Formal Models SS 2012: Assignment 4

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Exercise 13

   a) Draw the LTS for PA system $P = a.c.Q + a.(b.P + c.P)$, $Q = a.c.P + b.P$.

   b) Draw the LTS for PA system $P = Q \,||\, R$, $Q = a.b.s.Q$, $R = c.s.R$.

Exercise 14

Draw the LTS for PA system $P = b.(b.R + a.Q)$, $Q = c.a.Q + b.R$, $R = b.P + b.c.R$. As demonstrated in the lecture, show that action $Q \xrightarrow{b} R$ can be executed by subsequently applying the semantical rules of PA.

Exercise 15

Like Exercise 14, but for PA system $P = Q \,||\, R$, $Q = a.b.t.Q$, $R = d.t.R + c.R$ and action $P \xrightarrow{c} P$.

Exercise 16

Let $A = coin.(tea.A + coin.coffee.A)$ and $B = coin.tea.B + coin.coin.coffee.B$ be PA systems modelling two versions of a simple beverage vending machine. Justify your answers in the following.

   a) Draw the LTS for A and B.

   b) Interpret A and B as finite automata A_{FA} and B_{FA}, assuming that the initial state is the only final state. Is $L(A_{FA}) = L(B_{FA})$?

   c) Does the behaviour of A and B differ from the perspective of a user when buying a drink?