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LEHRSTUHL FÜR INFORMATIK II
RWTH Aachen · D-52056 Aachen
http://www-i2.informatik.rwth-aachen.de/

Prof. Dr. Ir. J.-P. Katoen
T.Han, I.Zapreev

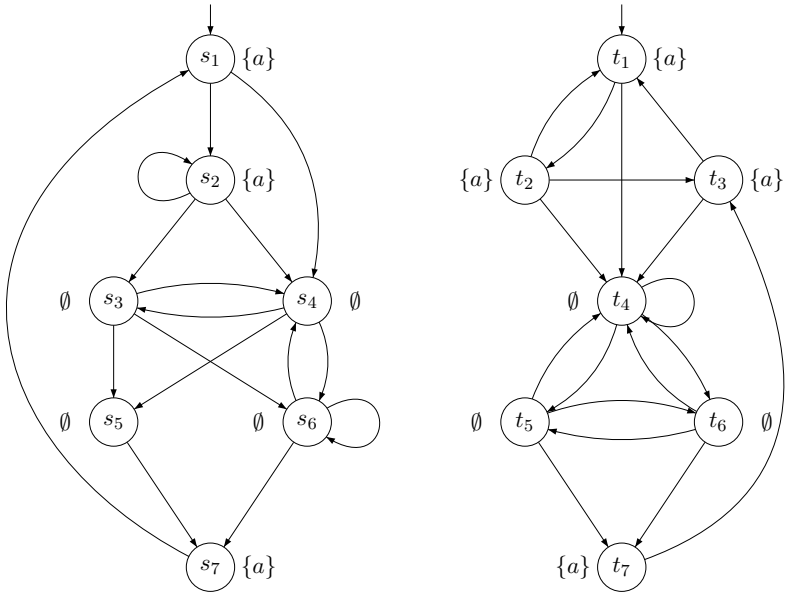
Exercises to the lecture *"Advanced Model Checking"*, winter term 2006

– Assignment 4 –

The solutions are collected on Nov. 17th at the beginning of the exercise class.
Justify your answers!

Exercise 1 (4 points)

(a) Given transition systems TS_1 and TS_2, determine whether $Traces(TS_1) = Traces(TS_2)$.

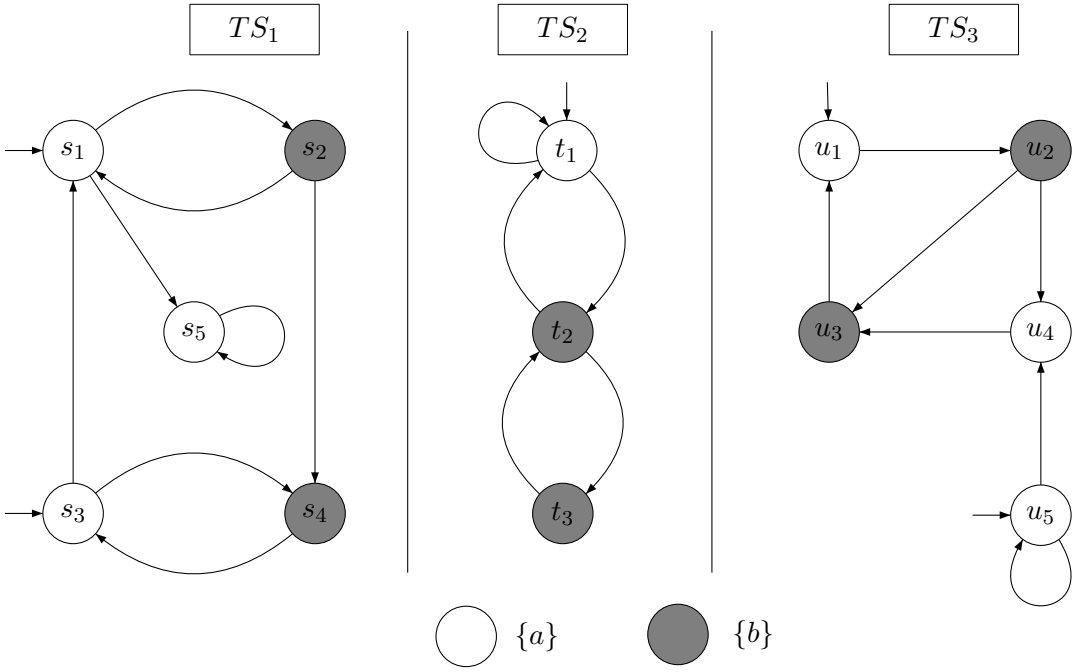


TS_1 TS_2

(b) Provide two transition systems TS'_1 and TS'_2 such that $Traces_{fin}(TS'_1) = Traces_{fin}(TS'_2)$, but $Traces(TS'_1) \neq Traces(TS'_2)$.

