Static Program Checking

Dynamic systems in Alloy

Jun.-prof. Mana Taghdiri | May 23, 2014
Spanning Tree

Definition

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The “state” of the system changes. The state can be modeled in Alloy as:

- **Local State:**
  Makes each dynamic relation depending on an additional ordered type (Time)

- **Global State:**
  Introduces a state type (State) containing all (dynamic) relations

- In mathematical terms, almost the same:
  \[
  r \subseteq S_1 \times \cdots \times S_n \times Time
  \]
  \[
  r \subseteq State \times S_1 \times \cdots \times S_n
  \]
Ordering

For scope of $S$ equal to $n$ and

1. \texttt{/open util/ordering[S]}
2. \texttt{sig S \{ . . . \}}
3. . .

- Any interpretation of $S$ looks like:

  $S_1 \xrightarrow{\text{next}} S_2 \xrightarrow{\text{next}} \ldots \xrightarrow{\text{next}} S_n$

  $S/\text{first}$

  $S/\text{last}$

- Can avoid the use of Integers
- Increases the efficiency