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Exercises
Distributed Systemes: Part 2
Summerterm 2012
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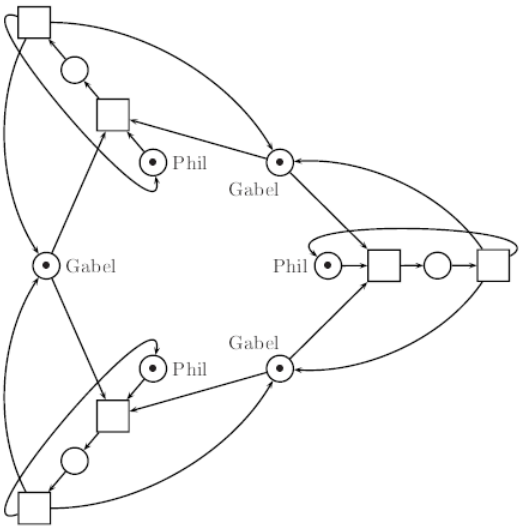
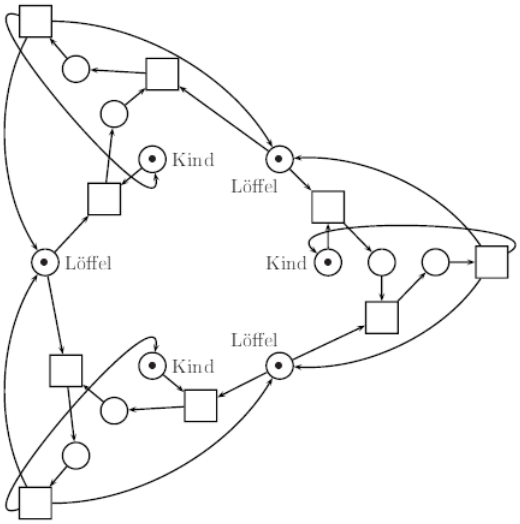
7. Exercise sheet: Petri nets

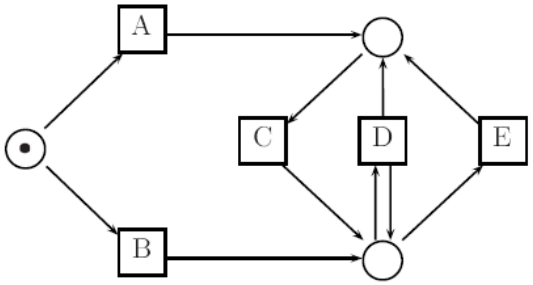
Exercise 1
Consider the following 2 elementary System-Nets:



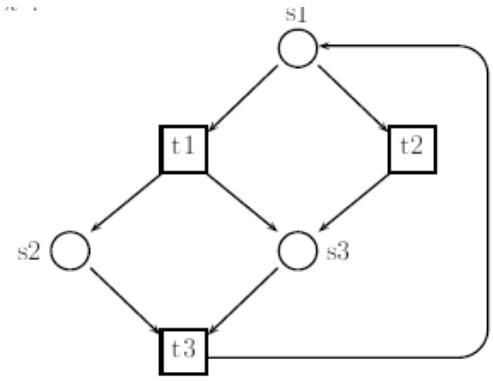


Discuss similarities and differences.

Exercise 2
Give the coverability graph of the following net. First construct the auxiliary tree.

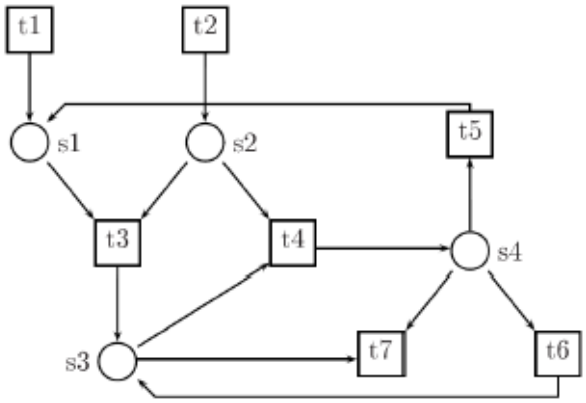


Exercise 3
Consider the following net:



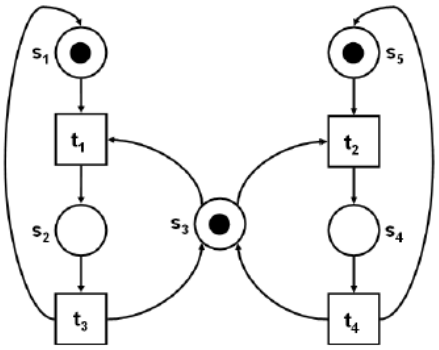
Does there exist an initial marking m_0 such that the net is life in m_0? Justify your answer.

Exercise 4
Consider the following net.



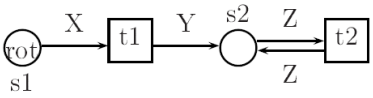
Compute all T- and P-invariants and decide, whether or not the net is covered.

Exercise 5
Consider the following net.



Compute all T- and P-invariants. What kind of interesting conclusions can you make?

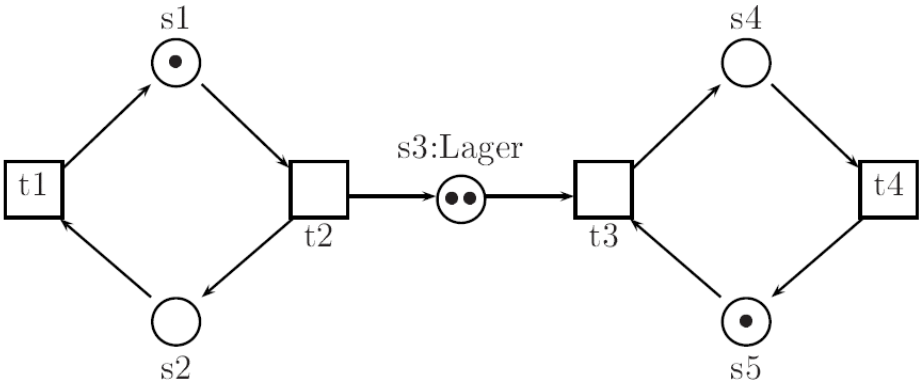
Exercise 6
Consider the following colored System-Net.



$$
\begin{aligned}
C(s_1) &= \{rot\} \\
C(s_2) = C(t_1) = C(t_2) &= \{blau, gelb\} \\
X(blau) = X(gelb) &= rot \\
Y(blau) &= 2 \cdot blau + gelb \\
Y(gelb) &= 3 \cdot gelb \\
Z(blau) &= blau \\
Z(gelb) &= gelb
\end{aligned}
$$

Unfold the net.

Exercise 7
Consider the following colored System-Net.



Fold the net such that it contains only one place and only one transition.