On-demand Traffic light control

system layers

- MCAL
- ECUAL
- Application
- Test Module
- Utilities

system drivers

- app
- Led
- Button
- Timer
- Interrupt
- Doi
- Typedef
- Registers
- Test

data types

- typedef unsigned char uint8_t
- typedef unsigned short uint16_t
- typedef enum EN_FLAG_FUNCTION
- {WRONG, Ok , WRONG_Timer , WRONG_Dio , WRONG_Led ,WRONG_Button , WRONG_Application }EN_FLAG_Error_t

system description

- **system contains**

1. ATmega32 microcontroller
2. One push button
3. Six LEDs for cars -2 Green, 2Yellow, and 2Red

- **System purpose**

1. Two traffic lights for people and cars.
2. Traffic lights signals are going between the normal mode and pedestrian mode by push button.

- **Requirements In normal mode:**

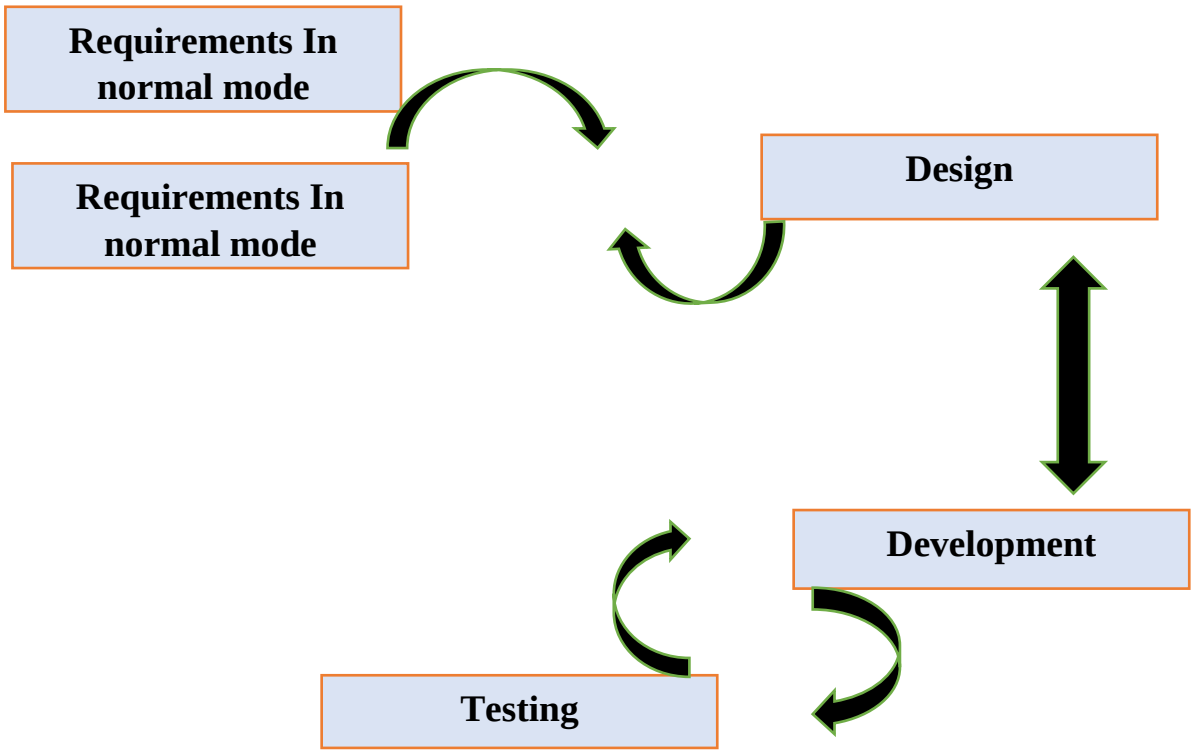
1. Cars' LEDs will be changed every five seconds starting from Green then yellow then red then yellow then Green.
2. The Yellow LED will blink

- **Requirements In pedestrian mode:**

1. If pressed when the cars' Red LED is on, the pedestrian's Green LED and the cars' Red LEDs will be on for five seconds.
2. If pressed when the cars' Green LED is on or the cars' Yellow LED is blinking, the pedestrian Red LED will be on then both Yellow LEDs start to blink for five seconds, then the cars' Red LED and pedestrian Green LEDs are on for five seconds.
3. At the end of the two states, the cars' Red LED will be off and both Yellow LEDs start blinking for 5 seconds and the pedestrian's Green LED is still on.
4. After the five seconds the pedestrian Green LED will be off and both the pedestrian Red LED and the cars' Green LED will be on.

