termvar, x, y, h
idxvar, i

type, A, B	::=			Type
	|	1		Unit
	|	$A_1 \oplus A_2$		Sum
	|	$A_1 \otimes A_2$		Product
	|	$A_1 \multimap A_2$		Linear function
	|	$\mathsf{Dest}_s\, A$		Destination (s is the scope
	|	$A_1 \ltimes A_2$		Incomplete type (consumi
	|	(A)	S	
scope_index, s	::=			Concrete or abstract scope i
	|	i		
	|	n		
concrete_scope_index, n, m	::=			Concrete scope index
	|	0		
	|	$n{+}1$		
	|	(n)	S	
dynamic_value, dv	::=			dynamic value
	|	x		Var or Hole
	|	$@x$		Destination
	|	$()$		Unit
	|	$\mathsf{Inl}\ dv$		Left variant for sum
	|	$\mathsf{Inr}\ dv$		Right variant for sum
	|	$\langle dv_1 , dv_2 \rangle$		Product
	|	$\langle dv_1 \,;\, dv_2 \rangle$		Incomplete (dv_2 is the roo
	|	(dv)	S	
term, t, u	::=			Term
	|	dv		dynamic value
	|	$\lambda x{:}A\,.\,t$		linear function
	|	$t\ u$		application
	|	$t\ ;\ u$		discard unit
	|	$\mathsf{case}\ t\ \mathsf{of}\ \{\, \mathsf{Inl}\, x_1 \mapsto u_1 ,\ \mathsf{Inr}\, x_2 \mapsto u_2 \,\}$		pattern-match on sum
	|	$\mathsf{case}\ t\ \mathsf{of}\ \{\, \langle x_1 , x_2 \rangle \mapsto u \,\}$		pattern-match on product
	|	$\mathsf{case}\ t\ \mathsf{of}\ \{\, \langle x \,;\, \_ \rangle \mapsto \langle u \,;\, \_ \rangle \,\}$		map over the left side of t
	|	alloc		return a fresh Incomplete
	|	$\mathsf{into}\ t$		transform the ref value int
	|	$\mathsf{from}\ t$		transform a trivial incomp
	|	$t \triangleleft ()$		fill destination with unit
	|	$t \triangleleft \mathsf{Inl}$		fill destination with left va
	|	$t \triangleleft \mathsf{Inr}$		fill destination with right
	|	$t \triangleleft \langle,\rangle$		fill destination with produ
	|	$t \triangleleft \cdot u$		fill destination with root o
	|	(t)	S	
	|	$t[e]$	M	
sub	::=			variable or label substitution
	|	$x := v$		

subs	::=		variable or substitutions
	|	sub	
	|	sub, subs	
effect, e	::=		
	|	ε	empty effect
	|	subs	
type_affect, ta	::=		type affectation
	|	x : A	Var or Hole
	|	$-$x $:^{s}$ A	Destination
type_affects	::=		type affectations
	|	ta	
	|	ta, type_affects	
typing_context, $\mho$, Γ	::=		typing context
	|	$\{\}$	
	|	{type_affects}	
	|	$\Gamma_1 \sqcup \Gamma_2$	
	|	$\Gamma_1 \uplus \Gamma_2$	
terminals	::=		
	|	$:=$	
	|	$\multimap$	
	|	$\rtimes$	
	|	$\mapsto$	
	|	$\vdash$	
	|	$\sqcup$	
	|	$\uplus$	
	|	$\{\}$	
	|	$\neq$	
	|	$\in$	
	|	$\notin$	
	|	$()$	
	|	Inl	
	|	Inr	
	|	$\langle,\rangle$	
	|	$\triangleleft$	
	|	$\triangleleft\cdot$	
	|	$\mid$	
	|	$\Downarrow$	
	|	$\subset$	
	|	$\mathcal{N}$	
	|	$\Longrightarrow$	
	|	$;$	
	|	$\odot$	
	|	$\longrightarrow$	
	|	$\rightsquigarrow$	

