

## Verification

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### Problem 1: TCTL [4 Points]

a) Prove or disprove the equivalence of the following TCTL formulas:

$$AF^{=d} \Phi \wedge AF^{=d} \Psi = AF^{=d} (\Phi \wedge \Psi),$$

where  $F^{=d} = F^{[d,d]}$  for  $d \in \mathbb{R}_{\geq 0}$ .

b) Does this equivalence hold if we replace  $F^{=d}$  by  $F^J$  for  $J = [0, \infty)$ ? Justify your answers!

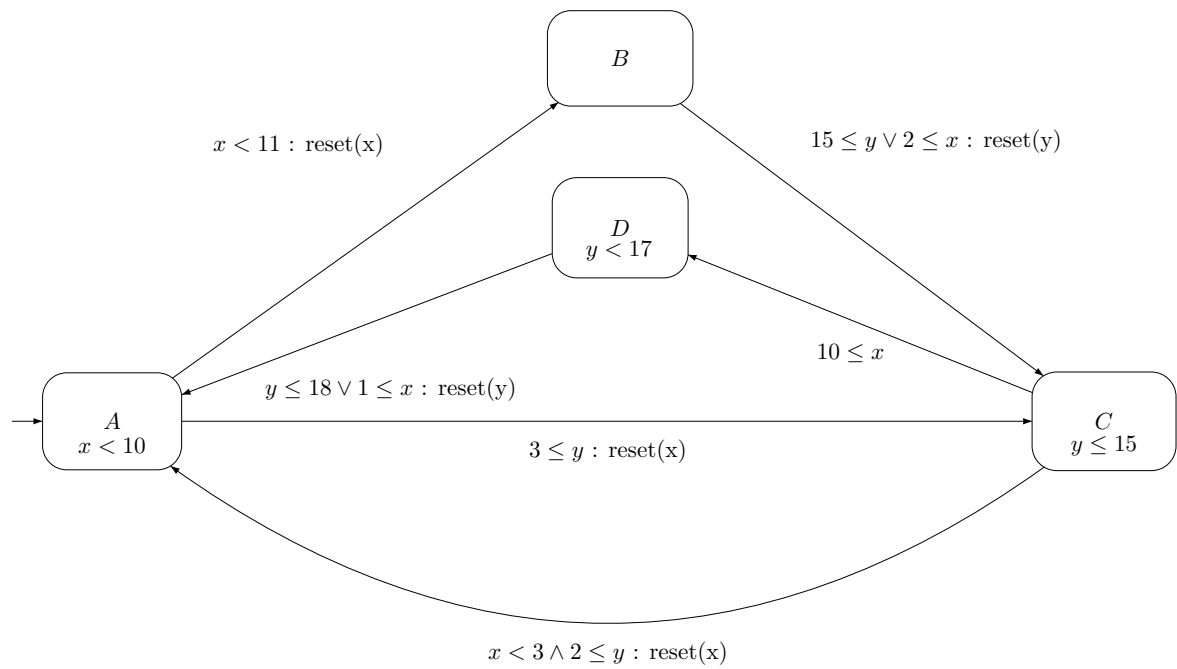
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The following exercises belong to the afternoon session.

### Problem 2: Timed-Automata [4 Points]

For the Timed-Automata below check whether it is:

- a) Non-Zeno.
- b) Timelock-free.



Justify your answers!

### Problem 3: DBM [3 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.