Parsybone manual

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1 Model specification

Model is contained within the `MODEL` tag.
All numerical values can be integers only.

1.1 Example

```
<MODEL>
   <STRUCTURE unspec="error">
      <SPECIE name="SampleOne" max="1" basal="1">
         <INTERACTIONS>
            <INTER source="1" threshold ="1" />
         </INTERACTIONS>
         <REGULATIONS>
            <REGUL mask="0" t_value="-1" />
            <REGUL mask="1" t_value="-1" />
         </REGULATIONS>
      </SPECIE>
      <SPECIE name="SampleTwo" max="1" basal="0">
         <INTERACTIONS>
            <INTER source="0" threshold ="1" />
         </INTERACTIONS>
         <REGULATIONS>
            <REGUL mask="0" t_value="-1" />
            <REGUL mask="1" t_value="-1" />
         </REGULATIONS>
      </SPECIE>
```

```
   </STRUCTURE>
   <AUTOMATON>
      <STATE final="0">
         <TRANSITIONS>
            <TRANS label="SampleOne=1" target="1" />
            <TRANS label="SampleOne=0" target="0" />
         </TRANSITIONS>
      </STATE>
      <STATE final="1">
         <TRANSITIONS>
            <TRANS label="SampleOne=1" target="2" />
            <TRANS label="SampleOne=0" target="0" />
         </TRANSITIONS>
      </STATE>
      <STATE final="0">
         <TRANSITIONS>
            <TRANS label="SampleOne=1" target="2" />
            <TRANS label="SampleOne=0" target="1" />
         </TRANSITIONS>
      </STATE>
   </AUTOMATON>
</MODEL>
```

1.2 Description of model

Model is described within `STRUCTURE` tag.

1.2.1 `STRUCTURE`

`unspec` Currently unused, supposed do delimit handling of unspecified regulations.
`STRUCTURE` holds `SPECIES`

1.2.2 `SPECIE`

`name` Name of the specie, currently used for a reference in Büchi automaton.
`max` Maximal value the specie can have. Minimal is always zero.
`SPECIE` holds container of `INTERACTIONS` and container of `REGULATIONS`.

1.2.3 INTER

`source` Index of the specie (numbered from zero) the is a source of the interaction.
`threshold` Lowest value of the source specie that activates this interaction.

1.2.4 REGUL

`mask` Boolean mask over all incoming interactions (1 for active, 0 for non-active)
$t_v alue Target value for given regulatory context - must be a value the state can occur in or - 1, meaning this value is a parameter.$
$Currently all regulations (exponentially many w.r.t. incomming interactions) must be explicitly sp$

1.3 Description of property

Property is described within AUTOMATON tag using the Büchi automaton.

1.3.1 AUTOMATON

AUTOMATON holds STATES

1.3.2 STATE

final 1 if the state is final, 0 otherwise
STATE holds container of TRANSITIONS.

1.3.3 TRANS

label Atomic propositions or dual clause of atomic propositions.
Each AP is in the form: SpecieName*Value where Value is an integer and * is one of <,=,>. AP can also be a negation of previous written !AP.
target Index of a state (indexed from 0) that is reachable if the property is true.

1.3.4 Creating Büchi automaton

It is important to keep in mind that Büchi automata are non-deterministic.