

**Exercise for the lecture Modeling Methods in Computer Science,
Winter Semester 2007/08**

Ingo Frommholz (LF 138)

Consultation-hour: Thursday, 15:00-16:00

mod07@is.inf.uni-due.de

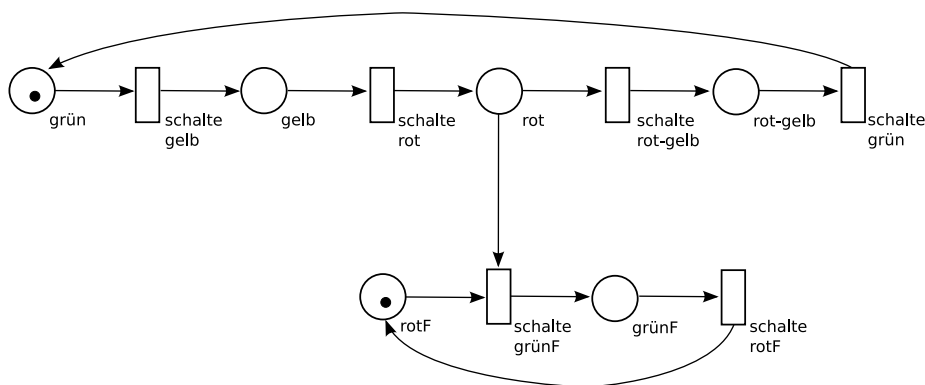
Exercise Sheet 9

Due date: **19.12.2007, 14:00**

Exercise 17: I am waiting at the traffic light...

Please model the functionality of a typical German traffic light, consisting of two signals - one for cars and one for pedestrians - with the help of the following Petri net. For the signal directed at cars You may assume the following: if the traffic light shines green it can switch to yellow (which means that cars may still pass for a very short period of time) and then to red. If it is red it can switch to red-yellow (meaning that cars may slowly start to drive) and then to green. Those signals directed at pedestrians switch from green to red and back from red to green. So, the stages green, yellow, red and red-yellow represent the different stages of the signal for cars such as redF and greenF represent the different stages of the signal for pedestrians. The function of the Petri net is to make sure that pedestrians can cross the street without any danger, i.e. to ensure that no pedestrian may be run over by a car. The point is, of course, that pedestrians can cross the street and cars can drive on alternately.

The following proposition is made:

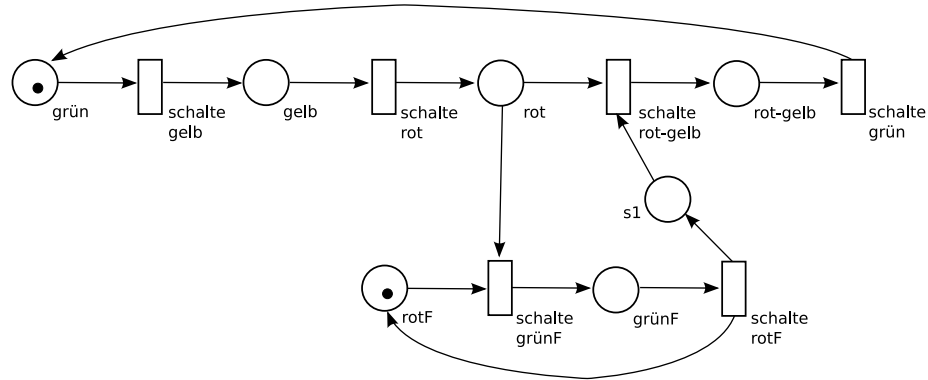


- Please model the reachability table according to the net graph.
- The thus modeled traffic light, however, does not react in the way it actually should. Please describe which unwanted situations might occur (either in colloquial language or with the help of the reachability table and, in this case, also give reasons for what you suggest.

4 + 6 = 10 Points

Exercise 18: I am still waiting at the traffic light ...

In the previous exercise we have not been able to find a satisfactory solution for the problem with the traffic light. So we are again taking up the scene as it has been described above. Our next suggestion is the following:



- Which problem of the net graph from exercise 17 has been solved now?
- However, the traffic light still does not function as it should according to the information given in exercise 17. Please describe (using colloquial language and giving reasons for what you suggest) which unwanted situations may still or may now, as a result of the changed conditions, occur.
- Please modify the net graph in a way that it describes the correct function of the traffic light as it has been asked in exercise 17 (please make a sketch!).

2 + 4 + 4 = 10 Points