

Appendix B

Symbols used in the Thesis

Symbols for Primitive Types

symbol	meaning	first use
\mathbb{I}	set of integers	page 44
\mathbb{N}	set of natural numbers	page 43
\mathbb{R}	set of real numbers	page 44
\mathbb{R}^+	set of non-negative real numbers	page 60

Symbols used for the Definition of Trees

symbol	meaning	first use
T	rooted (type-value) tree	page 42
u, v, w	nodes in a tree	page 42
$u \rightsquigarrow v$	ancestor-descendant relationship of u and v	page 42
$T[u]$	subtree of T rooted at node u	page 42
α	value	page 59
ϕ	predicate	page 43
$\tau = (D, P)$	type	page 43
D	domain (set of values)	page 43
P	set of predicates	page 43
$\tau \prec \tau'$	τ is a supertype of τ'	page 43
$\tau \preceq \tau'$	τ is equal to or a supertype of τ'	page 44
\mathcal{T}	set of types	page 44

Symbols used for the Definition of the approxQL Semantics

symbol	meaning	first use
T_D	data tree	page 46
u_D, v_D, w_D	nodes in a data tree	page 47
Q	query	page 48
Q_i	subquery	page 48
\mathbb{Q}	separated representation of a query	page 50
\mathbb{Q}^*	closure of a query	page 62
T_Q	(transformed) query tree	page 48
u_Q, v_Q, w_Q	nodes in a (transformed) query tree	page 48
$T_Q \Rightarrow T'_Q$	basic transformation of T_Q to T'_Q	page 55
M	set of query modifiers	page 47

Symbols used for the Definition of the Query-Evaluation Framework

symbol	meaning	first use
T_E	expanded query representation	page 69
u_E, v_E, w_E	nodes in an expanded query representation	page 69
(u_D, c, \tilde{c})	node-cost tuple	page 78
c	cost (used in node-cost tuples)	page 78
\tilde{c}	backup cost (used in node-cost tuples)	page 78
$\sigma^{ct}[\tau, \phi, \alpha]$	selection operator	page 78
\bowtie^{ct}	join operator	page 79
$\bowtie_{c_d}^{ct}$	outerjoin operator	page 80
\sqcup^{ct}	union operator	page 80
\sqcap^{ct}	intersection operator	page 81
c_t	transformation cost (passed to operators)	page 79
c_d	deletion cost (passed to outerjoin operators)	page 80
\mathcal{P}	query-execution plan	page 84
$u_{\mathcal{P}}, v_{\mathcal{P}}, w_{\mathcal{P}}$	nodes in a query-execution plan	page 84

Symbols used for the Definition of the Schema-Driven Query-Evaluation Method

symbol	meaning	first use
T_P	path tree	page 110
u_P, v_P, w_P	nodes in a path tree	page 111
(u_P, c, \tilde{c}, N)	extended node-cost tuple	page 115
N	set of node-cost tuples (used in node-cost tuples)	page 115

Symbols used in the Algorithms for the Plan Operators

symbol	meaning	first use
L	list of node-cost tuples	page 132
$[]$	empty list	page 132
$ L $	number of entries in list L	page 132
$L[i]$	i th entry in L ($1 \leq i \leq L $)	page 132
$L[i, j]$	interval of entries limited by the indices i and j	page 132

Symbols used for Complexity Analyses

symbol	meaning	first use
d	maximum number of children of a query selector (query degree)	page 105
k	number of second-level queries	page 139
l	maximum length of an operand list	page 139
m	maximum number of nodes in a second-level query	page 139
n	number of query selectors (query size)	page 105
p	number of permitted permutations for a query	page 105
r	maximum number of repeated values on a path (recursivity)	page 139
s	maximum number of occurrences of a value (selectivity)	page 140
s_D	selectivity in a data tree	page 140
s_P	selectivity in a path tree	page 140
v	maximum number of permitted value changes per query selector	page 105