ON-DEMAND TRAFFIC LIGHT CONTROL

Tarek Abdallah Mohammed hussin

AGENDA

system description

system design

system flow chart

system constraints

Summary

SYSTEM DESCRIPTION

The system is divided into three layer

- Microcontroller Abstraction Layer
- ECU Abstraction Layer
- Application Layer

SYSTEM ARCHITECTURE

MICROCONTROLLER ABSTRACTION LAYER

- In this layer we deal with the basic components of hardware, including peripherals and memory directly by writing in the registers of each peripheral.
- This level is highly dependent on the architecture of the controller, so when the target changes, the parts at this level must be reorganized.
- In our application, we made drivers for some of the peripherals used in the application, including the GPIO, TIMES,
- INTERRAPT.

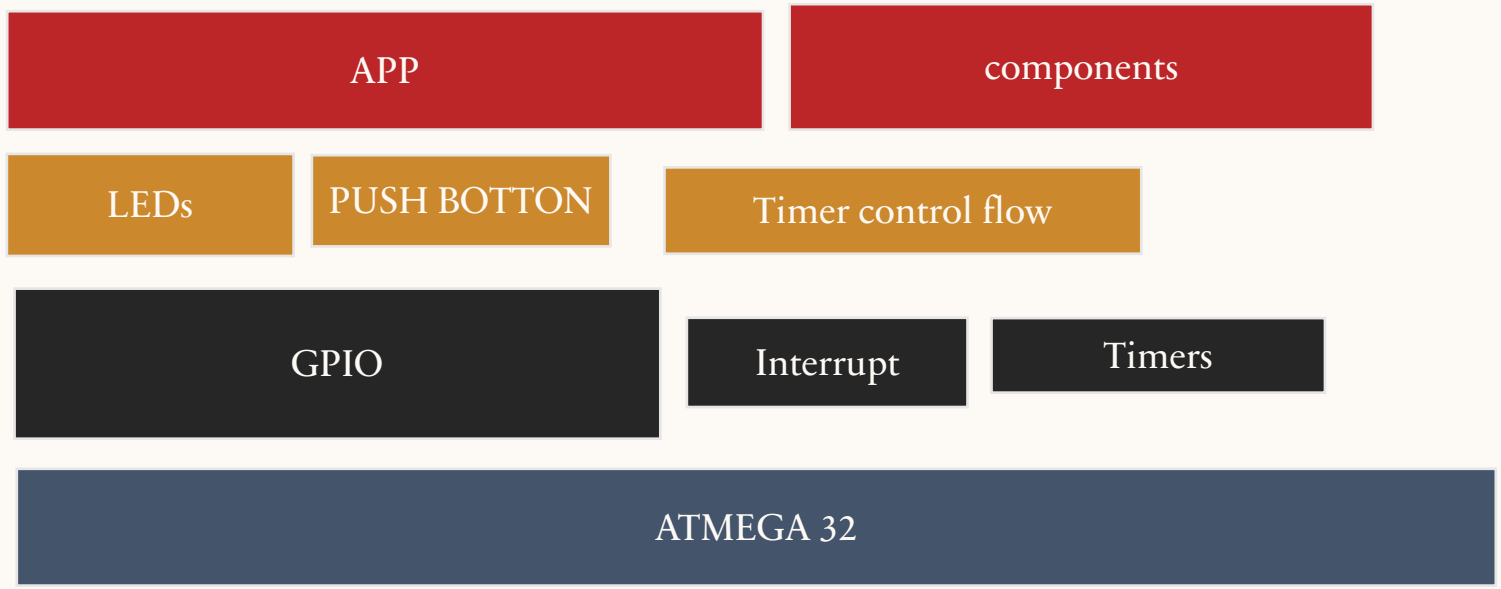
ECU LAYER

- At this level, we configure the controller to deal with external electrical devices, for example LEDs, Push Button
- At this level we completely isolate the controller and deal with the resulting API from the controller level.
- Adjustment at this level occurs when we change the types of inputs or outputs

APPLICATION LAYER

In this layer, we configure the resulting API from the ECU Layer to implement the required function of this application.

