$$
\begin{array}{rcll}
Q & \leftarrow & \mathbf{proj}[T] & \text{(Query)} \\
T & \leftarrow & \mathbf{named}[T](f[T.meta, *]) & \text{(Tables)} \\
 & & \mathbf{aggr}[T, \bar{c}, \bar{\alpha}](f[\bar{\tau}, *]) & \\
 & & \mathbf{join}[T_1, T_2](f[T_1.meta, T_2.meta]) & \\
f[L,R] & \leftarrow & \mathbf{and}(f[L,R], f[L,R]) & \text{(Filters)} \\
 & & \mathbf{or}(f[L,R], f[L,R]) & \\
 & & \mathbf{neg}(f[L,R]) & \\
 & & \mathbf{cmp}(v[L], v[R], op) & \\
v[S] & \leftarrow & v,\ s.t.\ v \in S & \text{(Value)} \\
T.meta & \leftarrow & \text{(Metadata/Schema of T)} & \\
* & \leftarrow & \text{(The set containing all variables in the environment)} & \\
\tau & \leftarrow & \text{(An aggregation target)} &
\end{array}
$$

$$
\begin{array}{rcll}
\mathcal{C} & \leftarrow & \bar{b} & \text{(Constraints)} \\
v & \leftarrow & const & \text{(Values)} \\
 & & c_O & \\
 & & c_I[\overline{c_I = v}] & \\
 & & \mathcal{F}(c_I; \overline{c_I = v}) & \\
 & & \mathcal{E}(\bar{v}) & \\
 & & \mathsf{case}\ (b, v_1, v_2) & \\
b & \leftarrow & (\bar{c}_O) \sim (\bar{c}_I) & \text{(Boolean Expressions)} \\
 & & c_O\ op\ v & \\
 & & \mathcal{E}(c_O)\ op\ v & \\
 & & \mathsf{exists}(\overline{c_I = v}) & \\
 & & \mathsf{not}\ b & \\
op & \leftarrow & \texttt{<}, \texttt{>}, \texttt{=}, \texttt{<>} & \text{(Operators)} \\
\mathcal{F} & \leftarrow & \texttt{max}, \texttt{min}, \texttt{sum}, \texttt{avg}, \texttt{count}, \texttt{concat} & \text{(Aggregation Functions)} \\
\mathcal{E} & \leftarrow & v,\ \mathcal{E}(v) + \mathcal{E}(v), & \text{(Expressions)} \\
 & & \mathcal{E}(v)/\mathcal{E}(v), \mathcal{E}(v) - \mathcal{E}(v),\ \mathcal{E}(v) * \mathcal{E}(v) & \\
 & & \mathsf{unix\_timestamp}(v),\ \mathsf{year}(v), & \\
 & & \mathsf{month}(v),\ \mathsf{day}(v),\ \mathsf{time}(v) &
\end{array}
$$