

Exercises to the lecture “Advanced Model Checking”, winter term 2006

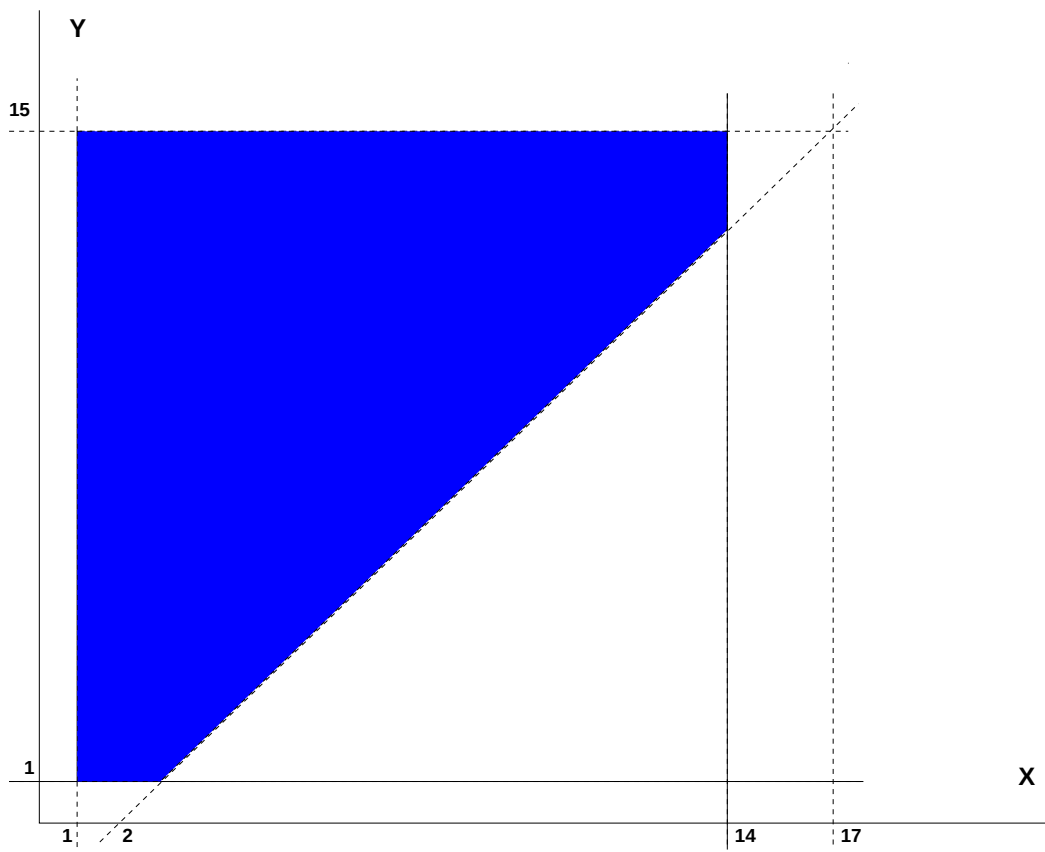
– Assignment 11 –

The solutions are collected on Jan. 26th at the beginning of the exercise class.
Justify your answers!

Exercise 1

(4 points)

Given the zone Z on the picture below:



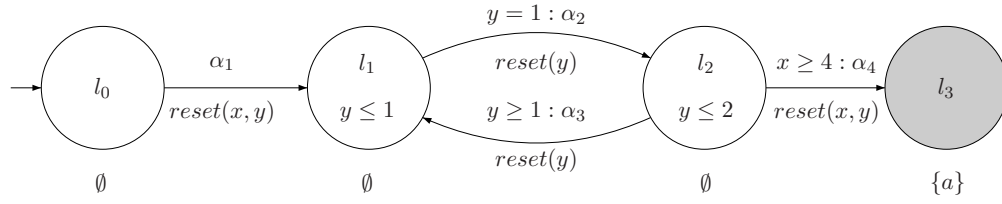
Do the following:

- Reset x in Z .
- Compute $Z \wedge x \leq 10 \wedge y > 2 \wedge -7 \leq x - y$.
- Give $Z^\uparrow$.

Exercise 2

(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

(4 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:

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