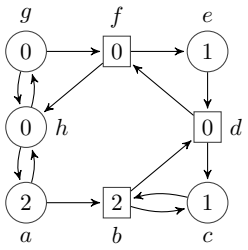
Applied Automata Theory (WS 2013/2014) Technische Universität Kaiserslautern

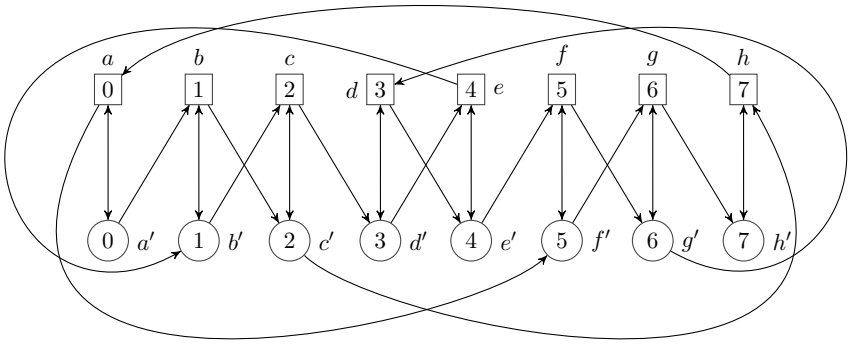
Exercise Sheet 12

Jun.-Prof. Roland Meyer, Georgel Calin Due: Tue, Jan 28

Exercise 12.1 Parity Game Determinacy

Use the McNZSolver procedure from class to solve the parity games from last week:





Exercise 12.2 Parity Tree Automata

Let $\Sigma = \{a/2, b/2, c/2\}$. Give Parity Tree Automata for each of the languages below:

(a) $L_1 = \{t \in \mathcal{T}_\Sigma^\omega \mid t = a(b(t,t), b(t,t))\}$,

(b) $L_2 = \{t \in \mathcal{T}_\Sigma^\omega \mid t(\epsilon) = a \text{ and } \forall x : t(x) = a \Rightarrow t(x110) = a \wedge t(x001) = a\}$,

(c) $L_3 = \{t \in \mathcal{T}_\Sigma^\omega \mid \text{for every path } \sigma \text{ of } t : \infty\text{-many } a\text{'s on } \sigma \Rightarrow \infty\text{-many } b\text{'s on } \sigma\}$,

(d) $L_4 = \{t \in \mathcal{T}_\Sigma^\omega \mid \text{there are finitely many } a\text{'s on every path of } t\}$.

Which of the above languages are recognised by deterministic Parity Tree Automata?
Note: deterministic PTAs are strictly less powerful than nondeterministic PTAs.