

Extra-points Project  
Part 1

Expected delivery of **extrapoint\_01.zip** must include:

- The zipped folder of your project
- A 4 minutes video (.mp4 or .avi) showing a running software debug session with significant peripheral windows shown.

Purpose of Part 1: to acquire full confidence in the usage of the KEIL software debug environment to emulate the behaviour of the LPC1768 and the LANDTIGER Board.

This part is evaluated to assign a maximum of 2 extra-points for qualified students taking the exam with vote  $\geq 18$

Start from the 16b\_sample\_BUTTON\_LED\_NVIC\_PCON\_TIMER project to develop the controller of a pedestrian crossing semaphore.

You are asked to write a program for the LandTiger Board that permits to reproduce the behaviour of a simple semaphore on a pedestrian crossing. An example is provided in figure 1. The crossing is regulated by

- 2 types of traffic lights:
  - o 2-lights pedestrian traffic light (see figure 2)
  - o 3-lights pedestrian traffic light (see figure 3)
- Pushbutton panels for pedestrian request see (figure 4)

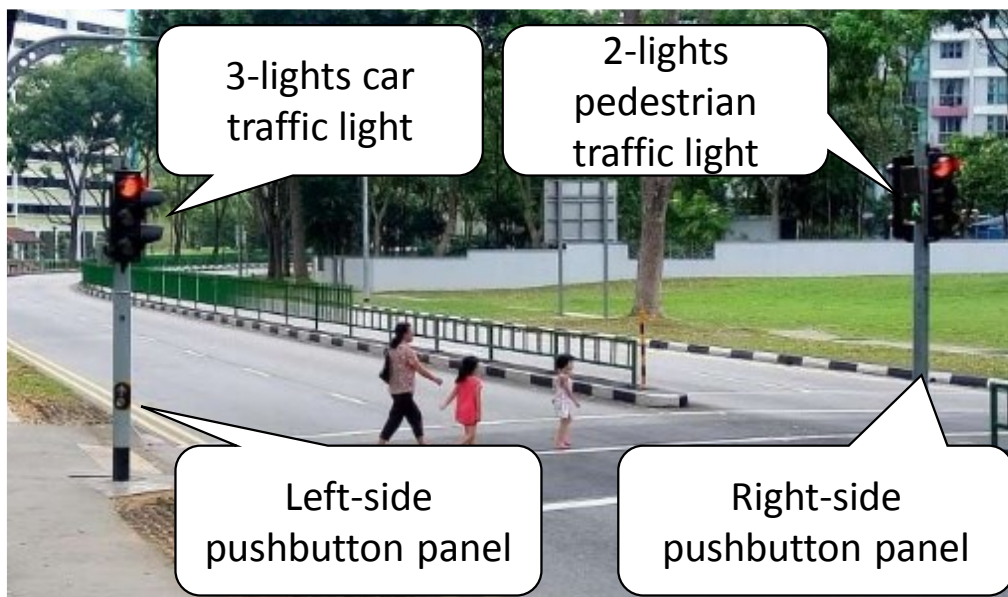


Fig 1: general view of the scenario



Fig. 2 pedestrian traffic light



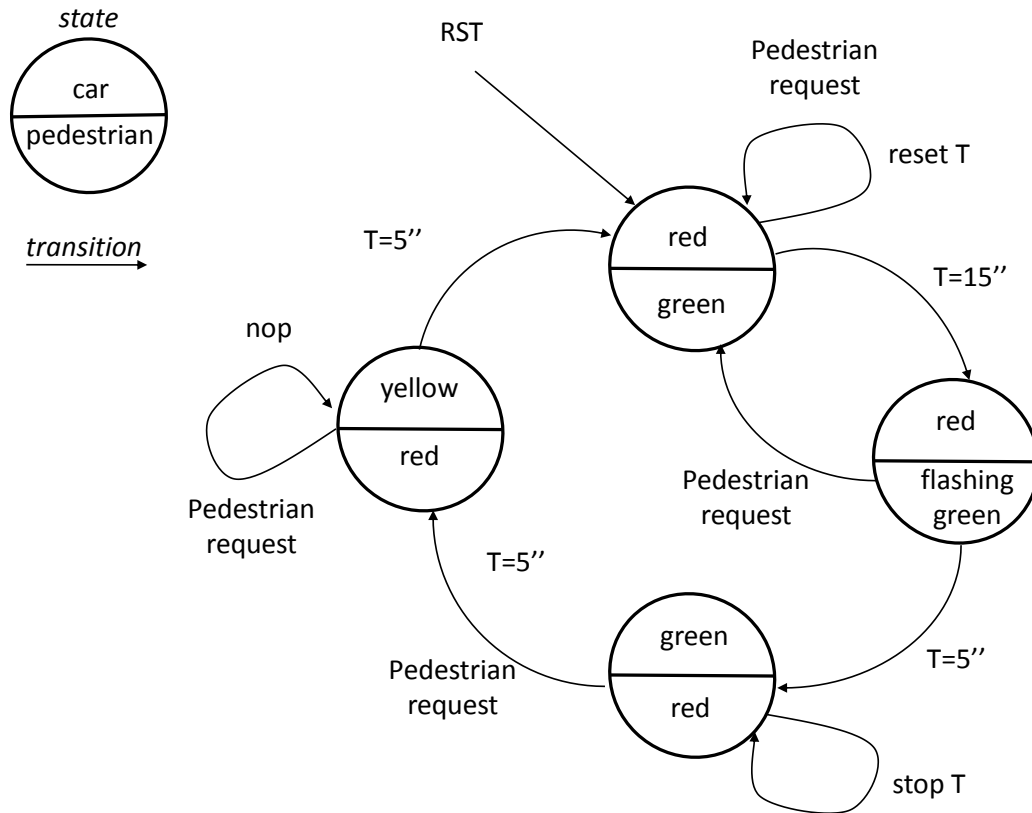
Fig.3 cars traffic light



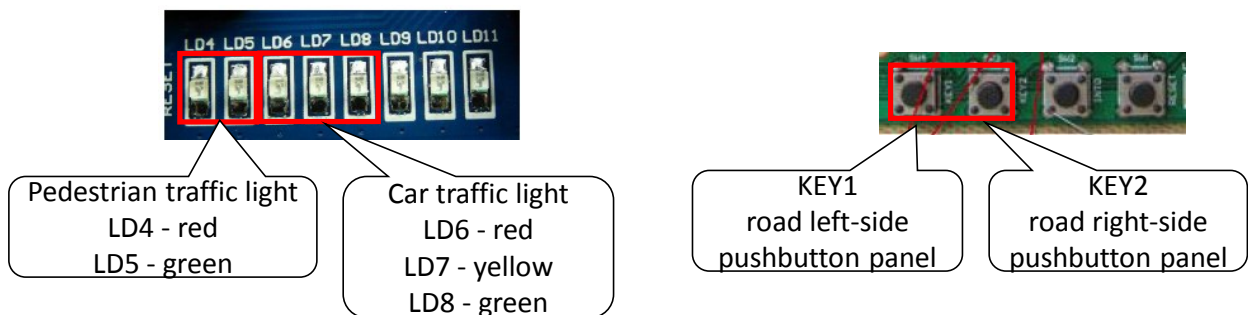
Fig.4 pushbutton panel

The state diagram of the traffic light behaviour is depicted below. It describes a night condition of traffic where the pedestrian crossing is rare and a reduced number of cars is expected. The traffic light has to ensure to pedestrian a maximum wait time of 10 seconds and 20 seconds of crossing time.

You are required to implement the following state and transition diagram. T indicates the time to move from a state to another state if not immediately.



Use the LEDES and BUTTONS to reproduce the various components of the traffic light as indicated below.



Led 5 flashing is performed at 2 Hz frequency (repeatedly 0.5 sec on/0.5 sec off).  
Leds 9/10/11 are not used.