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

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

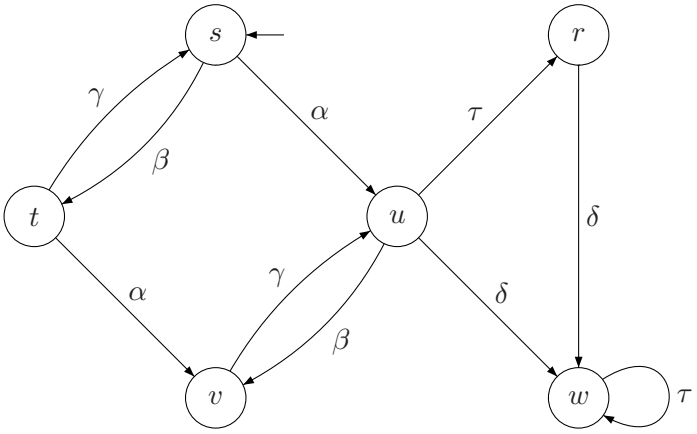
Exercises to the lecture *"Advanced Model Checking"*, winter term 2006

– Assignment 7 –

The solutions are collected on Dec. 8th at the beginning of the exercise class.

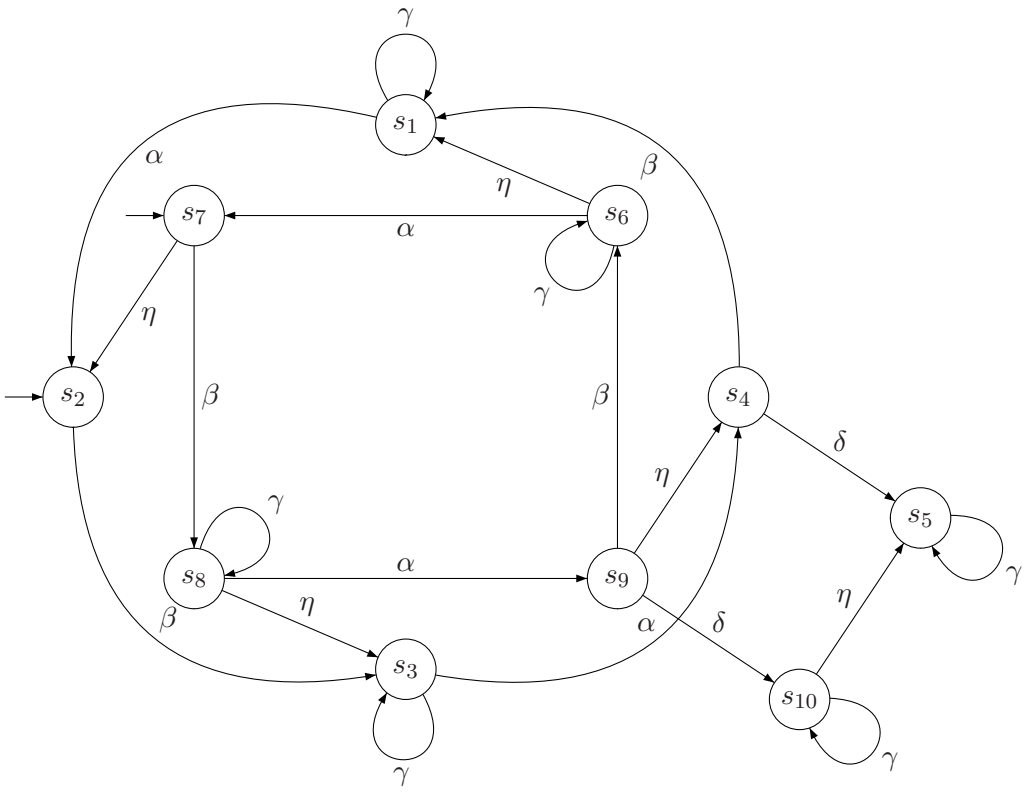
Exercise 1 (4 points)

Given a transition system TS in the following figure with action set $Act = \{\alpha, \beta, \gamma, \delta, \tau\}$. Determine the pairs of independent actions.



Exercise 2 **(8 points)**

Consider the transition system below:



The states labeling is as follows:

- $L(s_{10}) = \emptyset$
- $L(s_6) = L(s_7) = \{a\}$
- $L(s_3) = L(s_4) = L(s_5) = L(s_8) = L(s_9) = \{b\}$
- $L(s_1) = L(s_2) = \{a, b\}$

Prove or disprove that each of the following *ample sets* satisfy requirements *A1* through *A3* on the *ample sets*, also check whether the requirement *A4* holds:

- $ample(s_6) = \{\gamma, \alpha\}$
- $ample(s_7) = \{\beta\}$
- $ample(s_8) = \{\alpha\}$
- $ample(s_9) = \{\alpha, \beta, \delta\}$
- $ample(s_{10}) = \{\gamma, \eta\}$

In case some of the conditions *A1* through *A4* do not hold, modify the *ample sets* in an appropriate way to fix it. Clarify your changes.