1 Semântica Operacional Small-Step Linguagem Funcional

1.1 Sintaxe

$$
\begin{gathered}
E ::= n \mid v \mid b \mid E \; op \; E \\
\mid \texttt{If } E \texttt{ then } E \texttt{ else } E \\
\mid E \; E \mid \texttt{Fun } x : \texttt{T} \Rightarrow E \\
\mid \texttt{let } x : \texttt{T} = E \texttt{ in } E
\end{gathered}
$$

$$
\begin{gathered}
n \in \mathbb{Z} \\
b \in \{\texttt{true}, \texttt{false}\} \\
op ::= + \mid - \mid * \mid \ldots \\
T :: \text{Int} \mid \text{Bool} \mid T \to T \\
v :: n \mid b \mid \texttt{Fun } x : \texttt{T} \Rightarrow E
\end{gathered}
$$

1.2 Semântica

(SOMA1)

$$\frac{E_1 \to E_1^{'}}{E_1 + E_2 \to E_1^{'} + E_2}$$

(SOMA2)

$$\frac{E \to E^{'}}{n + E \to n + E^{'}}$$

(SOMA3)

$$\frac{}{n_1 + n_2 \to \texttt{sum}(n_1, n_2)}$$

(AP1)

$$\frac{E_1 \to E_1^{'}}{E_1 \; E_2 \to E_1^{'} \; E_2}$$

(AP2)

$$\frac{E \to E^{'}}{v \; E \to v \; E^{'}}$$

(AP3)

$$\frac{}{(\texttt{Fun } x : \texttt{T} \Rightarrow E) \; v \to \{v/x\}E}$$

(Let1)

$$\frac{E_1 \to E_1^{'}}{\texttt{let } x : \texttt{T} = E_1 \texttt{ in } E_2 \to \texttt{let } x : \texttt{T} = E_1^{'} \texttt{ in } E_2}$$

(Let2)

$$\frac{}{\texttt{let } x : \texttt{T} = v \texttt{ in } E \to \{v/x\}E}$$