

Formal Models SS 2015: Assignment 7

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Due 21.05.2015

Exercise 25

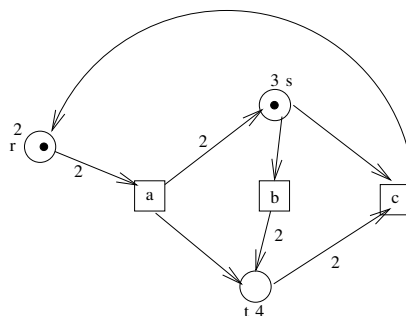
Let $N = (C, I, E, G)$ be the following CEN:

$C = \{r, s, u, v, w, x\}$, $I = \{r, u, w\}$, $E = \{b, c, d, e\}$,

$G = \{(r, b), (b, s), (s, c), (c, r), (c, u), (u, b), (b, v), (v, d), (d, x), (x, e), (e, w), (w, d)\}$

- Draw N . How many markings for N are possible *theoretically*?
- Let M be a marking of N with $M = \{r, s, u\}$. Which are the events that can fire in M ? What are the possible new markings obtained from this?
- Let M be a marking of N with $M = \{r, u, v, w\}$. Which are the events that can fire in M ? What are the possible new markings obtained from this?
- Let M be a marking of N with $M = \{s, u, x\}$. Which are the events that can fire in M ? What are the possible new markings obtained from this?
- Draw the LTS corresponding to N .

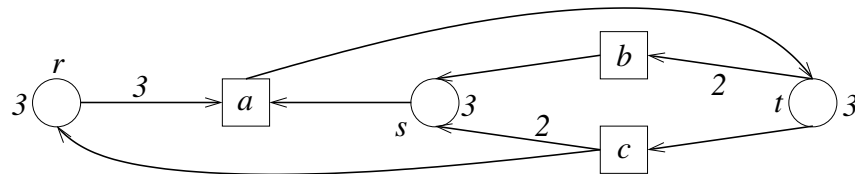
Exercise 26 Let N be the PTN shown below.



- Specify N formally as a 5-tuple $N = (P, I, T, G, C)$. How many markings for N are possible *theoretically*?

- Now let M be a marking of N with $M(r) = 0, M(s) = 1, M(t) = 2$. Which are the transitions that can fire in M ? What are the possible new markings obtained from this?
- Is there a marking for N so that all transitions are enabled? Justify your answer!

Exercise 27



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

- How many different markings are possible in N *theoretically*?
- Given markings $M_1 = \{(r, 1), (s, 3), (t, 1)\}$, $M_2 = \{(r, 1), (s, 2), (t, 1)\}$, $M_3 = \{(r, 2), (s, 2), (t, 1)\}$ and $M_4 = \{(r, 2), (s, 1), (t, 1)\}$. Determine the set of all transitions which are enabled in M_1 , M_2 , M_3 and M_4 , respectively.
- Given marking $M = \{(r, 2), (s, 1), (t, 2)\}$. For all transitions t enabled in M , determine marking M' obtained from firing t in M .

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 .