

# Designing a traffic light controller

## Lab 2, ESDM

### Objective

Introducing students to the Simulink environment and the Stateflow component.

### Theoretical aspects

TBD

### Exercises

1. Create a model for a car traffic light controller, according to the specifications below.

#### Model specifications

The model shall control the light of a car traffic light.

Inputs:

- button: boolean. Button available for pedestrians to press, when they want to cross the street

Outputs:

- sigR: boolean. Control RED light. TRUE to turn on red light, FALSE to turn it off.
- sigY: boolean. Control YELLOW light. TRUE to turn on yellow light, FALSE to turn it off.
- sigG: boolean. Control GREEN light. TRUE to turn on green light, FALSE to turn it off.

### Requirements:

- Red light lasts for 30 seconds.
  - Red light is followed by green light.
  - Green light lasts at least 60 seconds.
  - If no pedestrian presses the button, green light lasts indefinitely.
  - If a pedestrian presses the button, green is followed by yellow:
    - If the button is pressed during the first 60 seconds of green, yellow happens after the 60 seconds expire
    - If the button is pressed after the first 60 seconds, yellow happens immediately
  - Yellow light lasts for 5 seconds, and is followed by red
  - Upon initialization, the system defaults to red
2. Extend the model in the following way:
- Add two new outputs for the pedestrian traffic light as well. The pedestrians are shown only red and green: they have when cars have green or yellow, and green when cars have green.
  - Make the yellow light blinking (1 second on, 1 second off).
  - Make the last 8 seconds of pedestrian green blinking.

## Final questions

1. TBD