system design

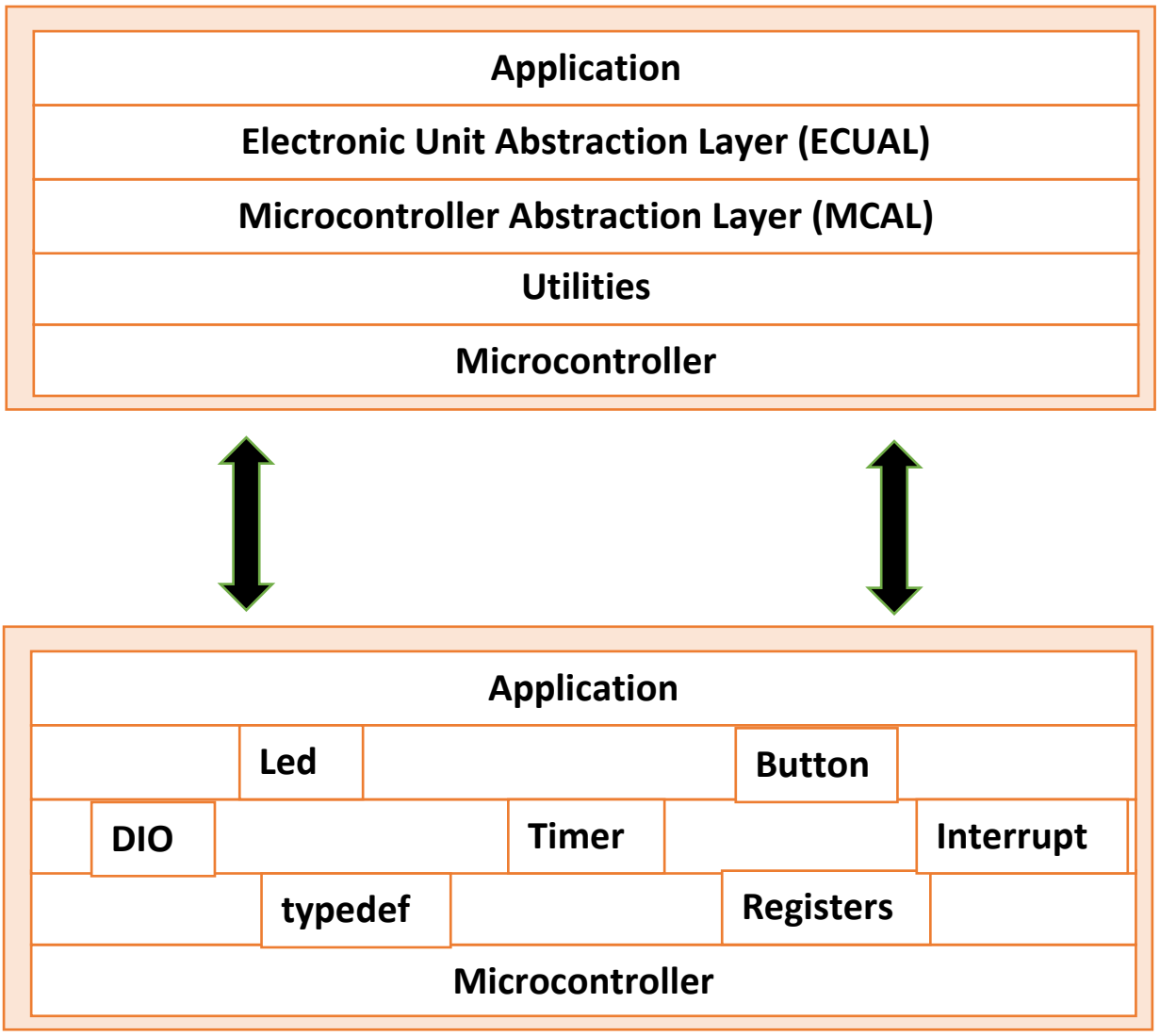
- **transform requirement into suitable form.**
- **water full model was used in project**



