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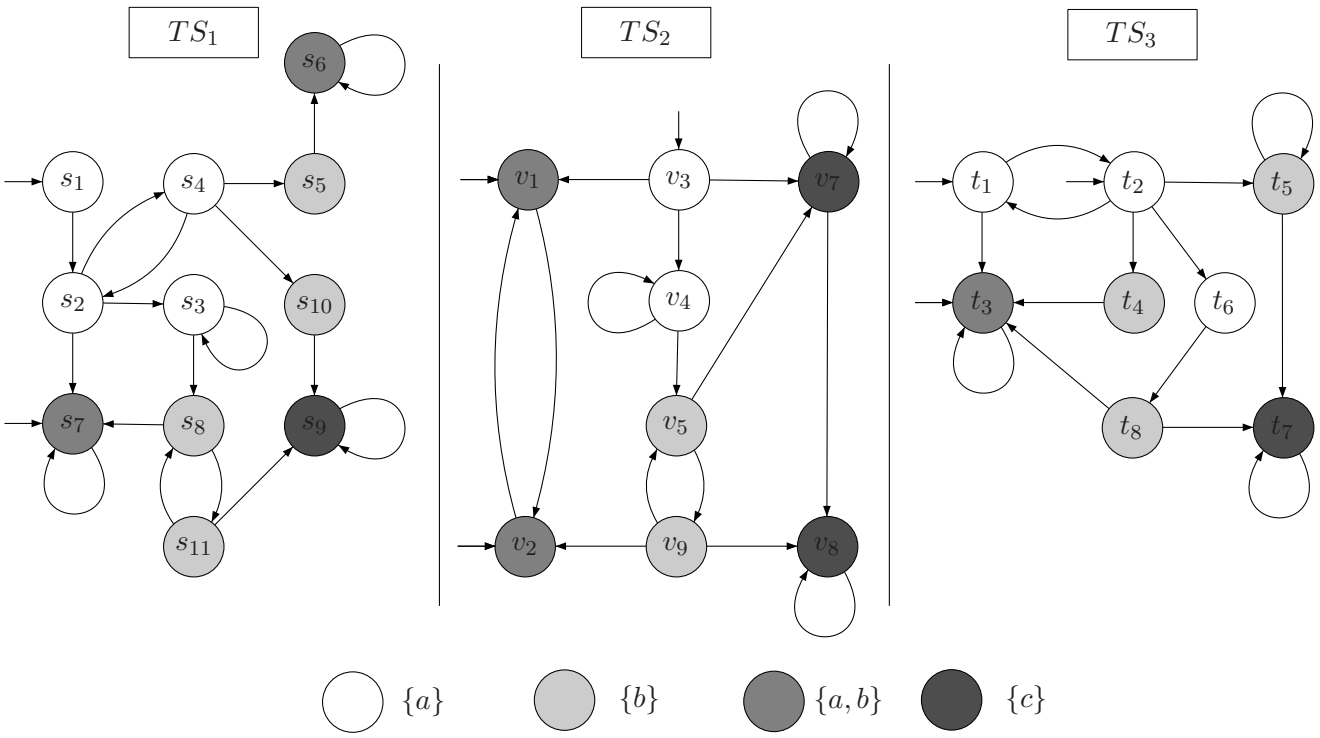
Advanced Model Checking
Summer term 2014

– Series 3 –

Hand in on May 14'th before the exercise class.

Exercise 1 (3 points)