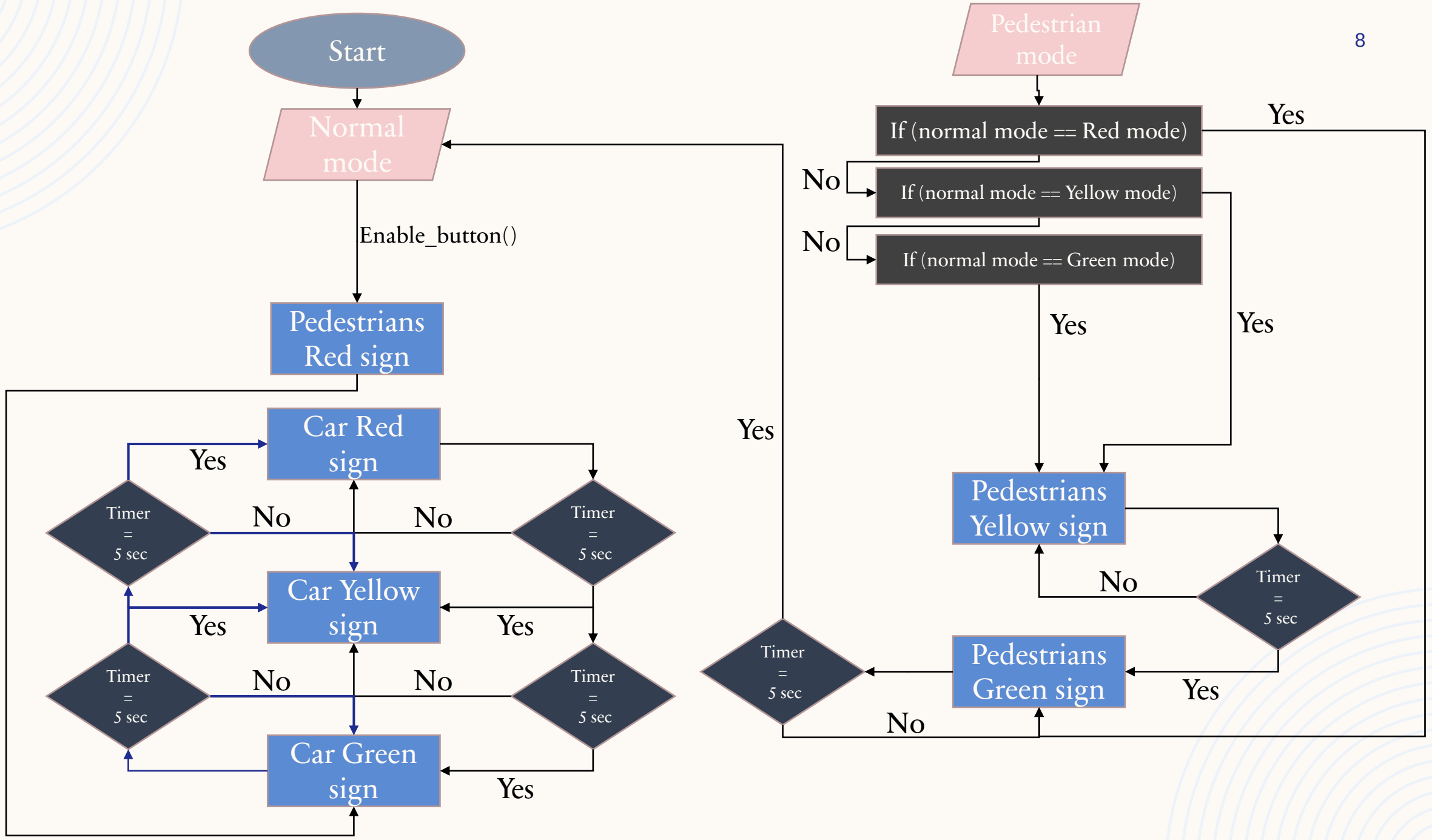
Here we configure the sources by using timers to convert between signals and achieve the logarithm described in the following slides

