Formal Models SS 2016: Assignment 5

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Due 21.04.2016

Exercise 17 Let $P = b.c.P$ and $Q = a.b.Q$. Show that action

$$((b.Q + b.a.Q) \mid\mid (b.P + b.c.P)) + (a.Q \mid\mid b.P) \xrightarrow{b} a.Q \mid\mid P$$

can be executed by subsequently applying the semantical rules of PA.

Exercise 18

Given a CEN $N = (C, I, E, G)$ with $C = \{r, s, t, u, v, w\}$, $I = \{r, v\}$, $E = \{b, c, d, e\}$, $G = \{(r,b), (b,s), (t,b), (s,c), (c,r), (d,t), (d,u), (u,e), (e,v), (v,d), (w,b), (d,w)\}$.

Draw the CEN N. How many markings are possible on N *theoretically*?

a) Draw the CEN N.

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

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

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

Exercise 19

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

Exercise 20 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?