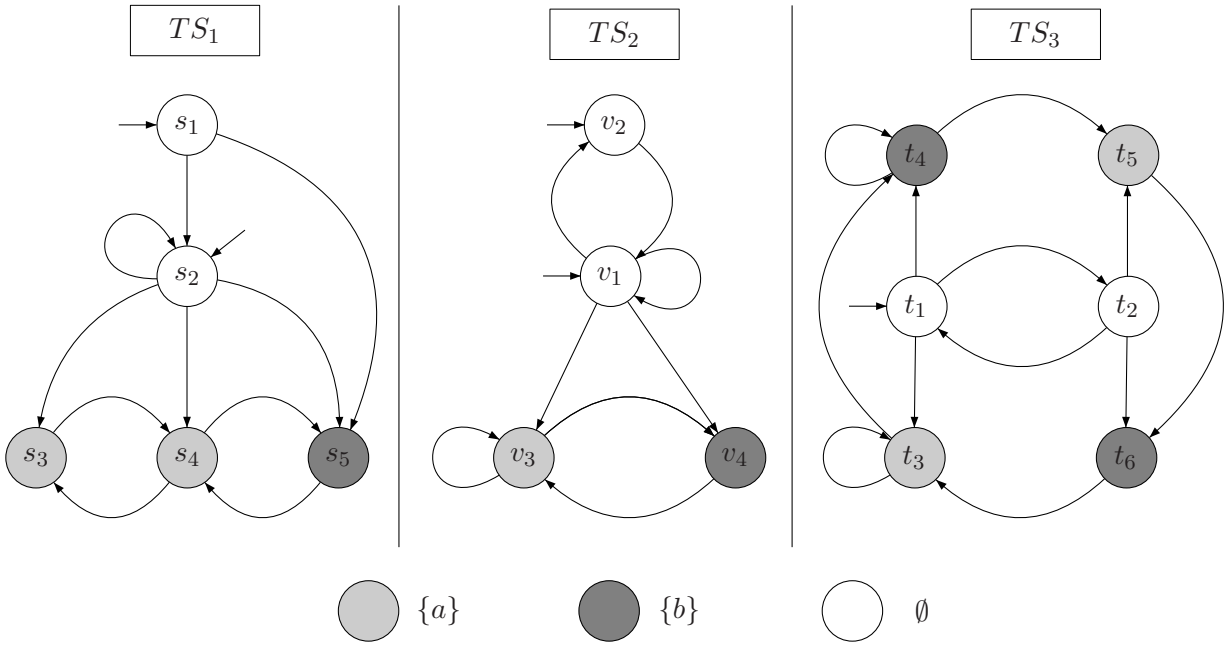
Consider three transitions systems given on the next Figure:



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 2 (3 points)

Consider the transition systems TS_1 , TS_2, TS_3 over $AP = \{a, b\}$ shown in the following figure:



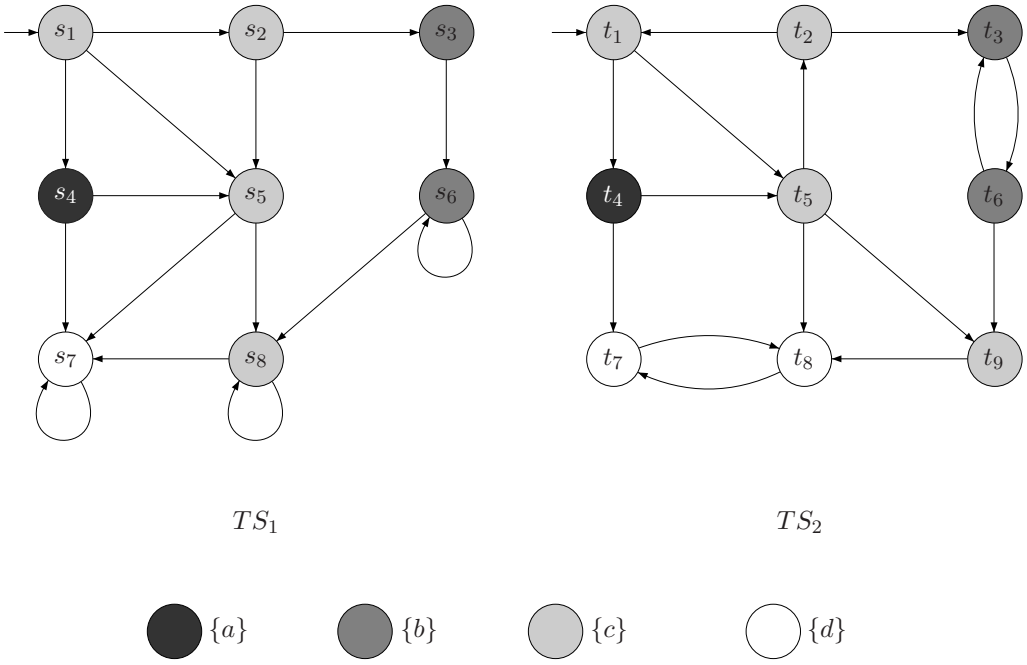
Questions:

(a) for each $i, j \in \{1 \dots 3\} \times \{1 \dots 3\}$, $i \neq j$, determine whether $TS_i \preceq TS_j$

(b) for each case $TS_i \not\preceq TS_j$, give a $\forall\text{CTL}_{\setminus \mathsf{U}}$ - formula that distinguishes TS_i and TS_j.

Exercise 3 (4 points)

Given transition systems TS_1 and TS_2 as follows:



Does it hold that:

(a) $TS_1 \approx TS_2$?

(b) $TS_1 \approx^{div} TS_2$? If not, provide a CTL$\setminus_{\bigcirc}$ formula to distinguish them.