Object Diagrams

Definition. An object labeled graph is a triple \( G = (N, E, f) \) consisting of
- vertexes \( N \),
- edges \( E \),
- node labeling \( f : N \rightarrow X \), where \( X \) is some label domain.

Example

Example 1:

\[ G = (N, E, f) \]

Example 2:

\[ G = (N, E, f) \]

Example 3:

\[ G = (N, E, f) \]
...
In the following, \( \sigma \) denotes a signature and \( \theta \) a structure of \( \sigma \).

**Definition (Satisfaction Relation).** Let \( \phi \) be an OCL constraint over \( \sigma \) and \( \sigma \in \Sigma \) a system state. We write:

- \( \sigma | = \phi \) if and only if \( I_{\sigma} \phi = true \).
- \( \sigma \not{|} = \phi \) if and only if \( I_{\sigma} \phi = false \).

Note: In general, we can't conclude from \( \neg (\sigma | = \phi) \) to \( \sigma \not{|} = \phi \) or vice versa.
Navigations are applied to atoms and not sets of atoms, although there is a less rich Constrain OCL, use a line to see the scope of quantified variables.

Options:

- And now

Let there exist an object diagram of structure: 

- and evaluate to

\[
\begin{align*}
(p_{1}, p_{2}, \ldots, p_{n}) = & \exists w \in \text{allInstances}^{n} \text{wrt.} \\
& \text{complete} - \text{what if not complete wrt. object/attribute/both?} \\
\end{align*}
\]

Example:

- \((p = \ldots) = \emptyset\) if \(\emptyset\) is called consistent.

Let \(\emptyset\) be a set.

Deciding OCL Consistency

A procedure which decides the OCL satisfiability problem.

Meeting the made-up example:


