Formal Methods - 02_Modeling_Transistion_Systems

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material:
HANDOUTS : `http://disi.unitn.it/~rseba/DIDATTICA/fm2020/02_TRANSITION_SYSTEMS_HANDOUT.pdf`
SLIDES : `http://disi.unitn.it/~rseba/DIDATTICA/fm2020/02_TRANSITION_SYSTEMS_SLIDES.pdf`

1 Transistion Systems as Kripke Models

Kripke models are used to describe reactive systems:

1. nonterminating systems with **infinite** behaviours (ex. communication protocols, hw circuits);

2. represent the **dynamic evolution** of modeled systems;

3. a state includes values to state variables, program counters, content of communication channeles.

4. *can be animated and validated before their actual implementation*

Kripke model: formal definition

$$< S, I, R, AP, L >$$

1. S = a **finite** set of states

2. I = set of initial states

3. R = set of transisitions rules $R = S\dot{S}$

4. AP = set of boolean variables

5. L = labeling of the set and variable $L : S =\rightarrow 2^{AP}$

The set of transitions R is Total, every state has an outgoing link.
In Kripke structures the value of every variable is always assigned in each state.

2 Languages for Transition Systems

3 Properties of Transition Systems