1 Temporal Logic

Computational Tree Logic (CTL) is a temporal logic. It’s formula is defined inductively as follows.

$$\phi ::= T | F | \neg \phi | \phi \land \phi | \phi \lor \phi | \phi \rightarrow \phi | AX\phi | EX\phi | A[\phi U \phi] | E[\phi U \phi] | AG\phi | EG\phi | AF\phi | EF\phi$$

See Huth and Ryan [2, Ch. 3] for more details.

2 Model Checking

A mode $\mathcal{M}$ is defined as tuple $(S, F, L)$, where $S$ is a set of states, $F$ is a transition relation over the set states $S$, and $L$ is a labelling function

$$L : S \rightarrow P(A)$$

where $A$ is a set of atomic statements or propositions.

Model checking. Given a model $\mathcal{M} = (S, F, L)$, a state $s \in S$, and a CTL formula $\phi$. Model checking is the satisfaction problem

$$\mathcal{M}, s \models \phi.$$ 

Informally, it means the model $\mathcal{M}$ satisfies $\phi$ at the state $s$. See Huth and Ryan [2, Ch. 3 and 6] for more details.
3 Homework 4

Exercises 3.2 Problem 1 and 2. In addition, implement and verify in SMV. Submit the answers and the SMV code.

4 Bibliography Notes and Further Reading


References


