Phase 17 Demo : Semicolon - Separated Bindings

Example 1 : Two bindings

Simple case with two binding groups:

$\forall\, x : \mathbb{N} \bullet \forall\, y : \mathbb{N} \bullet x + y > 0$

Example 2 : Three bindings

Three levels of nesting:

$\forall\, x : T \bullet \forall\, y : U \bullet \forall\, z : V \bullet x = y$

Example 3 : Mixed comma land semicolon

First quantifier has multiple variables with shared domain:

$\forall\, x, y : \mathbb{N} \bullet \forall\, z : \mathbb{N} \bullet x + y = z$

Example 4 : Real - world example from Solution 41

$\forall\, r : \operatorname{ran} records \bullet \forall\, i1, i2 : \operatorname{dom} r \bullet i1 \neq i2.\ \text{true}$

Example 5 : Conditional with semicolon bindings

Combining Phase 16 and Phase 17:

$\forall\, x : \mathbb{N} \bullet \forall\, y : \mathbb{N} \bullet \mathsf{if}\ x > y \mathsf{then} x \mathsf{else} y$

Example 6 : Nested mu operator

Definite description with multiple bindings:

$((\mu\, p : \operatorname{ran} hd \mid (\mu\, q : \operatorname{ran} hd \mid p \neq q))\mid \mathrm{p}.2 > q.2)$

Example 7 : With exists quantifier

Multiple bindings with $\exists$:

$\exists\, x : \mathbb{N} \bullet \exists\, y : \mathbb{N} \bullet x > y \land\ y > 0$