The intersection between a larger main street and a smaller side street is to be controlled by traffic lights (green-yellow-red) The side street is equipped with a sensor that sense the arrival of a car. The following behavior is desired:

- Keep green light on the main street as long as there are no cars on the side street, and at least for 25 seconds.
- Keep the green light on the side street as long as there are cars on the street, but at most for 25 seconds.
- Keep yellow light for 4 seconds in between switch from green to red. From red you can switch directly to green.

Tasks:

1. Model the different parts of the traffic lights with automata: The two lights and the sensor. You should not restrict the behavior of the system too much at this stage; leave that to the specification. You can also try the parallel composition of the different parts, but it is going to get lots of states. And we do want to avoid states where we have green light for both streets.

2. Formulate the specifications using automata. One can, but do not have to split it up in four parts, two timers, the main street, and the side street. As usual, the parts are connected by events. Main communication events between the street-automata are the ones switching on the green lights.

3. Design a non-blocking and controllable supervisor for the system.

This time it is going to get more complicated, so the use of Supremica is recommended. Include in the report automata for the different parts (models, specifications) and the final supervisor.

Hints: Be careful with which events are controllable, and which automata are plants and which are specifications. If all events are controllable or all automata are plants you will have little problems. You can restrict uncontrollable events, but only in the plant automata. The sensor and the associated events are critical in this assignment.

It can be beneficial and in practice also desirable that the sensor event which tells that there are no longer cars in the intersection cannot happen when we have red light on the side street. It actually makes the supervisor simpler, and there is less risk for that somebody never gets through the intersection.