Term variables, x, y, z	variables
Type variables, a, b	type variables
Integers, i	

Monotypes, τ	$::=$			Monotypes
	$\vert$	$\texttt{Int}$		
	$\vert$	a		
	$\vert$	$\tau_1 \rightarrow \tau_2$		
Rho-types, ρ	$::=$			Rho-types
	$\vert$	τ		
	$\vert$	$\sigma \rightarrow \sigma'$		
	$\vert$	(ρ)	S	
Polytypes, σ	$::=$			
	$\vert$	ρ		
	$\vert$	$\forall a.\sigma$	bind a in σ	
	$\vert$	$[a \mapsto \tau]\,\sigma$	M	
Terms, t, u	$::=$			
	$\vert$	i		Literal
	$\vert$	x		Variable
	$\vert$	$\lambda x.t$	bind x in t	Abstraction
	$\vert$	$t\ u$		Application
	$\vert$	$\lambda(x :: \sigma).t$	bind x in t	Typed abstraction
	$\vert$	$\texttt{let}\ x = u\ \texttt{in}\ t$	bind x in t	Local binding
	$\vert$	$t :: \sigma$		Type annotation
	$\vert$	(t)	S	
	$\vert$	$t\,[x \leadsto t']$	M	
Typing contexts, Γ	$::=$			
	$\vert$	ϵ		empty context
	$\vert$	$\Gamma, x : \sigma$		assumption
value, v	$::=$			
	$\vert$	i		
	$\vert$	$\lambda x.t$	bind x in t	
	$\vert$	$\lambda(x :: \sigma).t$	bind x in t	
fv	$::=$			
	$\vert$	$\mathit{fv}(t)$	M	
ftvany	$::=$			
	$\vert$	$\mathrm{ftv}(\tau)$	M	
	$\vert$	$\mathrm{ftv}(\rho)$	M	
	$\vert$	$\mathrm{ftv}(\sigma)$	M	
	$\vert$	$\mathrm{ftv}(\Gamma)$	M	
terminals	$::=$			
	$\vert$	$\longrightarrow$		
	$\vert$	$\rightarrow$		
	$\vert$	$::$		
	$\vert$	fv		

	$\vert$	ftv
	$\vert$	$\in$
	$\vert$	$\notin$
	$\vert$	$\vdash$
$\mathit{formula}$	$::=$	
	$\vert$	$\mathit{judgement}$
	$\vert$	$\mathsf{value}\, v$
	$\vert$	$\mathsf{uniq}\, \Gamma$
	$\vert$	$\mathsf{closed}\, \sigma$
	$\vert$	$a \notin \mathit{ftvany}$
	$\vert$	$x : \sigma \ \in \ \Gamma$
$\mathit{JTyping}$	$::=$	
	$\vert$	$\Gamma \vdash t : \sigma$
JStep	$::=$	
	$\vert$	$t \longrightarrow u$
$\mathit{judgement}$	$::=$	
	$\vert$	$\mathit{JTyping}$
	$\vert$	JStep
$\mathit{user\_syntax}$	$::=$	
	$\vert$	Term variables
	$\vert$	Type variables
	$\vert$	Integers
	$\vert$	Monotypes
	$\vert$	Rho-types
	$\vert$	Polytypes
	$\vert$	Terms
	$\vert$	Typing contexts
	$\vert$	value
	$\vert$	fv
	$\vert$	ftvany
	$\vert$	$\mathit{terminals}$
	$\vert$	$\mathit{formula}$

$\boxed{\Gamma \vdash t : \sigma}$

$$\frac{}{\Gamma \vdash i : \mathtt{Int}} \quad \text{TYP\_INT}$$

$$\frac{\begin{array}{l}\mathsf{uniq}\, \Gamma \\ x : \sigma \ \in \ \Gamma\end{array}}{\Gamma \vdash i : \sigma} \quad \text{TYP\_VAR}$$

$$\frac{\Gamma, x : \tau \vdash t : \rho}{\Gamma \vdash (\lambda x.t) : (\tau \rightarrow \rho)} \quad \text{TYP\_ABS}$$

$$\frac{\begin{array}{l}\mathsf{closed}\, \tau \\ \Gamma, x : \tau \vdash t : \rho\end{array}}{\Gamma \vdash (\lambda(x :: \tau).t) : (\tau \rightarrow \rho)} \quad \text{TYP\_ANNOT\_ABS}$$

$$\frac{\Gamma \vdash t : \tau \to \rho \quad \Gamma \vdash u : \tau}{\Gamma \vdash t\ u : \rho} \quad \textsc{typ\_app}$$

$$\frac{\Gamma \vdash u : \sigma \quad \Gamma, x : \sigma \vdash t : \rho}{\Gamma \vdash \texttt{let}\ x = u\ \texttt{in}\ t : \rho} \quad \textsc{typ\_let}$$

$$\frac{\mathsf{closed}\,\sigma \quad \Gamma \vdash t : \sigma}{\Gamma \vdash (t :: \sigma) : \sigma} \quad \textsc{typ\_annot}$$

$$\frac{a \notin \mathrm{ftv}(\Gamma) \quad \Gamma \vdash t : \rho}{\Gamma \vdash t : \forall a.\rho} \quad \textsc{typ\_gen}$$

$$\frac{\Gamma \vdash t : \forall a.\rho}{\Gamma \vdash t : [a \mapsto \tau]\,\rho} \quad \textsc{typ\_inst}$$

$\boxed{t \longrightarrow u}$

$$\frac{u \longrightarrow u'}{\texttt{let}\ x = u\ \texttt{in}\ t \longrightarrow \texttt{let}\ x = u'\ \texttt{in}\ t} \quad \textsc{step\_let1}$$

$$\frac{t \longrightarrow t'}{\texttt{let}\ x = v\ \texttt{in}\ t \longrightarrow \texttt{let}\ x = v\ \texttt{in}\ t'} \quad \textsc{step\_let2}$$

$$\frac{}{\texttt{let}\ x = v\ \texttt{in}\ t \longrightarrow t\,[x \rightsquigarrow v]} \quad \textsc{step\_let}$$

$$\frac{t \longrightarrow t'}{t\ u \longrightarrow t'\ u} \quad \textsc{step\_app1}$$

$$\frac{u \longrightarrow u'}{(\lambda x.t)\ u \longrightarrow (\lambda x.t)\ u'} \quad \textsc{step\_app2}$$

$$\frac{}{(\lambda x.t)\ v \longrightarrow t\,[x \rightsquigarrow v]} \quad \textsc{step\_app}$$

$$\frac{u \longrightarrow u'}{(\lambda(x :: \sigma).t)\ u \longrightarrow (\lambda(x :: \sigma).t)\ u'} \quad \textsc{step\_annot\_app2}$$

$$\frac{}{(\lambda(x :: \sigma).t)\ v \longrightarrow t\,[x \rightsquigarrow v]} \quad \textsc{step\_annot\_app}$$

$$\frac{}{t :: \sigma \longrightarrow t} \quad \textsc{step\_erase}$$

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Definition rules:        18 good    0 bad
Definition rule clauses: 37 good    0 bad
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