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Formal Foundations of Information Systems
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6. Exercise Set: Petri Nets: P/T Nets

Exercise 22 (Modellierung von S/T-Netzen, 3 Punkte)

Given the model for the 3-philosopher's problem discussed in the lecture, model the 4-philosopher's problem. Provide your result both graphically and through formal declaration of the defining quintuple $N = (S, T, F, V, m_0)$

Exercise 23 (Modellierung von S/T-Netzen, 3 Punkte)

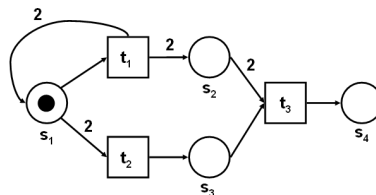
Model the following *Handshaking* protocol as a P/T Petri Net:

Two processes P_1 and P_2 mutually exchange messages. P_1 is the sender and P_2 the receiver. After P_1 has sent a message to P_2 , he changes into the state *Ready_to_Receive* and waits for an acknowledgement *ACK* of the receipt by P_2 . After the receipt of the acknowledgement he can send more messages.

P_2 starts in state *Waiting_for_Messages*. If he receives a message, he confirms the receipt by sending an acknowledgement *ACK* message to P_1 and waits for more messages.

Exercise 24 (Erreichbarkeit in S/T-Netzen, 2+1+2=5 Punkte)

Consider the P/T Petri Net below.



- Provide for all transitions t_i the vectors t_i^+ , t_i^- , and Δt_i , as well as the current marking m .
- Check if the string $t_1 t_2 t_3 \in W(T)$ is contained in $L_N(m)$ using the vectors from part a).

- Let $m' := \begin{pmatrix} 0 \\ 2 \\ 0 \\ 2 \end{pmatrix}$. Find all $q \in W(T)$ such that $m[q > m'$ holds

Exercise 25 (Erreichbarkeit in S/T-Netzen, 2 Punkte)

Let $q := t_1 \dots t_n \in W(T)$ und $\Delta q := \sum_{i=1}^n \Delta t_i$. Show that $m[q > m' \Leftrightarrow m' = m + \Delta q$ holds or give a counter example.

Due by: 30.06.2009