Second assignment blablabla

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1 Semantic functions and domains

$$
\begin{aligned}
Loc &= \mathbb{N} \\
s \in Store &= Loc \to \mathbb{Z} \\
\rho \in VEnv &= Var \to Loc \\
\pi \in PEnv &= PName \to Proc \\
Proc &= Loc \to Store_\perp \to Store_\perp \\
\mathcal{N}[[\cdot]] &: Num \to \mathbb{Z} \\
\mathcal{B}[[\cdot]] &: BExpr \to VEnv \to Store_\perp \to \{\texttt{tt}, \texttt{ff}\} \\
\mathcal{E}[[\cdot]] &: Expr \to VEnv \to Store_\perp \to \mathbb{Z} \\
\mathcal{I}[[\cdot]] &: Instr \to VEnv \times PEnv \to Store_\perp \to Store_\perp \\
\mathcal{D}[[\cdot]] &: Decl \to VEnv \times PEnv \times Store_\perp \to VEnv \times PEnv \times Store_\perp
\end{aligned}
$$

It is assumed that all functions that receive $\perp$ as an argument always return $\perp$.

2 Equations

$$
\begin{aligned}
\mathcal{D}[[\texttt{proc}\ \ p(x)\ \ I]](\rho, \pi, s) &= (\rho, \pi[p \mapsto \text{least fixed point of } \Phi], s) \\
&\quad \texttt{where}\ \ \Phi(F) = \lambda l.\lambda s.s'[l \mapsto s'l'] \\
&\quad \texttt{where}\ \ s' = \mathcal{I}[[I]](\rho[x \mapsto l'], \pi[p \mapsto F])(s[l' \mapsto sl]) \\
&\quad \texttt{where}\ \ l' = newloc(\rho) \\
\mathcal{I}[[\texttt{call}\ \ p(x)]](\rho, \pi) &= \pi p(\rho x)
\end{aligned}
$$