Formal Models SS 2020: Assignment 9

Based on Video "Lecture 22. May 2014" on our webpage.
Institute for Formal Models and Verification, JKU Linz

due 04.06.2020

Guideline:

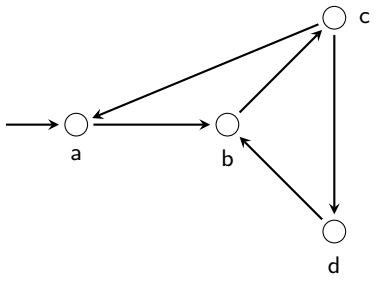
- To indicate that you solved an exercise, tick it off in our MOODLE course until **10am on the day of the exercise (04.06.2020)**. Unmarking and marking exercises later is **not** possible.
- **Upload your solved exercises in the Moodle course. Generate a single PDF file, which contains all solved exercises, your name, and your matriculation number. Upload the PDF file - do not generate a ZIP!** Not following the format leads to deduction of points!
- We will randomly select and correct solved exercises.
- A sample solution will be provided.

Exercise 33

Given LTS L as shown on the right.

a) List 5 different infinite traces in L, using ω-notation, e.g. $ababab\cdots = (ab)^{\omega}$.

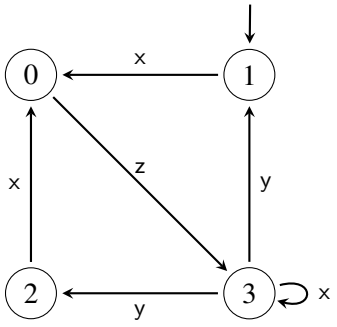
b) Find 6 equivalences between traces from part a), using notation π^i, e.g. $\pi_2 = \pi_1^1$ for $\pi_1 = xyz$ and $\pi_2 = yz$.



Exercise 34

Given LTS L and CTL/HML formulae 1 to 6 as shown below. For each state s of L, determine which of formulae 1 to 6 hold in s.

1. $\mathbf{EX}(\langle x\rangle\, 1)$
2. $\mathbf{AX}([y]\, 0)$
3. $\mathbf{AG}(\langle z\rangle\, 1 \rightarrow \langle y\rangle\, 1)$
4. $\mathbf{E}[\langle x\rangle\, 1\ \mathbf{U}\ \langle z\rangle\, 1]$
5. $\mathbf{EG}(\langle y\rangle\, 1)$
6. $\mathbf{EF}(\mathbf{EG}\, \langle x\rangle\, 1)$



Exercise 35

Give a formal proof for the proposition on slide 60 (hint: use induction).

Exercise 36

Draw the Kripke structure for the LTS as shown below.