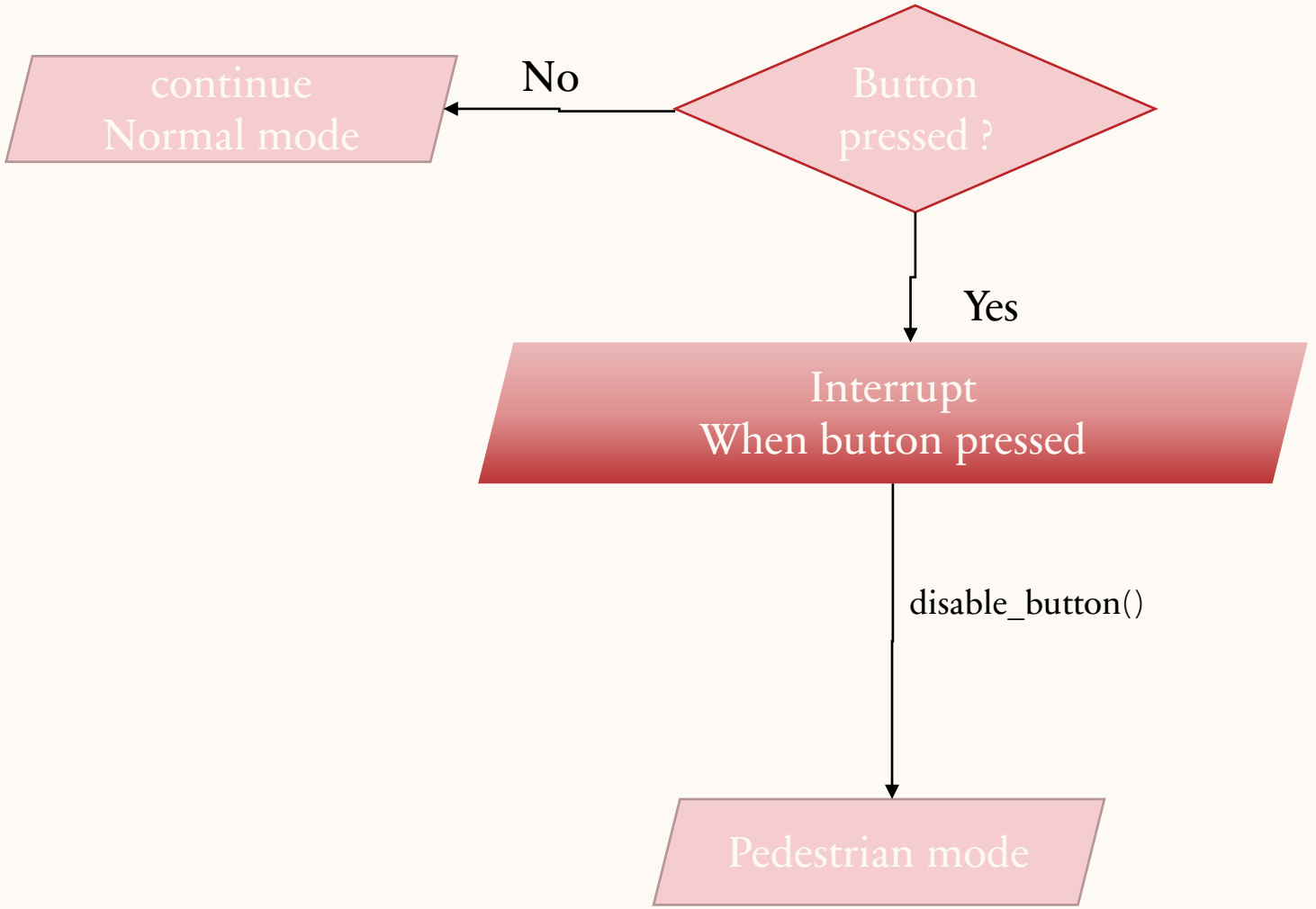

APP
components
LEDs
PUSH BOTTON
Timer control flow
GPIO
Interrupt
Timers
ATMEGA 32

FLOW CHART

We have 3 LEDs for cars traffic and anther 3 LEDs for pedestrians, so we have two mode normal mode for cars and pedestrians mode.

Can switch from between two mode by button


Start
Normal mode
Enable_button()
Pedestrians Red sign
Car Red sign
Yes
Timer = 5 sec
No
No
Timer = 5 sec
Car Yellow sign
Yes
Yes
Timer = 5 sec
No
No
Timer = 5 sec
Car Green sign
Yes
Yes
Pedestrian mode
If (normal mode == Red mode)
Yes
No
If (normal mode == Yellow mode)
No
If (normal mode == Green mode)
Yes
Yes
Pedestrians Yellow sign
No
Timer = 5 sec
Pedestrians Green sign
Yes
Timer = 5 sec
No


Button pressed ?
No
continue Normal mode
Yes
Interrupt When button pressed
disable_button()
Pedestrian mode

THANK YOU

dabourt62@gmail.com