Formal Models SS 2018: Assignment 5

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Due 26.04.2018

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 17

Draw the LTS for PA system $P = Q \,||\, R \,||\, S \,||\, T, Q = a.b.Q, R = b.c.R, S = d.c.S, T = a.c.T$

Exercise 18

Given the the PA system $P = Q \,||\, R$, with $Q = a.s.Q + b.s.Q$, and $R = s.R + s.c.R$. Draw the LTS defined by P. Further show that action $((s.Q + a.s.Q) \,||\, R) + (s.Q \,||\, (c.s.R + s.R)) \xrightarrow{s} Q \,||\, R$ can be executed by subsequently applying the semantical rules of PA.

Exercise 19

Let $P = Q \,||_\Theta R$ where Q and R are $Q = a.b.t.Q$, $R = d.t.R + c.R$. Let $\Sigma = \Sigma(P) = \Sigma(Q) \cup \Sigma(R) = \{a, b, c, d, t\}$. Draw the LTS for $P = Q \,||_\Theta R$ where...

1. ... $\Theta = \{b, t\} \subseteq \Sigma$.
2. ... $\Theta = \{b, c\} \subseteq \Sigma$.

Exercise 20

Consider rule $R_{||}$ for the parallel comosition of an arbitrary number of processes (lecture slide 26). Explain why condition $\exists P_i \quad P_i \xrightarrow{a} P_i'$ is required. Justify your answer in detail. Illustrate by means of a small concrete example the semantical effects of dropping this condition form the definition of $R_{||}$.