

Midterm Review

Naturality of Operators

Symbol	Algebra	Subtyping
$+$	$\mathbb{Z} \times \mathbb{Z} \xrightarrow{\text{add}} \mathbb{Z}$	\mathbb{Z}
\downarrow	\downarrow	\downarrow
overloading	coerce	coerce
	$\mathbb{R} \times \mathbb{R} \xrightarrow{\text{add}} \mathbb{R}$	\mathbb{R}
		\wedge

Handwritten notes: "should be (no problem) (unambiguous)"

Non-Example

Symbol	Algebra	Subtyping
$+$	$\mathbb{Z} \times \mathbb{Z} \xrightarrow{\text{add}} \mathbb{Z}$	\mathbb{Z}
\downarrow	\downarrow	\downarrow
overloading	coerce	coerce
	$\mathbb{S} \times \mathbb{S} \xrightarrow{\text{append}} \mathbb{S}$	\mathbb{S}
		\wedge

Handwritten notes: "(1,2) → 3", "(ambiguous)", "(1,2) → 12+21"

Non-Fibration: Model Checking

<p>Object: (S, t, A, R)</p> <ul style="list-style-type: none"> S is a set $t \subseteq S \times S$ $A \subseteq S$ $R \subseteq S$ d is a pair $AA \neq \emptyset$ 	<p>Morphisms: $(f, p, \alpha, \beta): (S, t, A, R) \rightarrow (S', t', A', R')$</p> <ul style="list-style-type: none"> $f: S \rightarrow S'$ $p_f: \forall s, s'. s \in t' \Rightarrow f(s) \in t$ $p_A: \forall s \in S. s \in A \Rightarrow f(s) \in A'$ $p_R: \forall s \in S. s \in R \Rightarrow f(s) \in R'$ <p><i>Handwritten note: "this requirement makes it not an fibration"</i></p>
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