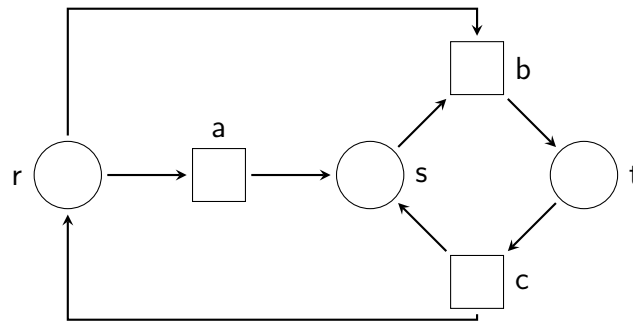# Formal Models SS 2018: Assignment 7

Institute for Formal Models and Verification, JKU Linz

Due 17.05.2018

To indicate that you solved an exercise and that you can present it in the exercise group, tick it off in our MOODLE course until **8am on the day of the exercise**. Unmarking and marking exercises at the begin of the exercise class is **not** possible.

Exercise 25

Given CEN N as shown above.

a) Specify N formally as 4-tupel $N = (C, I, E, G)$ including all of its components.

b) How many different markings are possible in N *theoretically*?

c) For *each* possible marking m of N, determine the set of *all* events which can fire in m.

d) Given marking $\{r, s\}$, what is the marking obtained when event b fires?

e) Given marking $\{t\}$, what is the marking obtained when event c fires?

Exercise 26

Let L be the LTS corresponding to the CEN N from Exercise 24. Draw L. Can a deadlock be reached on N? Justify your answer!

Exercise 27

Given PTN N as shown on the right. Justify your answers to the following questions.

a) Specify N formally as 5-tuple $N = (P, I, T, G, C)$ including all of its components.

b) How many different markings are possible in N *theoretically*?

c) Is there a marking M for N such that all transitions are enabled?
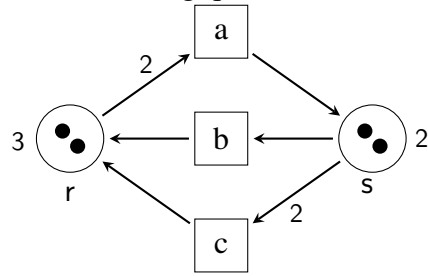
Exercise 28

Let $N = (P, I, T, G, C)$ be a PTN specified by the following sets:
$P = \{r, s\}$, $I = \{(r, 1), (s, 2)\}$, $T = \{a, b, c\}$,
$G = \{(r, a), (r, b), (a, s), (b, s), (s, c), (c, r)\}$,
$C = \{(r, 3), (s, 2)\} \cup \{(r, a, 1), (r, b, 1), (a, s, 2), (b, s, 1), (s, c, 2), (c, r, 1)\}$

- Draw N. How many different markings are possible on N *theoretically*?

- Draw the LTS corresponding to N.