

$n, m$			
$var, x$	term variable		
$tvar, X$	type variable		
$term, t$	$::=$		term
	$x$		variable
	$\lambda x . t$	bind $x$ in $t$	abstraction
	$t_1 t_2$		application
	$(t_1, \dots, t_n)$		tuple
	$(t)$	S	
	$\{t_1 / x\} t_2$	M	
$value, v$	$::=$		value
	$\lambda x . t$	bind $x$ in $t$	abstraction
	$(v_1, \dots, v_n)$		tuple
$type, S, T$	$::=$		type
	$X$		variable
	$T \rightarrow T'$		function
	$T_1 * \dots * T_n$		tuple
	$(T)$	S	
$env, E$	$::=$		type environment
	<b>empty</b>		
	$env, x : T$		
$formula$	$::=$		
	<i>judgement</i>		
	$x : T \in env$		
	<b>ok</b> <i>env</i>		
	$formula_1 \dots formula_n$		
$terminals$	$::=$		
	$\lambda$		
	$\longrightarrow$		
	$\rightarrow$		
	$\vdash$		
	$\in$		
$Jtype$	$::=$		
	$E \vdash t : T$		
$Jop$	$::=$		
	$t_1 \longrightarrow t_2$		$t_1$ reduces to $t_2$
$judgement$	$::=$		
	<i>Jtype</i>		
	<i>Jop</i>		
$user\_syntax$	$::=$		
	$n$		

| *var*  
 | *tvar*  
 | *term*  
 | *value*  
 | *type*  
 | *env*  
 | *formula*  
 | *terminals*

$E \vdash t : T$

**ok E**  
 $\frac{x : T \in E}{E \vdash x : T}$  TYPING\_VALUE\_NAME

$\frac{E \vdash t_1 : S \rightarrow T \quad E \vdash t_2 : S}{E \vdash t_1 t_2 : T}$  TYPING\_APPLY

$\frac{E, x : S \vdash t : T}{E \vdash \lambda x. t : S \rightarrow T}$  TYPING\_LAMBDA

**ok E**  
 $\frac{E \vdash t_1 : T_1 \quad \dots \quad E \vdash t_n : T_n}{E \vdash (t_1, \dots, t_n) : T_1 * \dots * T_n}$  TYPING\_TUPLE

$t_1 \longrightarrow t_2$   $t_1$  reduces to  $t_2$

$\frac{}{(\lambda x. t_1) v_2 \longrightarrow \{v_2 / x\} t_1}$  AX\_APP

$\frac{t_1 \longrightarrow t'_1}{t_1 t_2 \longrightarrow t'_1 t_2}$  CTX\_APP\_FUN

$\frac{t_2 \longrightarrow t'_2}{v_1 t_2 \longrightarrow v_1 t'_2}$  CTX\_APP\_ARG

$\frac{t \longrightarrow t'}{(v_1, \dots, v_n, t, t_1, \dots, t_m) \longrightarrow (v_1, \dots, v_n, t', t_1, \dots, t_m)}$  TUPLE

Definition rules: 8 good 0 bad  
 Definition rule clauses: 18 good 0 bad