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

| $t,\ c,\ s$ | $::=$ | | |
|---|---|---|---|
| | $\|$ | $x$ | |
| | $\|$ | triv | |
| | $\|$ | $\text{squash}_U$ | |
| | $\|$ | $\text{split}_U$ | |
| | $\|$ | $\text{box}_C$ | |
| | $\|$ | $\text{unbox}_C$ | |
| | $\|$ | $\lambda x : A.t$ | |
| | $\|$ | $t_1\ t_2$ | |
| | $\|$ | $(t_1, t_2)$ | |
| | $\|$ | $\text{fst } t$ | |
| | $\|$ | $\text{snd } t$ | |
| | $\|$ | $\text{succ } t$ | |
| | $\|$ | $0$ | |
| | $\|$ | $\text{case } t \text{ of } 0 \to t_1, (\text{succ } x) \to t_2$ | |
| | $\|$ | $(t)$ | S |

| $n$ | $::=$ | | |
|---|---|---|---|
| | $\|$ | $0$ | |
| | $\|$ | $\text{succ } n$ | |

| $v$ | $::=$ | | |
|---|---|---|---|
| | $\|$ | triv | |
| | $\|$ | $\lambda x : A.t$ | |
| | $\|$ | $n$ | |
| | $\|$ | $\text{split}_U$ | |
| | $\|$ | $\text{squash}_U$ | |
| | $\|$ | $\text{box}_C$ | |
| | $\|$ | $\text{unbox}_C$ | |

| $T$ | $::=$ | | |
|---|---|---|---|
| | $\|$ | Unit | |
| | $\|$ | Nat | |

| $A,\ B,\ C,\ D,\ E,\ R,\ X,\ Y,\ U,\ S$ | $::=$ | | |
|---|---|---|---|
| | $\|$ | Unit | |
| | $\|$ | Nat | |
| | $\|$ | ? | |
| | $\|$ | $A_1 \to A_2$ | |
| | $\|$ | $A_1 \times A_2$ | |
| | $\|$ | $(A)$ | S |

| $\Gamma$ | $::=$ | | |
|---|---|---|---|
| | $\|$ | . | |
| | $\|$ | $\Gamma, x : A$ | |

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

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

$$\frac{}{\Gamma \vdash \mathsf{box}_T : T \to \,?} \quad \text{BOX}$$

$$\frac{}{\Gamma \vdash \mathsf{unbox}_T : \,? \to T} \quad \text{UNBOX}$$

$$\frac{}{\Gamma \vdash \mathsf{Box}_A : A \to \,?} \quad \text{BOXG}$$

$$\frac{}{\Gamma \vdash \mathsf{Unbox}_A : \,? \to A} \quad \text{UNBOXG}$$

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

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

$$\frac{}{\text{\textcolor{red}{<<no parses (char 10):\ \ G |- S***plit S : S -> ? >>}}} \quad \text{SPLITG}$$

$$\frac{}{\text{\textcolor{red}{<<no parses (char 10):\ \ G |- S***quash S : ? -> S >>}}} \quad \text{SQUASHG}$$

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\frac{\Gamma \vdash t : S}{\text{<<no parses (char 10): } \text{G |- S***plit S (Squash S t)} \text{ > t : } \text{ S >>}} \quad \text{RD\_RETRAC{\small T}SG}$$

$$\frac{\Gamma \vdash t : U}{\Gamma \vdash \mathsf{split}_U\,(\mathsf{squash}_U\,t) \rightsquigarrow t : U} \quad \text{RD\_RETRACT{\small U}}$$

$$\frac{\Gamma \vdash t \rightsquigarrow t' : \mathsf{Nat}}{\Gamma \vdash \mathsf{succ}\,t \rightsquigarrow \mathsf{succ}\,t' : \mathsf{Nat}} \quad \text{RD\_SUCC}$$

$$\frac{\Gamma \vdash t_1 : A \quad \Gamma, x : \mathsf{Nat} \vdash t_2 : A}{\Gamma \vdash \mathsf{case}\,0\,\mathsf{of}\,0 \to t_1, (\mathsf{succ}\,x) \to t_2 \rightsquigarrow t_1 : A} \quad \text{RD\_CASE0}$$

$$\frac{\Gamma \vdash t : \mathsf{Nat} \quad \Gamma \vdash t_1 : A \quad \Gamma, x : \mathsf{Nat} \vdash t_2 : A}{\Gamma \vdash \mathsf{case}\,(\mathsf{succ}\,t)\,\mathsf{of}\,0 \to t_1, (\mathsf{succ}\,x) \to t_2 \rightsquigarrow [t/x]t_2 : A} \quad \text{RD\_CASE{\small SUCC}}$$

$$\frac{\Gamma \vdash t \rightsquigarrow t' : \mathsf{Nat} \quad \Gamma \vdash t_1 : A \quad \Gamma, x : \mathsf{Nat} \vdash t_2 : A}{\Gamma \vdash \mathsf{case}\,t\,\mathsf{of}\,0 \to t_1, (\mathsf{succ}\,x) \to t_2 \rightsquigarrow \mathsf{case}\,t'\,\mathsf{of}\,0 \to t_1, (\mathsf{succ}\,x) \to t_2 : A} \quad \text{RD\_CASE}$$

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

$$\frac{\Gamma \vdash t_1 : A_1 \quad \Gamma \vdash t_2 : A_2}{\Gamma \vdash \mathsf{fst}\,(t_1, t_2) \rightsquigarrow t_1 : A_1} \quad \text{RD\_PROJ1}$$

$$\frac{\Gamma \vdash t_1 : A_1 \quad \Gamma \vdash t_2 : A_2}{\Gamma \vdash \mathsf{snd}\,(t_1, t_2) \rightsquigarrow t_2 : A_2} \quad \text{RD\_PROJ2}$$

$$\frac{\Gamma \vdash t_1 \rightsquigarrow t_1' : A_1 \to A_2 \quad \Gamma \vdash t_2 : A_1}{\Gamma \vdash t_1\,t_2 \rightsquigarrow t_1'\,t_2 : A_2} \quad \text{RD\_APP1}$$

$$\frac{\Gamma \vdash v : A_1 \to A_2 \quad \Gamma \vdash t \rightsquigarrow t' : A_1}{\Gamma \vdash v\,t \rightsquigarrow v\,t' : A_2} \quad \text{RD\_APP2}$$

$$\frac{\Gamma \vdash t \rightsquigarrow t' : A_1 \times A_2}{\Gamma \vdash \mathsf{fst}\,t \rightsquigarrow \mathsf{fst}\,t' : A_1} \quad \text{RD\_FST}$$

$$\frac{\Gamma \vdash t \rightsquigarrow t' : A_1 \times A_2}{\Gamma \vdash \mathsf{snd}\,t \rightsquigarrow \mathsf{snd}\,t' : A_2} \quad \text{RD\_SND}$$

$$\frac{\Gamma \vdash t_1 \rightsquigarrow t_1' : A_1 \quad \Gamma \vdash t_2 : A_2}{\Gamma \vdash (t_1, t_2) \rightsquigarrow (t_1', t_2) : A_1 \times A_2} \quad \text{RD\_PAIR1}$$

$$\frac{\Gamma \vdash t_1 : A_1 \quad \Gamma \vdash t_2 \rightsquigarrow t_2' : A_2}{\Gamma \vdash (t_1, t_2) \rightsquigarrow (t_1, t_2') : A_1 \times A_2} \quad \text{RD\_PAIR2}$$

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Definition rules:        33 good     3 bad
Definition rule clauses: 62 good     3 bad
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