

Advanced Model Checking Winter term 2010/2011

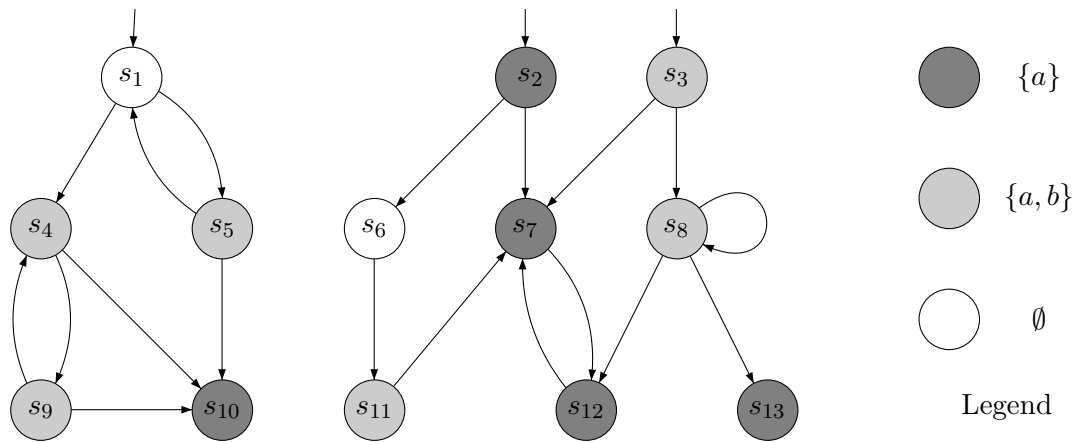
– Series 2 –

Hand in on November 10'th before the exercise class.

Exercise 1

(3 + 3 points)

Consider the transition system TS over $AP = \{a, b\}$ shown in the figure below:



Questions:

Determine the bisimulation quotient system $TS/\sim$ by using

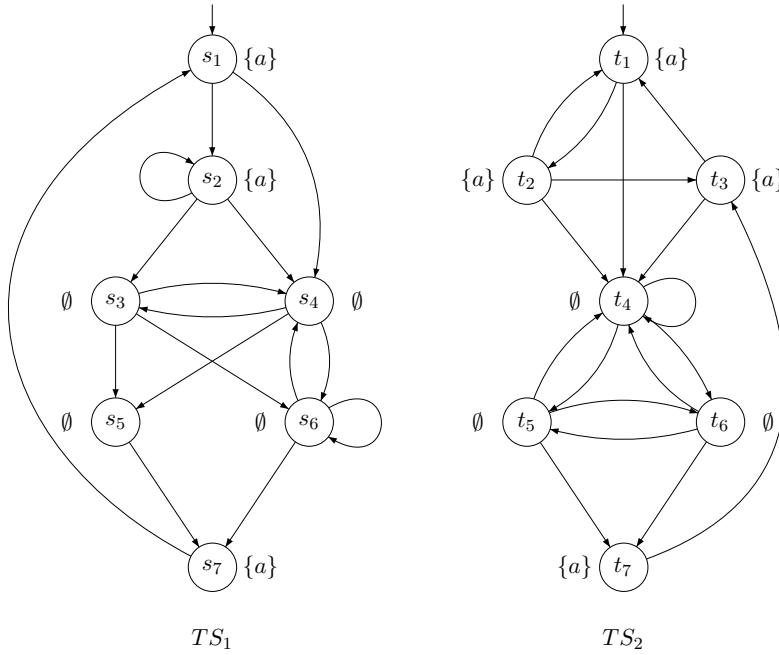
- (i) Kanellakis-Smolka algorithm
- (ii) Paige-Tarjan algorithm

Sketch the first four (outer) iteration steps respectively, if they exist.

Exercise 2

(1 + 1 points)

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

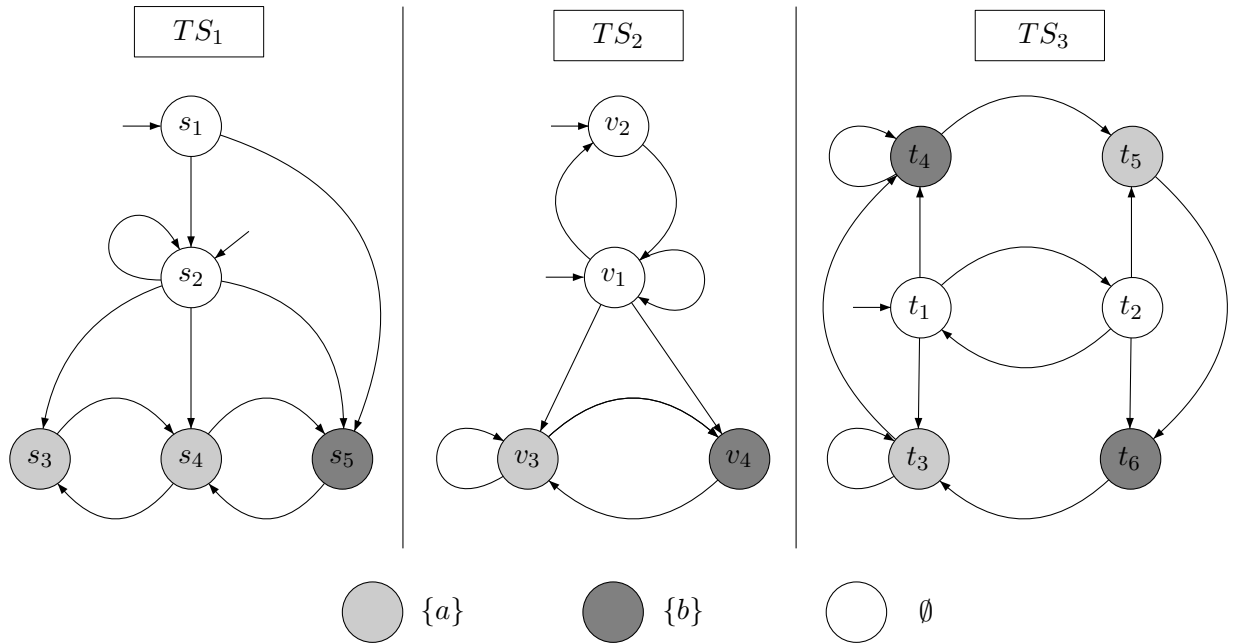


- (b) Provide two transition systems TS'_1 and TS'_2 such that $Traces_{fin}(TS'_1) = Traces_{fin}(TS'_2)$, but $Traces(TS'_1) \neq Traces(TS'_2)$.

Exercise 3

(1 + 1 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 $\forall\text{CTL}_{\setminus \cup}$ - formula that distinguishes TS_i and TS_j .