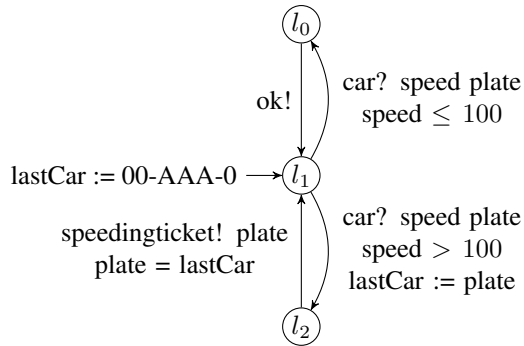


STAR Homework 6: Symbolic Transition Systems

Exercise 1 (HOMEWORK: STS) Write down the formal definition of the following graphical representation of an STS:

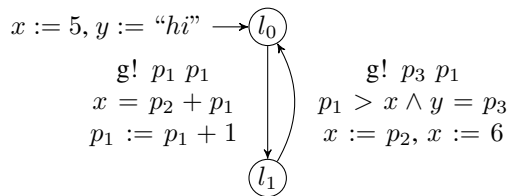


Note: exercise 4 is also part of the HOMEWORK.

Exercise 2 (STS definition violations) Recall that the following properties should hold for a well-defined LTS: for any switch $(l_1, \lambda, p_0 \dots p_k, \phi, \psi, l_2)$ of an STS, we require that:

1. $p_0 \dots p_k$ is a sequence of distinct variables
2. $\text{type}_g(\lambda) = \text{type}_t(p_0 \dots p_k)$
3. $\phi \in \mathcal{T}_{\text{Bool}}(\mathcal{V}_l \cup \{p_0, \dots, p_k\})$
4. $\psi \in \mathcal{T}(\mathcal{V}_l \cup \{p_0, \dots, p_k\})^{\mathcal{V}_t}$

Point out all the violations to these properties for the following STS:



Exercise 3 (On-the-fly test generation and execution) Write down an on-the-fly test generation and execution (similar to the slide with nr. 20 of the lecture on STS), for an SUT that is ioco-conforming to the specification of exercise 1. Make sure that the test generation and execution covers all 4 switches of the specification, in 4 execution steps.

Exercise 4 (HOMEWORK: Symbolic execution graph) Write down the symbolic execution graph of the STS of exercise 1, up to level 2, i.e. take any valid sequence of two switches from the initial state of the graph.