Index

−, 17
∪, 17
⋉, 16
π, 17
σ, 17
×, 17
1NF, 29
2NF, 29
2PC, 83
2PC-UTRB, 89
2PL, 49
3NF, 29
3PC, 86
4NF, 29
5NF, 30
6NF, 30

abort, 13
ACA, 48
ACID properties, 10
aggregate operators, 21
aggregation, 22
aggressive, 52
always in future, 127
always in past, 127
anomalies, 42
asynchronously, 65
atomic commitment, 71, 83
Atomicity, 10
attribute, 15
attribute branch, 111
attributes, 109
autonomy, 61
avoids cascading aborts, 48
axes, 112
axis, 112

bag semantics, 20
balanced, 93
BAV, 65, 96
BCNF, 29
before images, 49
begin, 10, 13
binary, 93
blocked, 84
BM, 11
both as view, 65
both-as-view, 96
bottom-up design process, 62
bounded model, 124
Boyce-Codd Normal Form, 29
branching model, 124
buffer manager, 11

candidate key, 17, 29, 116
cascading abort, 48
CCR, 84
CDATA section, 110
CDM, 57
character data, 110
chronon, 123
closing tag, 109
clustered, 75
columns, 17
comma separated value, 8
command language, 9
commit, 10, 13
commitment, concurrency, and recovery, 84
committed projection, 44
common concepts, 92
common data model, 57
communication costs, 78
communication failure, 71
compatible, 47
complete, 13
complex type, 115
component databases, 59
component schema, 57, 59
concepts, 92
conceptual level, 9
conceptual modelling, 31
conceptual schema, 9
concurrency control, 10, 41
conflict, 46, 47, 93
conflict detection, 94
conflict equivalent, 46
conflict resolution, 94
conflict serialisable, 46
conservative, 52
conservative 2PL, 53

Consistency, 10
constraint, 96
construct, 92
context, 112
continuous model, 123
coordinator, 83
cost model, 72
CSR, 46
CSV, 8

data definition language, 9
data integration, 62, 65, 92
data manager, 12
data manipulation language, 9
data model, 7
data modelling language, 7
data warehouse, 60, 92
database, 7
database administrator, 9
database management system, 8
database management systems, 10
DBA, 9
DBMS, 8, 10
DDB, 57
DDBMS, 57
DDL, 9
deadlock, 53, 54
dependency, 28
derived horizontal fragmentation, 62
determinant, 29
difference, 17
dirty read, 48
discrete linear bounded, 123
discrete model, 123
distributed data independence, 58
distributed database, 57
distributed DBMS, 57
DM, 12
DML, 9
document type definition, 114
double index, 75
drill down, 22
DTD, 114
Durability, 10

edge schema, 119
election, 84
element, 109
element branch, 112
element schema, 119
end, 13
end of file, 55
entity reference, 110
Entity Relationship, 31
entity-relationship model, 91
EOF, 55
equivalent, 45
equivalent schemas, 96
ER, 31
ER Model, 91
export schema, 59
extensible mark-up language, 109
external level, 9
external schema, 9, 59

FD, 28
federated database, 60
federated multi-DBMS, 61
federated schemas, 59
fetch, 11
fifth normal form, 30
filtered, 91
filters, 24
first normal form, 29
flat files, 8
flush, 11
FLWOR, 113
for let where order return, 113
foreign key, 118
fourth normal form, 29
fragments, 62
fully locked, 51
functional dependency, 28

GAV, 65
generators, 24
GLAV, 65
global as view, 65
global local as view, 65
global queries, 69
global schema, 58
global schemas, 61
global transaction manager, 69
global transactions, 69
growing phase, 50
GTM, 69

