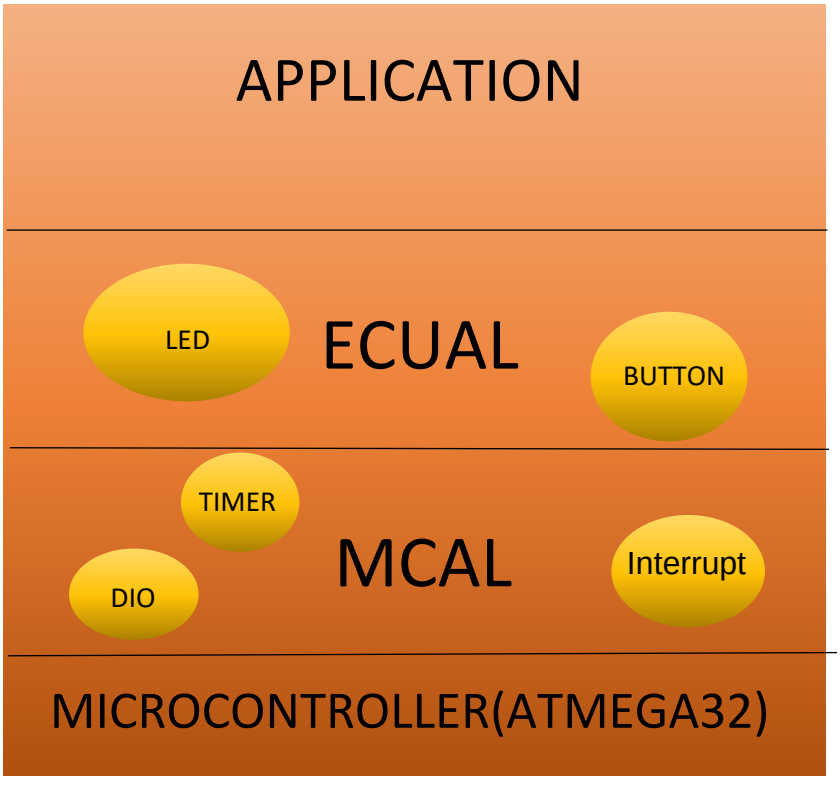
- **System description:**
  traffic lights system with an on-demand crosswalk button. Crosswalk buttons let the signal operations know that someone is planning to cross the street, so the light adjusts, giving the pedestrian enough time to get across.

- **System design:**
  system layers: microcontroller, MCAL, ECUAL, application
  system drivers: DIO, Timers, interrupt, LED, Button



DIO APIs

```
void DIO_init(uint8 portNumber, uint8 pinNumber, uint8 direction);
void DIO_write(uint8 portNumber, uint8 pinNumber, uint8 value);
void DIO_toggle(uint8 portNumber, uint8 pinNumber);
void DIO_read(uint8 portNumber, uint8 pinNumber, uint8 *value);
```

Timers APIs

```
void timer_init(void);
void delay_5sec(void);
void timer_init_t2(void);
void delay_5sec_t2(void);
```

interrupt APIs

```
void interrupt_init(void);
```

LED APIs

```
void LED_init(uint8 ledPort, uint8 ledPin);
void LED_on(uint8 ledPort, uint8 ledPin);
void LED_off(uint8 ledPort, uint8 ledPin);
void LED_toggle(uint8 ledPort, uint8 ledPin);
```

Button APIs

```
void BUTTON_init(uint8 buttonPort, uint8 buttonPin);
void BUTTON_read(uint8 buttonPort, uint8 buttonPin, uint8 *state);
```