$termvar,\ x,\ y,\ z$
$trmlabel,\ a,\ b,\ c$
$typlabel,\ A,\ B,\ C$

$varref,\ v$	::=		
	|	x	
$trm,\ t$	::=		
	|	v	
	|	val	
	|	$v.a$	
	|	$v_1\ v_2$	
	|	$\mathbf{let}\ x = t_1\ \mathbf{in}\ t_2$	bind x in t_2
	|	$[v/x]t$	M
val	::=		
	|	$\nu\,(x : T)\,defs$	bind x in $defs$
	|	$\lambda(x : T).t$	bind x in t
$defs$	::=		
	|	$\{\}$	
	|	$d \wedge defs$	
	|	$[v/x]defs$	M
$def,\ d$	::=		
	|	$\{a = t\}$	
	|	$\{A = T\}$	
$typ,\ T$	::=		
	|	$\forall\,(x : T_1)\,T_2$	bind x in T_2
	|	$\mu\,(x : T)$	bind x in T
	|	dec	
	|	$v.A$	
	|	$T_1 \wedge T_2$	
	|	$\top$	
	|	$\bot$	
	|	$[v/x]\,T$	M
dec	::=		
	|	$\{a : T\}$	
	|	$\{A : T_1..T_2\}$	
$terminals$	::=		
	|	μ	
	|	ν	
	|	λ	
	|	$\wedge$	
	|	$\top$	
	|	$\bot$	
	|	$\forall$	
	|	$\emptyset$	

	$\vdash$
	$\rightarrow$
	$\notin$
	$\in$
	,

$ctx,\ E,\ F,\ \Gamma$	::=	
	|	$\emptyset$
	|	$(\Gamma, x : T)$

$stack,\ s$	::=	
	|	$\emptyset$
	|	$(s, x : t)$

$formula$	::=	
	|	$judgement$
	|	$\Gamma(x) = T$
	|	$\mathbf{uniq}\,\Gamma$
	|	$s(x) = t$
	|	$\mathbf{uniq}\,s$
	|	$d \in defs$

$Jtyping$	::=	
	|	$\Gamma \vdash t : T$
	|	$\Gamma \vdash d : T$
	|	$\Gamma \vdash defs : T$
	|	$\Gamma \vdash T_1 <: T_2$

Jop	::=	
	|	$(s_1, t_1) \rightarrow (s_2, t_2)$

$judgement$	::=	
	|	$Jtyping$
	|	Jop

$user\_syntax$	::=	
	|	$termvar$
	|	$trmlabel$
	|	$typlabel$
	|	$varref$
	|	trm
	|	val
	|	$defs$
	|	def
	|	typ
	|	dec
	|	$terminals$

| *ctx*
| *stack*
| *formula*

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

$$\frac{\Gamma(x) = T}{\Gamma \vdash x : T} \quad \text{TY\_VAR}$$

$$\frac{(\Gamma, x : T_1) \vdash t : T_2}{\Gamma \vdash \lambda(x : T_1).t : \forall\,(x : T_1)\,T_2} \quad \text{TY\_ALL\_INTRO}$$

$$\frac{\Gamma \vdash x : \forall\,(z : T_1)\,T_2 \qquad \Gamma \vdash y : T_1}{\Gamma \vdash x\ y : [y/z]\,T_2} \quad \text{TY\_ALL\_ELIM}$$

$$\frac{(\Gamma, x : [x/x]\,T) \vdash \mathit{defs} : T}{\Gamma \vdash \nu\,(x : T)\,\mathit{defs} : \mu\,(x : T)} \quad \text{TY\_NEW\_INTRO}$$

$$\frac{\Gamma \vdash x : \{a : T\}}{\Gamma \vdash x.a : T} \quad \text{TY\_NEW\_ELIM}$$

$$\frac{\Gamma \vdash t_1 : T_1 \qquad (\Gamma, x : T_1) \vdash t_2 : T_2}{\Gamma \vdash \mathbf{let}\ x = t_1\ \mathbf{in}\ t_2 : T_2} \quad \text{TY\_LET}$$

$$\frac{\Gamma \vdash x : T}{\Gamma \vdash x : \mu\,(z : T)} \quad \text{TY\_REC\_INTRO}$$

$$\frac{\Gamma \vdash x : \mu\,(z : T)}{\Gamma \vdash x : [x/z]\,T} \quad \text{TY\_REC\_ELIM}$$

$$\frac{\Gamma \vdash x : T_1 \qquad \Gamma \vdash x : T_2}{\Gamma \vdash x : T_1 \wedge T_2} \quad \text{TY\_AND\_INTRO}$$

$$\frac{\Gamma \vdash t : T_1 \qquad \Gamma \vdash T_1 <: T_2}{\Gamma \vdash t : T_2} \quad \text{TY\_SUB}$$

