Parameterized Modules

Modules with parameters are quite different than ordinary modules. In fact, they are not really modules at all. When a module is provided to instantiate a parameter, it is imported, and only then is a specification obtained (i.e., the entire set of equations becomes known). A parameterized module is a partial scheme for specifications that may be completed repeatedly in many different ways. It is effectively a mapping from a given parameter module(s) to a completed specification.

Theories are constraints placed on module parameters. The modules that eventually fill the role of the parameters are required to meet these constraints to assure a coherent interface. Several commonly occurring constraints (theories) are pre-defined in CafeOBJ:
• TRIV makes no requirement other than the inclusion of a sort named Elt.

• POSET requires the Elt sort plus an operation \(_<\_ : \text{Elt Elt} \to \text{Elt}\) that satisfies the two equations:
  \[
  \begin{align*}
  &\text{eq } E1 < E1 = \text{false} \\
  &\text{cq } E1 < E3 \text{ if } E1 < E2 \text{ and } E2 < E3
  \end{align*}
  \]

• EQV requires the Elt sort plus an operation \(\text{eq} : \text{Elt Elt} \to \text{Elt}\) that satisfies the two equations:
  \[
  \begin{align*}
  &\text{eq } (E1 \text{ eq } E1) = true, \\
  &\text{cq } (E1 \text{ eq } E3) = true \text{ if } (E1 \text{ eq } E2) \text{ and } (E2 \text{ eq } E3).
  \end{align*}
  \]