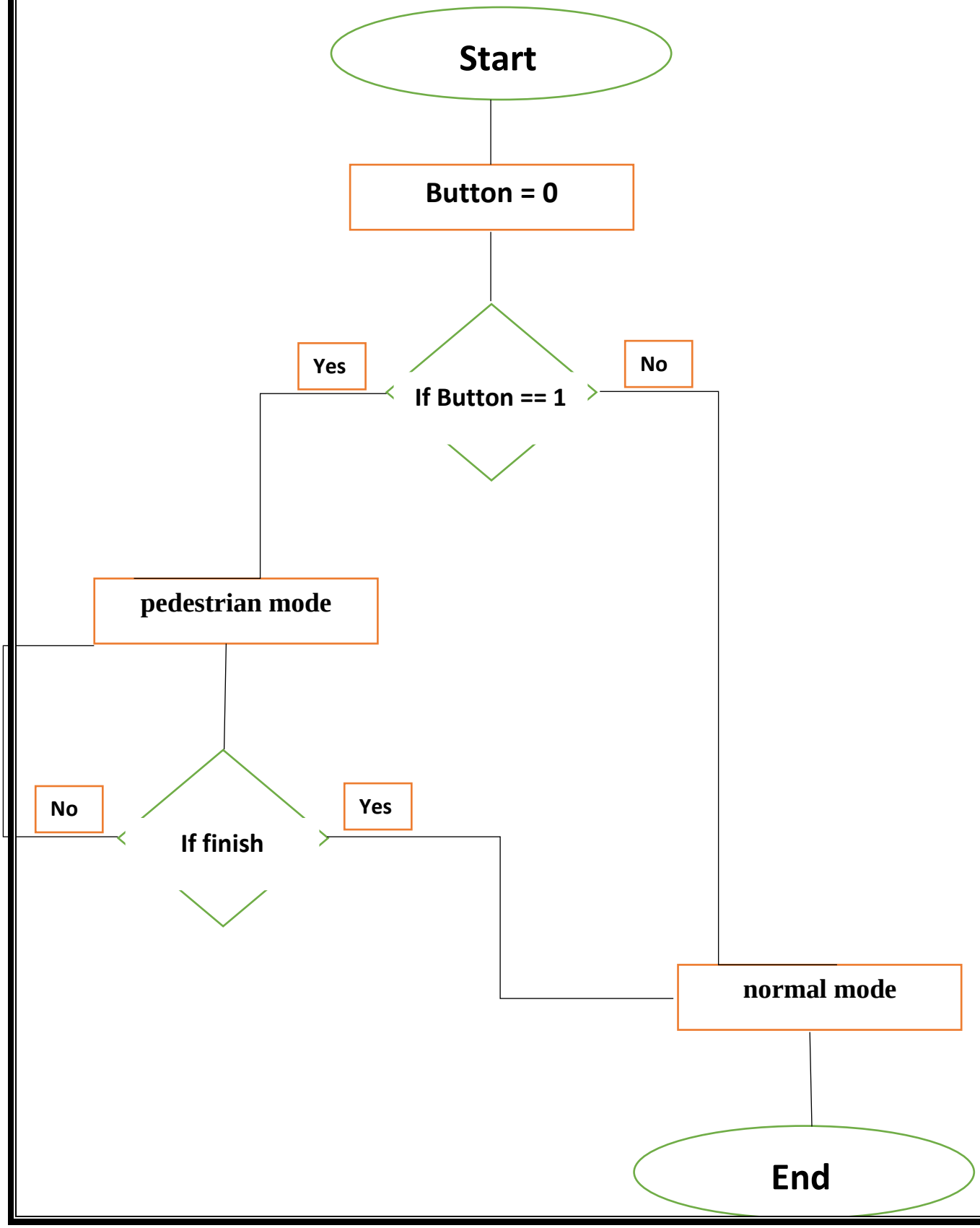
- **Static design**
  - **Modules:**
    1. Led
    2. Button
    3. Timer
    4. Interrupt
    5. Doi
    6. Typedef
    7. Registers

  - **Components:**
    1. ATmega32 microcontroller
    2. One push button
    3. Six LEDs for cars -2 Green, 2Yellow, and 2Red

- **Layered architecture**



system flow chart



system constraints

1- There is wasted time during reach next instruction.
2- System may affect on movement of cars and road.
3- Long press on the crosswalk button, nothing to be done.
4- Double press on the crosswalk button, the first press will do the action and nothing to be done after the second press.
5- pededstrian green light must be on for five seconds, pededstrian can cross the street.