RHEINISCH-
WESTFÄLISCHE
TECHNISCHE
HOCHSCHULE
AACHEN

LEHRSTUHL FÜR INFORMATIK 2
RWTH Aachen · D-52056 Aachen
http://www-i2.informatik.rwth-aachen.de/

Prof. Dr. Ir. J.-P. Katoen
A. Mereacre & H. Yue

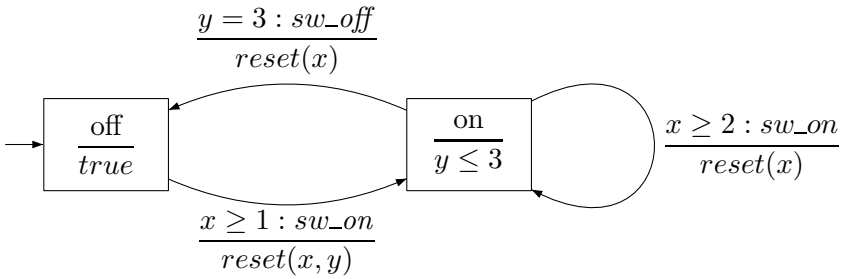
Advanced Model Checking
Summer term 2009

– Series 10 –

Hand in on July 6'th before the exercise class.

Exercise 1 (4 = 3 + 1 points)

For the timed automaton *LightSwitch* for the light switch illustrated below,

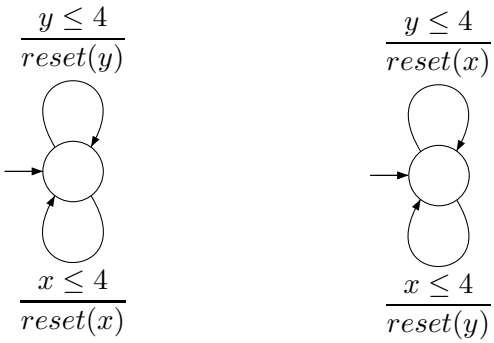


(a) Determine the region transition system $RTS(LightSwitch, true)$.

(b) Check whether *LightSwitch* is timelock-free and non-zeno.

Exercise 2 (2 = 1 + 1 points)

Consider the following two timed automata:

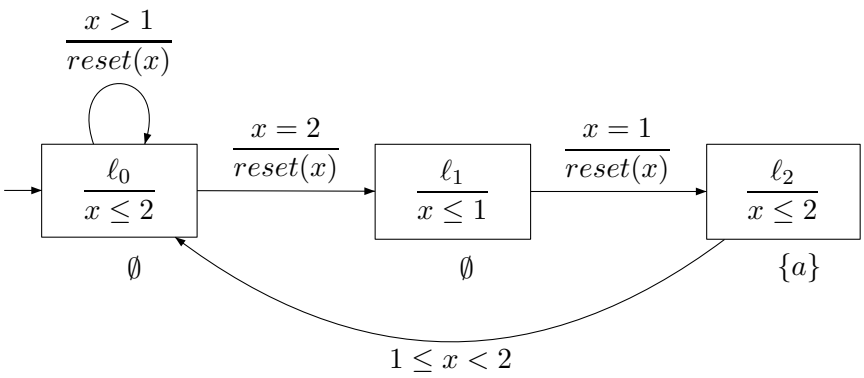


(a) (b)

As these timed automata have a single location only, the *state* of these timed automata can be considered as just a point in the real plane. A point (d, e) (with $d, e \geq 0$) thus represents that clock x has value d and clock y has value e. Determine the reachable state space of each of these timed automata. Justify your answers.

Exercise 3 (4 = 1 + 3 points)

Given the following timed automata TA:



Questions:

(a) Determine the set of states $Sat(\exists \Diamond^{\leq 4} a)$.

(b) Determine the region transition system $RTS(TA, true)$.