

Advanced Model Checking Summer term 2009

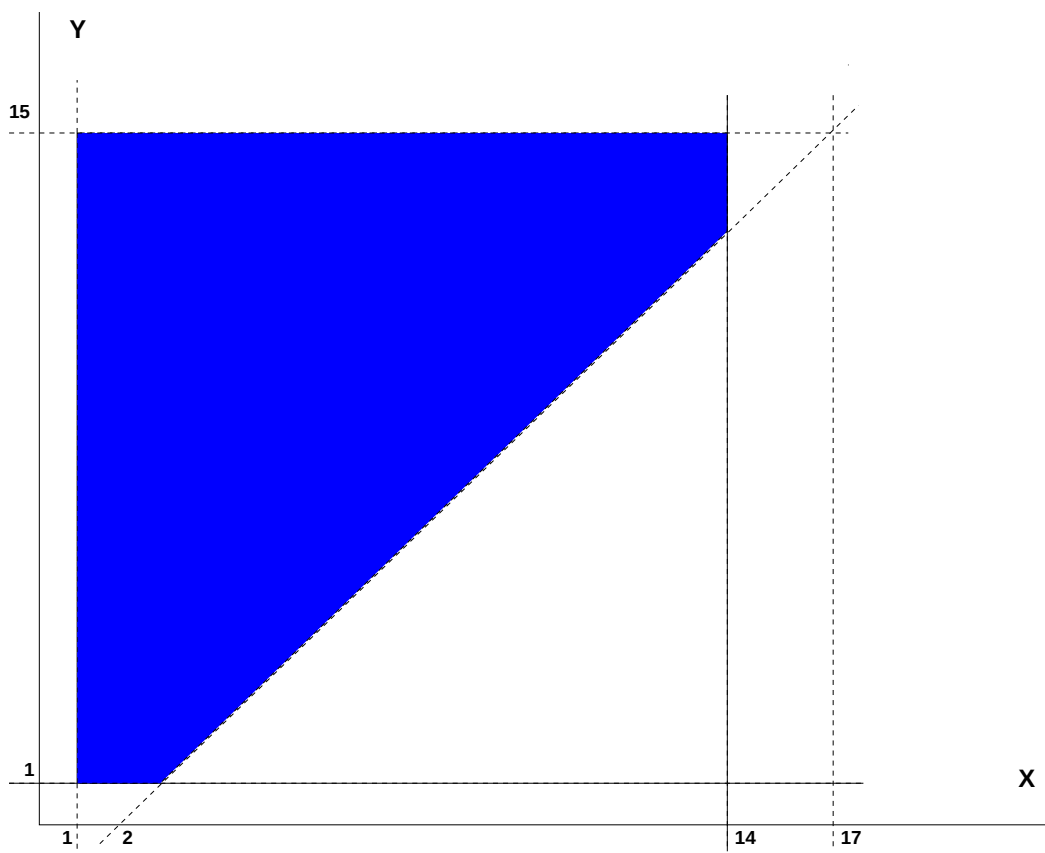
– Series 11 –

Hand in on July 13'th before the exercise class.

Exercise 1

(1 + 1 = 2 points)

Given the zone Z on the picture below:



Compute the successor and predecessor of Z given:

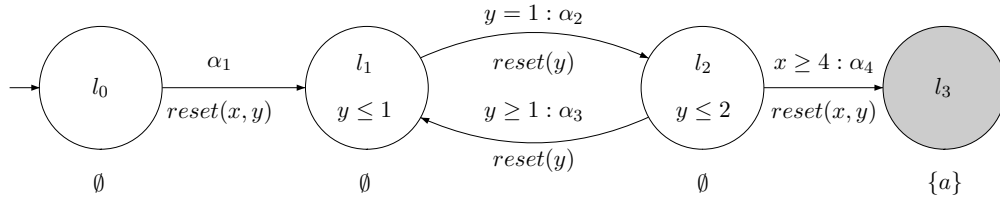
- Guard $g := x \leq 10 \wedge y > 2 \wedge -7 \leq x - y$.
- Reset $D := \{x\}$.

Provide all intermediate steps.

Exercise 2

(2 × 3 = 6 points)

Given a timed automaton TA as follows:



- Determine its zone automaton without normalization;
- Determine its zone automaton with normalization;
- Given a TCTL formula $\Phi = \exists \Diamond^{<5} a$, check $TA \models_{TCTL} \Phi$ on the zone automaton.

Exercise 3

(0.5 × 4 = 2 points)

For the zone defined by:

$$1 \leq x \wedge y \leq 15 \wedge -7 \leq x - y \leq 2$$

- Compute the DBM.
- Compute the canonical form of the DBM.
- Reset $y := 3$ in the DBM.
- Normalize the DBM with respect to:

$$C_0 = 0, C_x = 10, C_y = 8$$