Exercise 2 **(5 points)**

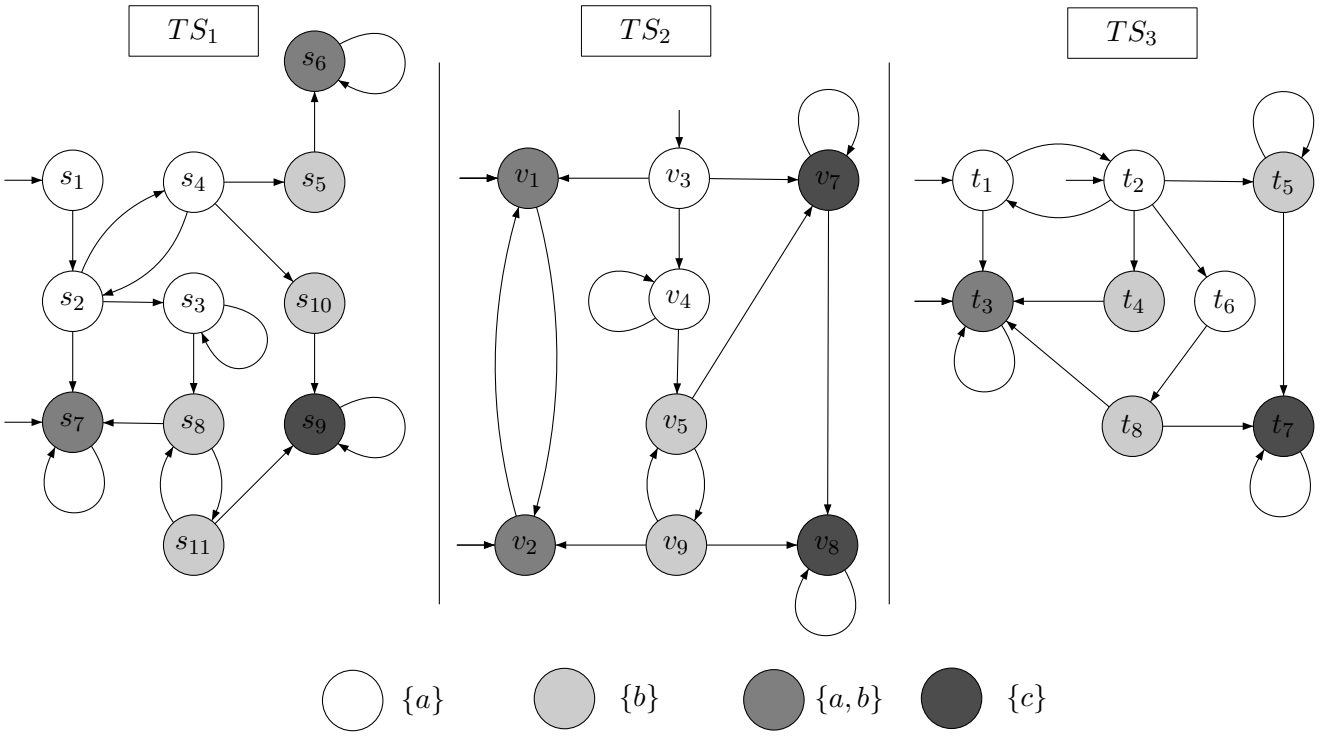
Consider three transitions systems given on the next Figure:



For each $i, j \in \{1 \dots 3\} \times \{1 \dots 3\}$, $i \neq j$, determine whether $TS_i \cong TS_j$, $TS_i \sqsubseteq TS_j$ or $TS_i \not\sqsubseteq TS_j$. Justify your answer.

Exercise 3 (5 points)

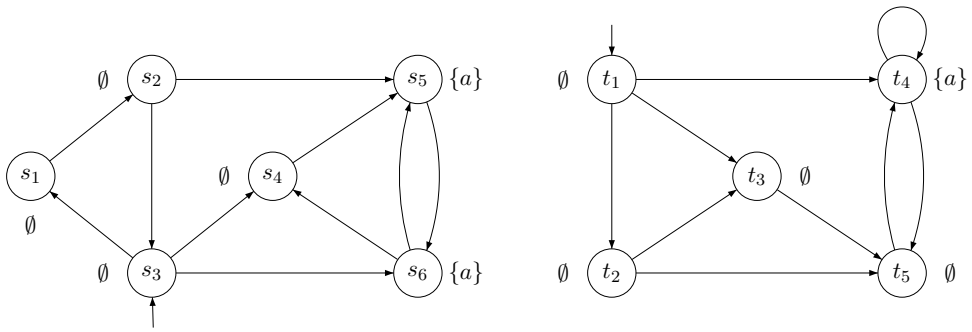
Consider three transitions systems given on the next Figure:



For each $i, j \in \{1 \dots 3\} \times \{1 \dots 3\}$, $i \neq j$, determine whether $TS_i \approx TS_j$ or $TS_i \not\approx TS_j$. Justify your answer.

Exercise 4 (4 points)

Given two transition systems TS_1 and TS_2 as follows:



(a) Is $TS_1 \approx TS_2$? If so, construct $(TS_1 \oplus TS_2)/\approx$. If not, justify your answer.

(b) Is $TS_1 \cong TS_2$? If so, give the proof. If not, provide a LTL$\setminus_{\bigcirc}$-formula that can distinguish them.