$termvar,\ x,\ y,\ z,\ f$
$typevar,\ X,\ Y,\ Z$
$index,\ i,\ j,\ k$

$t,\ c,\ s$	$::=$		
	$\mid$	x	
	$\mid$	triv	
	$\mid$	squash_U	
	$\mid$	split_U	
	$\mid$	box_C	
	$\mid$	unbox_C	
	$\mid$	$\lambda x : A.t$	
	$\mid$	$t_1\ t_2$	
	$\mid$	(t_1, t_2)	
	$\mid$	$\mathsf{fst}\ t$	
	$\mid$	$\mathsf{snd}\ t$	
	$\mid$	$\mathsf{succ}\ t$	
	$\mid$	0	
	$\mid$	$\mathsf{case}\ t\ \mathsf{of}\ 0 \to t_1, (\mathsf{succ}\ x) \to t_2$	
	$\mid$	(t)	S
n	$::=$		
	$\mid$	0	
	$\mid$	$\mathsf{succ}\ n$	
v	$::=$		
	$\mid$	triv	
	$\mid$	$\lambda x : A.t$	
	$\mid$	n	
	$\mid$	split_U	
	$\mid$	squash_U	
	$\mid$	box_C	
	$\mid$	unbox_C	
U	$::=$		
	$\mid$	$? \to ?$	
	$\mid$	$? \times ?$	
T	$::=$		
	$\mid$	Unit	
	$\mid$	Nat	
$A,\ B,\ C,\ D,\ E,\ R$	$::=$		
	$\mid$	Unit	
	$\mid$	Nat	
	$\mid$	$?$	
	$\mid$	$A_1 \to A_2$	
	$\mid$	$A_1 \times A_2$	
	$\mid$	(A)	S
Γ	$::=$		

$$\begin{array}{l} \mid \quad . \\ \mid \quad \Gamma, x : A \end{array}$$

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

$$\frac{x : A \in \Gamma}{\Gamma \vdash x : A} \text{ VAR}$$

$$\frac{}{\Gamma \vdash \mathsf{box}_T : T \to ?} \text{ Box}$$

$$\frac{}{\Gamma \vdash \mathsf{unbox}_T : ? \to T} \text{ Unbox}$$

$$\frac{}{\Gamma \vdash \mathsf{Box}_A : A \to ?} \text{ BoxG}$$

$$\frac{}{\Gamma \vdash \mathsf{Unbox}_A : ? \to A} \text{ UnboxG}$$

$$\frac{}{\Gamma \vdash \mathsf{squash}_U : U \to ?} \text{ SQUASH}$$

$$\frac{}{\Gamma \vdash \mathsf{split}_U : ? \to U} \text{ SPLIT}$$

$$\frac{}{\Gamma \vdash \mathsf{triv} : \mathsf{Unit}} \text{ UNIT}$$

$$\frac{}{\Gamma \vdash 0 : \mathsf{Nat}} \text{ ZERO}$$

$$\frac{\Gamma \vdash t : \mathsf{Nat}}{\Gamma \vdash \mathsf{succ}\, t : \mathsf{Nat}} \text{ SUCC}$$

$$\frac{\begin{array}{l}\Gamma \vdash t : \mathsf{Nat} \\ \Gamma \vdash t_1 : A \quad \Gamma, x : \mathsf{Nat} \vdash t_2 : A\end{array}}{\Gamma \vdash \mathsf{case}\, t\, \mathsf{of}\, 0 \to t_1, (\mathsf{succ}\, x) \to t_2 : A} \text{ CASE}$$

$$\frac{\Gamma \vdash t_1 : A_1 \quad \Gamma \vdash t_2 : A_2}{\Gamma \vdash (t_1, t_2) : A_1 \times A_2} \text{ PAIR}$$

$$\frac{\Gamma \vdash t : A_1 \times A_2}{\Gamma \vdash \mathsf{fst}\, t : A_1} \text{ FST}$$

$$\frac{\Gamma \vdash t : A_1 \times A_2}{\Gamma \vdash \mathsf{snd}\, t : A_2} \text{ SND}$$

$$\frac{\Gamma, x : A \vdash t : B}{\Gamma \vdash \lambda x : A_1 . t : A \to B} \text{ LAM}$$

$$\frac{\Gamma \vdash t_1 : A \to B \quad \Gamma \vdash t_2 : A}{\Gamma \vdash t_1\, t_2 : B} \text{ APP}$$

