

(This is still leaving out initialization-state for simplicity)

$\Delta \text{ ctx}$

$$\frac{}{\cdot \text{ ctx}} \quad \frac{\Delta \text{ ctx}}{\Delta, \rho \text{ ctx}} \quad \frac{\Delta \text{ ctx} \quad \Delta \vdash \sigma \text{ stack}}{\Delta, \alpha_{n,\sigma} \text{ ctx}} \quad \frac{\Delta \text{ ctx} \quad \Delta \vdash \sigma \text{ stack}}{\Delta, \ell_\sigma \text{ ctx}} \\ \frac{\Delta \text{ ctx} \quad \Delta, \sigma \vdash \ell_1 \text{ lifetime} \quad \Delta, \sigma \vdash \ell_2 \text{ lifetime}}{\Delta, \ell_1 \leq_\sigma \ell_2 \text{ ctx}}$$

$\Delta \vdash \sigma \text{ stack}$

$$\frac{}{\Delta \vdash \text{nil} \text{ stack}} \quad \frac{\rho \in \Delta}{\Delta \vdash \rho \text{ stack}} \quad \frac{\Delta \vdash \sigma \text{ stack} \quad \Delta, \sigma \vdash \tau \text{ type}}{\Delta \vdash \tau :: \sigma \text{ stack}} \quad \frac{\Delta \vdash \sigma \text{ stack}}{\Delta \vdash \ell :: \sigma \text{ stack}}$$

$\Delta, \sigma \vdash \ell \text{ lifetime}$

$$\frac{\Delta, \sigma \vdash \ell \text{ lifetime}}{\Delta, - :: \sigma \vdash \ell \text{ lifetime}} \quad \frac{\ell_\sigma \in \Delta}{\Delta, \sigma \vdash \ell_\sigma \text{ lifetime}} \quad \frac{}{\Delta, \ell :: \sigma \vdash \ell \text{ lifetime}} \quad \frac{}{\Delta, \sigma \vdash \text{static} \text{ lifetime}}$$

$\Delta, \sigma \vdash \tau \text{ type}$

$$\frac{\Delta, \sigma \vdash \tau \text{ type}_n}{\Delta, \sigma \vdash \tau \text{ type}}$$

$\Delta, \sigma \vdash \tau \text{ type}_n$

$$\frac{\Delta, \sigma \vdash \tau \text{ type}_n}{\Delta, - :: \sigma \vdash \tau \text{ type}_n} \quad \frac{\alpha_{n,\sigma} \in \Delta}{\Delta, \sigma \vdash \alpha_{n,\sigma} \text{ type}_n} \quad \frac{}{\Delta, \sigma \vdash \text{int} \text{ type}_4} \quad \frac{}{\Delta, \sigma \vdash \text{void}_n \text{ type}_n} \\ \frac{\Delta, \sigma \vdash \tau \text{ type}}{\Delta, \sigma \vdash \sim \tau \text{ type}_4} \quad \frac{\Delta, \sigma \vdash \ell \text{ lifetime} \quad q \text{ qualifer} \quad \Delta, \sigma \vdash \tau \text{ type}}{\Delta, \sigma \vdash \& \ell q \tau \text{ type}_4} \\ \frac{\Delta, \sigma \vdash \tau_1 \text{ type}_{n_1} \quad \dots \quad \Delta, \sigma \vdash \tau_k \text{ type}_{n_k}}{\Delta, \sigma \vdash [\tau_i]_{i \in \{1 \dots k\}} \text{ type}_{n_1 + \dots + n_k}} \quad \frac{\Delta, \sigma \vdash \tau_1 \text{ type}_n \quad \dots \quad \Delta, \sigma \vdash \tau_k \text{ type}_n}{\Delta, \sigma \vdash \langle \tau_i \rangle_{i \in \{1 \dots k\}} \text{ type}_{4+n}}$$

$$\frac{\Delta + \Delta' \vdash \Gamma \text{ register}}{\Delta, \sigma \vdash \forall[\Delta']\Gamma \text{ type}_4}$$

$\Delta \vdash \Gamma \text{ register}$

$$\frac{\Delta \vdash \sigma \text{ stack} \quad \Delta, \sigma \vdash \tau_1 \text{ type}_4 \quad \dots \quad \Delta, \sigma \vdash \tau_k \text{ type}_4}{\Delta \vdash \{r_1 : \tau_1, \dots, r_k : \tau_k, \text{sp} : \sigma\} \text{ register}}$$

$\Delta, \sigma \vdash \ell_1 \leq \ell_2$

$$\frac{\Delta, \sigma \vdash \ell_1 \leq \ell_2}{\Delta, - :: \sigma \vdash \ell_1 \leq \ell_2} \quad \frac{\ell_1 \leq_\sigma \ell_2 \in \Delta}{\Delta, \sigma \vdash \ell_1 \leq \ell_2} \quad \frac{\Delta, \ell_1 :: \sigma \vdash \ell_2 \text{ lifetime}}{\Delta, \ell_1 :: \sigma \vdash \ell_1 \leq \ell_2} \quad \frac{\Delta, \sigma \vdash \ell \text{ lifetime}}{\Delta, \sigma \vdash \ell \leq \text{static}}$$

$q \text{ qualifer}$

mut qualifer

imm qualifer