$\boxed{\Gamma \vdash d : T}$

$$\frac{\Gamma \vdash t : T}{\Gamma \vdash \{a = t\} : \{a : T\}} \quad \text{TY\_DEF\_TRM}$$

$$\frac{}{\Gamma \vdash \{A = T\} : \{A : T..T\}} \quad \text{TY\_DEF\_TYP}$$

$\boxed{\Gamma \vdash \mathit{defs} : T}$

$$\frac{\Gamma \vdash d : T}{\Gamma \vdash d \wedge \{\} : T} \quad \text{TY\_DEFS\_ONE}$$

$$\frac{\Gamma \vdash d : T_1 \qquad \Gamma \vdash \mathit{defs} : T_2}{\Gamma \vdash d \wedge \mathit{defs} : T_1 \wedge T_2} \quad \text{TY\_DEFS\_CONS}$$

$\boxed{\Gamma \vdash T_1 <: T_2}$

$$\frac{}{\Gamma \vdash T <: \top}\ \text{SUBTYP\_TOP}$$

$$\frac{}{\Gamma \vdash \bot <: T}\ \text{SUBTYP\_BOT}$$

$$\frac{}{\Gamma \vdash T <: T}\ \text{SUBTYP\_REFL}$$

$$\frac{\Gamma \vdash T_1 <: T_2 \quad \Gamma \vdash T_2 <: T_3}{\Gamma \vdash T_1 <: T_3}\ \text{SUBTYP\_TRANS}$$

$$\frac{}{\Gamma \vdash T_1 \wedge T_2 <: T_1}\ \text{SUBTYP\_AND11}$$

$$\frac{}{\Gamma \vdash T_1 \wedge T_2 <: T_2}\ \text{SUBTYP\_AND12}$$

$$\frac{\Gamma \vdash T_1 <: T_2 \quad \Gamma \vdash T_1 <: T_3}{\Gamma \vdash T_1 <: T_2 \wedge T_3}\ \text{SUBTYP\_AND2}$$

$$\frac{\Gamma \vdash T_1 <: T_2}{\Gamma \vdash \{a : T_1\} <: \{a : T_2\}}\ \text{SUBTYP\_FLD}$$

$$\frac{\Gamma \vdash T_1 <: T_2 \quad \Gamma \vdash T_3 <: T_4}{\Gamma \vdash \{A : T_2..T_3\} <: \{A : T_1..T_4\}}\ \text{SUBTYP\_TYP}$$

$$\frac{\Gamma \vdash x : \{A : T_1..T_2\}}{\Gamma \vdash x.A <: T_2}\ \text{SUBTYP\_SEL1}$$

$$\frac{\Gamma \vdash x : \{A : T_1..T_2\}}{\Gamma \vdash T_1 <: x.A}\ \text{SUBTYP\_SEL2}$$

$$\frac{\Gamma \vdash T_3 <: T_1 \quad (\Gamma, x : T_1) \vdash T_2 <: T_4}{\Gamma \vdash \forall\,(x : T_1)\,T_2 <: \forall\,(x : T_3)\,T_4}\ \text{SUBTYP\_FORALL}$$

$\boxed{(s_1, t_1) \to (s_2, t_2)}$

$$\frac{s(x) = \nu\,(z : T)defs \quad \{a = t\} \in [x/z]defs}{(s, x.a) \to (s, t)}\ \text{RED\_SEL}$$

$$\frac{s(x) = \lambda(z : T_1).t}{(s, x\ y) \to (s, [y/z]t)}\ \text{RED\_APP}$$

$$\frac{}{(s, \textbf{let}\ x = val\ \textbf{in}\ t) \to ((s, x : val), t)}\ \text{RED\_LET\_VAL}$$

$$\frac{}{(s, \textbf{let}\ x = y\ \textbf{in}\ t) \to (s, [y/x]t)}\ \text{RED\_LET\_VAR}$$

$$\frac{(s_1, t_1) \to (s_2, t_2)}{(s_1, \textbf{let}\ x = t_1\ \textbf{in}\ t_3) \to (s_2, \textbf{let}\ x = t_2\ \textbf{in}\ t_3)}\ \text{RED\_LET\_TGT}$$

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Definition rules:         31 good    0 bad
Definition rule clauses:  64 good    0 bad
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