$$\text{ID}\ \frac{x:\sigma \in A}{A \vdash x:\sigma} \qquad\qquad \text{CONST}\ \frac{type(c)=\gamma}{A \vdash c:\gamma}$$

$$\text{APP}\ \frac{A \vdash e:\tau' \to \tau \qquad A \vdash e':\tau'}{A \vdash (e\ e'):\tau} \qquad\qquad \text{ABS}\ \frac{A \cup \{x:\tau\} \vdash e:\tau'}{A \vdash (\lambda\ x\ e):\tau \to \tau'}$$

$$\text{LET}\ \frac{A \cup \{x:\tau\} \vdash e:\sigma \qquad A \cup \{x:\sigma\} \vdash e':\tau' \qquad \tau \sqsubseteq \sigma}{A \vdash (let\ x\ e\ e'):\tau'}$$

$$\color{blue}{\text{GEN}}\ \frac{A \vdash e:\forall\{\alpha_i\}.\tau \to \tau' \qquad \alpha \notin free(A)}{A \vdash e:\forall\alpha.\forall\{\alpha_i\}.\tau \to \tau'} \qquad \color{blue}{\text{SPE}}\ \frac{A \vdash e:\forall\{\alpha_i\}.\tau \qquad \tau' = [\alpha_i \mapsto \tau_i]\,\tau}{A \vdash \color{red}{[\alpha_i \mapsto \tau_i]}\ e:\tau'}$$

$$\color{blue}{\text{COND}}\ \frac{A \vdash e_p:\tau_p \qquad [\alpha'_i \mapsto \tau'_i]\,A \vdash e':\tau \qquad [\alpha''_i \mapsto \tau''_i]\,A \vdash e'':\tau}{A \vdash (if\ e_p\ \color{red}{[\alpha'_i \mapsto \tau'_i]}\ e'\ \color{red}{[\alpha''_i \mapsto \tau''_i]}\ e''):\tau}$$

$$\color{blue}{\text{COND}}\ \frac{\text{ID}\ \dfrac{x:B \in \{x:B\}}{\{x:B\} \vdash x:B} \qquad \dfrac{\text{CONST}\ \dfrac{type(1)=N}{\{x:B\} \vdash 1:N}}{[\alpha \mapsto N]\,\{x:B\} \vdash 1:\alpha} \qquad \dfrac{\text{CONST}\ \dfrac{type(\text{"}foo\text{"})=S}{\{x:B\} \vdash \text{"}foo\text{"}:S}}{[\alpha \mapsto S]\,\{x:B\} \vdash \text{"}foo\text{"}:\alpha}}{\{x:B\} \vdash (if\ x\ \color{red}{[\alpha \mapsto N]}\ 1\ \color{red}{[\alpha \mapsto S]}\ \text{"}foo\text{"}):\alpha}$$

$$A := \{y : B, incr : N \to N, repeat : S \to S\}$$

$$\text{APP}\ \dfrac{\text{ID}\ \dfrac{incr : N \to N \in A \cup x : N}{A \cup x : N \vdash incr : N \to N} \qquad \text{ID}\ \dfrac{x : N \in A \cup x : N}{A \cup x : N \vdash x : N}}{\dfrac{A \cup x : N \vdash (incr\ x) : N}{[\alpha \mapsto N]\, A \cup x : \alpha \vdash (incr\ x) : \alpha \qquad (*)}}$$

$$\text{COND}\ \dfrac{\text{ID}\ \dfrac{y : B \in A \cup x : \alpha}{A \cup x : \alpha \vdash y : B} \qquad (*) \qquad \dfrac{\ldots}{[\alpha \mapsto S]\, A \cup x : \alpha \vdash (repeat\ x) : \alpha}}{A \cup x : \alpha \vdash (if\ y\ \ [\alpha \to N]\ \ (incr\ x)\ \ [\alpha \to S]\ \ (double\ x)) : \alpha}$$