| | | | |
|---|---|---|---|
| values $v$ | ::= | $x$ | variable |
| | \| | $()$ | unit |
| | \| | $n$ | integer |
| | \| | $\texttt{Left}\ v \mid \texttt{Right}\ v$ | sum constructors |
| | \| | $(v_1, v_2)$ | pair |
| | \| | $\texttt{fun}\ x \mapsto c$ | function |
| | \| | $\texttt{handler}\ (\texttt{ret}\ x \mapsto c_r; h)$ | handler |
| computations $c$ | ::= | $\texttt{ret}\ v$ | returned value |
| | \| | $v_1\ v_2$ | application |
| | \| | $\texttt{match}\ v\ \texttt{with}\ \texttt{Left}\ x \mapsto c_1 \mid \texttt{Right}\ x \mapsto c_2$ | sum match |
| | \| | $\texttt{match}\ v\ \texttt{with}\ (x, y) \mapsto c$ | product match |
| | \| | $op(v; y.c)$ | operation call |
| | \| | $\texttt{let rec}\ f\ x = c_1\ \texttt{in}\ c_2$ | recursive function |
| | \| | $\texttt{do}\ x \leftarrow c_1\ \texttt{in}\ c_2$ | sequencing |
| | \| | $\texttt{with}\ v\ \texttt{handle}\ c$ | handling |
| operation clauses $h$ | ::= | $\emptyset \mid h \cup \{op(x; k) \mapsto c_{op}\}$ | |

Figure 1: *EEFF* Term Syntax

| | | | |
|---|---|---|---|
| (value) type $A, B$ | ::= | $\texttt{unit}$ | unit type |
| | $\mid$ | $\texttt{int}$ | int type |
| | $\mid$ | $\texttt{empty}$ | empty type |
| | $\mid$ | $A + B$ | sum type |
| | $\mid$ | $A \times B$ | product type |
| | $\mid$ | $A \to \underline{C}$ | function type |
| | $\mid$ | $\underline{C} \Rightarrow \underline{D}$ | handler type |
| computation type $\underline{C}, \underline{D}$ | ::= | $A ! \Sigma / \mathcal{E}$ | |
| signature $\Sigma$ | ::= | $\emptyset \mid \Sigma \cup \{op : A \to B\}$ | |
| value context $\Gamma$ | ::= | $\varepsilon \mid \Gamma, x : A$ | |
| template context $\mathtt{Z}$ | ::= | $\varepsilon \mid \mathtt{Z}, z : A \to *$ | |
| template $T$ | ::= | $z\ v$ | applied variable |
| | $\mid$ | $\texttt{match}\ v\ \texttt{with}\ \texttt{Left}\ x \mapsto T_1 \mid \texttt{Right}\ x \mapsto T_2$ | sum match |
| | $\mid$ | $\texttt{match}\ v\ \texttt{with}\ (x, y) \mapsto T$ | product match |
| | $\mid$ | $op(v;\ y.T)$ | operation call |
| (effect) theory $\mathcal{E}$ | ::= | $\emptyset \mid \mathcal{E} \cup \{\Gamma; \mathtt{Z} \vdash T_1 \sim T_2\}$ | |

Figure 2: *EEFF* Type Syntax