Appendix

Some Notations

The following notations are used throughout this book.

General

- $X := Y$ means *X is defined to be (or, is interpreted as) Y*
- $X \leftrightarrow Y$ means *X corresponds to Y*
- $X \Leftrightarrow Y$ means *X if and only if Y*
- LHS means *left-hand-side*
- RHS means *right-hand-side*
- $\exists$ means *there exists*
- $\forall$ means *for all*
- $\checkmark$ means *ok*
-  means *not ok*

Concerning Sets

- $\emptyset$ means *the empty set*
- $\mathbb{R}$ means *the set of all real numbers*
- $\mathbb{R}^+$ means *the set of all positive real numbers*
- $[0, 1]$ means *the set of real numbers between* 0 *and* 1 *(inclusive)*
- $x \in X$ means *x is an element of X*
- $X \subseteq Y$ means *X is a subset of Y*
- $X - Y$ means *the set of all elements of X that are not in Y*
- $X \cong Y$ means *X is isomorphic to Y*
- $\{X \mid Y\}$ means *the set of all X such that Y holds*

Concerning Functions and Relations

- $x \mapsto y$ means *x is mapped to y*
- $f : X \to Y$ means *f is a function from set X to set Y*
- $f :: x \mapsto y$ means *function or relation f maps x to y*
- $f :: \begin{cases} x_1 \mapsto y_1 \\ x_2 \mapsto y_2 \\ \quad \vdots \\ x_n \mapsto y_n \end{cases}$ means *function (or relation) f maps ..., x_i to y_i, ...*
- $R :: \begin{cases} x_1 \mapsto Y_1 \\ x_2 \mapsto Y_2 \\ \quad \vdots \\ x_n \mapsto Y_n \end{cases}$ means *relation R maps ..., x_i to all $y_i \in Y_i$, ...*
- $f(a)$ means *those elements function (or relation) f maps to*

Concerning Diagrams

-  means *the empty diagram*
- 0 means *any zero diagram*