button  │       │
 └──────────┘      │ pressed  │    └──────────────┘   │ pressed  │       │
      ⇧            └──────────┘                        └──────────┘       │
      │                                                     YES           │
      └─────────────────────────────────────────────────────┴────────────┘
```