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AN Other

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Contents

1 Introduction

A file system has named files so we introduce file name and file content types.

$$[Name, File]$$

$$Path == \operatorname{seq} Name$$

$$\begin{array}{|l} \textit{FS} \\ \hline fs : Path \pfun File \\ \hline \end{array}$$

$$\begin{array}{|l} \textit{CreateFile} \\ \hline \Delta FS \\ p? : Path \\ f? : File \\ \hline p? \notin \operatorname{dom} fs \\ fs' = fs \cup \{p? \mapsto f?\} \\ \hline \end{array}$$

$$\begin{array}{|l} \textit{DeleteFile} \\ \hline \Delta FS \\ p? : Path \\ \hline p? \in \operatorname{dom} fs \\ fs' = \{p?\} \rhd fs \\ \hline \end{array}$$

2 Z Notation

Numbers:

$\mathbb{N}$ `Natural numbers {0,1,...}`

Propositional logic and the schema calculus:

$\ldots \land \ldots$	`And`	$\langle\!\langle \ldots \rangle\!\rangle$	`Free type injection`
$\ldots \lor \ldots$	`Or`	$[\ldots]$	`Given sets`
$\ldots \Rightarrow \ldots$	`Implies`	$', ?, !_{0 \ldots 9}$	`Schema decorations`
$\forall .. \mid .. \bullet ..$	`For all`	$\ldots \vdash \ldots$	`theorem`
$\exists .. \mid .. \bullet ..$	`There exists`	$\theta \ldots$	`Binding formation`
$\ldots \setminus \ldots$	`Hiding`	$\lambda \ldots$	`Function definition`
$\ldots \mathrel{\widehat=} \ldots$	`Schema definition`	$\mu \ldots$	`Mu-expression`
$\ldots == \ldots$	`Abbreviation`	$\Delta \ldots$	`State change`
$\ldots ::= \ldots \mid \ldots$	`Free type definition`	$\Xi \ldots$	`Invariant state change`

Sets and sequences:

$\{\ldots\}$	`Set`	$\ldots \setminus \ldots$	`Set difference`
$\{.. \mid .. \bullet ..\}$	`Set comprehension`	$\bigcup \ldots$	`Distributed union`
$\mathbb{P} \ldots$	`Set of subsets of`	$\# \ldots$	`Cardinality`
$\varnothing$	`Empty set`	$\ldots \subseteq \ldots$	`Subset`
$\ldots \times \ldots$	`Cartesian product`	$\ldots \subset \ldots$	`Proper subset`
$\ldots \in \ldots$	`Set membership`	$\ldots$ partition $\ldots$	`Set partition`
$\ldots \notin \ldots$	`Set non-membership`	seq	`Sequences`
$\ldots \cup \ldots$	`Union`	$\langle \ldots \rangle$	`Sequence`
$\ldots \cap \ldots$	`Intersection`	disjoint $\ldots$	`Disjoint sequence of sets`

Functions and relations:

$\ldots \leftrightarrow \ldots$	`Relation`	$\ldots^*$	`Reflexive-transitive closure`
$\ldots \nrightarrow \ldots$	`Partial function`		
$\ldots \rightarrow \ldots$	`Total function`	$\ldots (\!\mid \ldots \mid\!)$	`Relational image`
$\ldots \rightarrowtail \ldots$	`Partial injection`	$\ldots \oplus \ldots$	`Functional overriding`
$\ldots \rightarrowtail \ldots$	`Injection`	$\ldots \lhd \ldots$	`Domain restriction`
dom $\ldots$	`Domain`	$\ldots \rhd \ldots$	`Range restriction`
ran $\ldots$	`Range`	$\ldots \lhd \ldots$	`Domain subtraction`
$\ldots \mapsto \ldots$	`maplet`	$\ldots \rhd \ldots$	`Range subtraction`
$\ldots^\sim$	`Relational inverse`		

Axiomatic descriptions:

Declarations
Predicates

Schema definitions:

SchemaName

Declaration
Predicates