$$
\begin{array}{lcll}
\mathsf{formula} & ::= & & \\
 & | & \mathsf{judgement} & \\
 & & & \\
\mathsf{Ctx} & ::= & & \\
 & | & \mathsf{x} \neq \mathsf{y} & \\
 & | & \mathsf{x} \in \mathcal{N}(\Gamma) & \\
 & | & \mathsf{x} \in \mathcal{N}(\Gamma) & \\
 & | & \mathsf{x} \notin \mathcal{N}(\Gamma) & \\
 & | & \mathsf{l} \notin \mathcal{N}(\Gamma) & \\
 & | & \mathsf{type\_affect} \in \Gamma & \\
 & | & \mathcal{N}(\Gamma_1) \cap \mathcal{N}(\Gamma_2) = \emptyset & \Gamma_1 \text{ and } \Gamma_2 \text{ are disjoint typing contexts} \\
 & | & \mathsf{fresh}\ \mathsf{x} & \\
 & & & \\
\mathsf{Eq} & ::= & & \\
 & | & \mathsf{A}_1 = \mathsf{A}_2 & \\
 & | & \mathsf{A}_1 \neq \mathsf{A}_2 & \\
 & | & \mathsf{t} = \mathsf{u} & \\
 & | & \Gamma = \mathsf{D} & \\
 & & & \\
\mathsf{Scope} & ::= & & \\
 & | & \mathsf{s}_1 < \mathsf{s}_2 & \\
 & | & \mathsf{s}_1 \leq \mathsf{s}_2 & \\
 & | & \mathsf{s}_1 > \mathsf{s}_2 & \\
 & | & \mathsf{s}_1 \geq \mathsf{s}_2 & \\
 & & & \\
\mathsf{Ty} & ::= & & \\
 & | & {}^{\mathsf{s}}\Gamma \vdash \mathsf{t} : \mathsf{A} & \\
 & & & \\
\mathsf{judgement} & ::= & & \\
 & | & \mathsf{Ctx} & \\
 & | & \mathsf{Eq} & \\
 & | & \mathsf{Scope} & \\
 & | & \mathsf{Ty} & \\
 & & & \\
\mathsf{user\_syntax} & ::= & & \\
 & | & \mathsf{termvar} & \\
 & | & \mathsf{idxvar} & \\
 & | & \mathsf{type} & \\
 & | & \mathsf{scope\_index} & \\
 & | & \mathsf{concrete\_scope\_index} & \\
 & | & \mathsf{dynamic\_value} & \\
 & | & \mathsf{term} & \\
 & | & \mathsf{sub} & \\
 & | & \mathsf{subs} & \\
 & | & \mathsf{effect} & \\
 & | & \mathsf{type\_affect} & \\
 & | & \mathsf{type\_affects} & \\
 & | & \mathsf{typing\_context} & \\
 & | & \mathsf{terminals} &
\end{array}
$$

$\boxed{x \neq y}$

$\boxed{x \in \mathcal{N}(\Gamma)}$

$\boxed{x \in \mathcal{N}(\Gamma)}$

$\boxed{x \notin \mathcal{N}(\Gamma)}$

$\boxed{l \notin \mathcal{N}(\Gamma)}$

$\boxed{\mathsf{type\_affect} \in \Gamma}$

$\boxed{\mathcal{N}(\Gamma_1) \cap \mathcal{N}(\Gamma_2) = \emptyset}$ Γ_1 and Γ_2 are disjoint typing contexts

$\boxed{\mathsf{fresh}\, x}$

$\boxed{A_1 = A_2}$

$\boxed{A_1 \neq A_2}$

$\boxed{t = u}$

$\boxed{\Gamma = D}$

$\boxed{s_1 < s_2}$

$\boxed{s_1 \leq s_2}$

$\boxed{s_1 > s_2}$

$\boxed{s_1 \geq s_2}$

$\boxed{{}^{s}\,\Gamma \vdash t : A}$

$$\frac{{}^{m}\,\Gamma \vdash t : A}{{}^{m+1}\,\Gamma \vdash t : A}\quad\textsc{TyTerm\_WeakenIdx}$$

$$\frac{}{{}^{m}\,\{x : A\} \vdash x : A}\quad\textsc{TyTerm\_VarHole}$$

$$\frac{n \leq m}{{}^{m}\,\{-x :^{n} A\} \vdash @x : \mathsf{Dest}_{n}\, A}\quad\textsc{TyTerm\_Dest}$$

$$\frac{}{{}^{m}\,\{\} \vdash () : 1}\quad\textsc{TyTerm\_Unit}$$

$$\frac{{}^{m}\,\Gamma \vdash dv : A_1}{{}^{m}\,\Gamma \vdash \mathsf{Inl}\, dv : A_1 \oplus A_2}\quad\textsc{TyTerm\_Inl}$$

$$\frac{{}^{m}\,\Gamma \vdash dv : A_2}{{}^{m}\,\Gamma \vdash \mathsf{Inr}\, dv : A_1 \oplus A_2}\quad\textsc{TyTerm\_Inr}$$

$$\frac{\begin{array}{c}{}^{m}\,\Gamma_1 \vdash dv_1 : A_1\\ {}^{m}\,\Gamma_2 \vdash dv_2 : A_2\end{array}}{{}^{m}\,\Gamma_1 \sqcup \Gamma_2 \vdash \langle dv_1 , dv_2 \rangle : A_1 \otimes A_2}\quad\textsc{TyTerm\_Prod}$$

$$\frac{\begin{array}{c}{}^{m}\,\Gamma_1 \vdash dv_1 : A_1\\ {}^{m}\,\Gamma_2 \vdash dv_2 : A_2\end{array}}{{}^{m}\,\Gamma_1 \uplus \Gamma_2 \vdash \langle dv_1 ; dv_2 \rangle : A_1 \rtimes A_2}\quad\textsc{TyTerm\_Incomplete}$$

```
Definition rules:         8 good    0 bad
Definition rule clauses: 16 good    0 bad
```