$\boxed{\Gamma \vdash t_1 \rightsquigarrow t_2 : A}$

$$\frac{\Gamma \vdash s : A}{\Gamma \vdash s \rightsquigarrow s : A} \text{ RD\_VALUES}$$

$$\frac{\Gamma \vdash t : T}{\Gamma \vdash \mathsf{unbox}_T\, (\mathsf{box}_T\, t) \rightsquigarrow t : T} \text{ RD\_RETRACT}$$

$$\frac{\Gamma \vdash t : A}{\Gamma \vdash \mathsf{Unbox}_A\, (\mathsf{Box}_A\, t) \rightsquigarrow t : A} \text{ RD\_RETRACTG}$$

$$\frac{\Gamma \vdash t : U}{\Gamma \vdash \mathsf{split}_U\ (\mathsf{squash}_U\ t) \rightsquigarrow t : U}\ \textsc{rd\_retractU}$$

$$\frac{\Gamma \vdash t \rightsquigarrow t' : \mathsf{Nat}}{\Gamma \vdash \mathsf{succ}\ t \rightsquigarrow \mathsf{succ}\ t' : \mathsf{Nat}}\ \textsc{rd\_succ}$$

$$\frac{\Gamma \vdash t_1 : A \quad \Gamma, x : \mathsf{Nat} \vdash t_2 : A}{\Gamma \vdash \mathsf{case}\ 0\ \mathsf{of}\ 0 \to t_1, (\mathsf{succ}\ x) \to t_2 \rightsquigarrow t_1 : A}\ \textsc{rd\_case}0$$

$$\frac{\begin{array}{c}\Gamma \vdash t : \mathsf{Nat} \\ \Gamma \vdash t_1 : A \quad \Gamma, x : \mathsf{Nat} \vdash t_2 : A\end{array}}{\Gamma \vdash \mathsf{case}\ (\mathsf{succ}\ t)\ \mathsf{of}\ 0 \to t_1, (\mathsf{succ}\ x) \to t_2 \rightsquigarrow [t/x]t_2 : A}\ \textsc{rd\_caseSucc}$$

$$\frac{\begin{array}{c}\Gamma \vdash t \rightsquigarrow t' : \mathsf{Nat} \\ \Gamma \vdash t_1 : A \quad \Gamma, x : \mathsf{Nat} \vdash t_2 : A\end{array}}{\Gamma \vdash \mathsf{case}\ t\ \mathsf{of}\ 0 \to t_1, (\mathsf{succ}\ x) \to t_2 \rightsquigarrow \mathsf{case}\ t'\ \mathsf{of}\ 0 \to t_1, (\mathsf{succ}\ x) \to t_2 : A}\ \textsc{rd\_case}$$

$$\frac{\Gamma, x : A_1 \vdash t_1 : A_2 \quad \Gamma \vdash t_2 : A_1}{\Gamma \vdash (\lambda x : A_1.t_1)\ v \rightsquigarrow [t_2/x]t_2 : A_2}\ \textsc{rd\_beta}$$

$$\frac{\Gamma \vdash t_1 : A_1 \quad \Gamma \vdash t_2 : A_2}{\Gamma \vdash \mathsf{fst}\ (t_1, t_2) \rightsquigarrow t_1 : A_1}\ \textsc{rd\_proj}1$$

$$\frac{\Gamma \vdash t_1 : A_1 \quad \Gamma \vdash t_2 : A_2}{\Gamma \vdash \mathsf{snd}\ (t_1, t_2) \rightsquigarrow t_2 : A_2}\ \textsc{rd\_proj}2$$

$$\frac{\Gamma \vdash t_1 \rightsquigarrow t_1' : A_1 \to A_2 \quad \Gamma \vdash t_2 : A_1}{\Gamma \vdash t_1\ t_2 \rightsquigarrow t_1'\ t_2 : A_2}\ \textsc{rd\_app}1$$

$$\frac{\Gamma \vdash v : A_1 \to A_2 \quad \Gamma \vdash t \rightsquigarrow t' : A_1}{\Gamma \vdash v\ t \rightsquigarrow v\ t' : A_2}\ \textsc{rd\_app}2$$

$$\frac{\Gamma \vdash t \rightsquigarrow t' : A_1 \times A_2}{\Gamma \vdash \mathsf{fst}\ t \rightsquigarrow \mathsf{fst}\ t' : A_1}\ \textsc{rd\_fst}$$

$$\frac{\Gamma \vdash t \rightsquigarrow t' : A_1 \times A_2}{\Gamma \vdash \mathsf{snd}\ t \rightsquigarrow \mathsf{snd}\ t' : A_2}\ \textsc{rd\_snd}$$

$$\frac{\Gamma \vdash t_1 \rightsquigarrow t_1' : A_1 \quad \Gamma \vdash t_2 : A_2}{\Gamma \vdash (t_1, t_2) \rightsquigarrow (t_1', t_2) : A_1 \times A_2}\ \textsc{rd\_pair}1$$

$$\frac{\Gamma \vdash t_1 : A_1 \quad \Gamma \vdash t_2 \rightsquigarrow t_2' : A_2}{\Gamma \vdash (t_1, t_2) \rightsquigarrow (t_1, t_2') : A_1 \times A_2}\ \textsc{rd\_pair}2$$

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Definition rules:         33 good    0 bad
Definition rule clauses: 61 good    0 bad
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