HDB, 57
heterogeneous database, 57
homogeneous, 61
homonyms, 98
horizontal fragmentation, 62
hybrid fragmentation, 64

inconsistent analysis, 43
integration step, 93
intermediate query language, 24
internal level, 8

intra-query parallelism, 64
IQL, 24
Isolation, 10

JD, 29
join, 16, 72, 78
    lossless, 64
    natural, 16
    semi, 16
    since, 125
    until, 125
join dependency, 29

ladder, 93
LAV, 65
LDM, 69
linear model, 124
list comprehension, 24
livelock, 53
livelocks, 54
local as view, 65
local data manager, 69
local scheduler, 69
local schema, 57
local transaction manager, 69
locks, 49
logical distribution, 59
look-across, 34
look-here, 34
loosely coupled, 61
lost update, 42
LS, 69
LTM, 69

many-many, 35
mappings, 65
marking-up, 109
materialised global schema, 60
media failures, 12
mediator, 60
merging strategy, 93
migrate, 62
missing information, 20
multi-DBMS, 57, 61
multi-valued dependency, 28
multidimensional, 23
MVD, 28

n-ary, 93
next, 127
node test, 112
non-blocking, 86
non-recoverable execution, 48
normalisation, 29
null, 20
null value, 20

object role modelling, 31
objects, 13
OLAP, 21
    relational, 21
OLTP, 21
one-many, 35
one-one, 35
online analytical processing, 21
online transaction processing, 21
opening tag, 109
operational distribution, 59
operations, 13
optimistic concurrency control, 49
ORM, 31

pages, 11
partial virtual global schema, 60
path expression, 112
pathway, 96
phantom read, 43
physical heterogeneity, 57
pivot, 24
plans, 12
predicate, 55
predicate locking, 55
predicates, 24
previous, 127
primary copies, 65
primary key, 29
primary-backup, 80
primitive transformation, 96
processing instructions, 111
product, 17
    since, 125
    until, 125
project, 17

QP, 71
query optimisation, 12, 72
query plan, 76
query processing, 65
query processor, 71

RA, 15
RC, 48
RDBMS, 15, 17
read locks, 50
read-write conflicts, 80, 81
recoverable, 47, 48
recovery, 11
recovery manager, 12

redundancy, 28
related concepts, 93
relation, 15
relational algebra, 15
relational DBMS, 15, 17
relational OLAP, 21
relationally complete, 16, 24
replicated, 62
resource managers, 83
RM, 12
ROLAP, 21
rollback, 13
rolldown, 22
rollup, 22

scheduler, 12
schema, 8, 15
schema conforming, 94
schema improvement, 94
schema integration, 58, 62, 65, 92
schema merging, 94
schema transformation, 95
scheme, 24, 96
second normal form, 29
select, 17
select project join, 19
semantic heterogeneity, 57
semi-join, 16
semi-join method, 78
semi-structured data, 8
Sequel, 17
serial, 44
serialisable, 45
server, 83
shrinking phase, 51
simple type, 115
since, 124
single index, 75
single-DBMS, 61
sites, 57
sixth normal form, 30
snapshot, 123
sometime in future, 127
sometime in past, 127
SPJ, 19
SQL, 15, 17
  AVG, 21
  COUNT, 21
  CREATE, 17
  CREATE UNIQUE INDEX, 17
  CROSS JOIN, 19
  CUBE, 23
  DATENAME, 24
  DECLARE, 25
  DISTINCT, 20, 22
  EXCEPT, 17, 20
  FALSE, 20
  GROUP BY, 21
  IS, 20
  IS NOT, 20
  IS NOT NULL, 21
  IS NULL, 21
  JOIN, 18
  MAX, 21
  MIN, 21
  NATURAL JOIN, 19
  PRIMARY KEY, 29
  ROLLUP, 23
  SELECT, 17
  STDDEV, 21
  SUM, 21
  TRUE, 20
  UNION, 17, 20
  UNION ALL, 20
  UNION DISTINCT, 20
  UNIQUE, 29
  UNKNOWN, 20
  VARIANCE, 21
SQL-Server, 2
ST, 49
stable storage, 11
state-machine, 80
step expression, 112
strict, 49
strict 2PL, 53
structured data, 8
structured query language, 15, 17
stylesheets, 111
subset entity, 32
superset entity, 32
Sybase, 2
synchronously, 65
synonyms, 98
system failures, 12

tables, 17
tags, 109
temporal database, 123
temporal normal form, 127
temporal relational algebra, 125
temporary tables, 24
theta join, 16
third normal form, 29
three-phase commit, 86
tightly coupled, 61
time-stamping, 49
TM, 12
TNF, 127

top-down design process, 62
TRA, 125
Transact-SQL, 2
transaction, 9, 10
transaction manager, 12, 69
transaction time, 123
transformed, 91
trivial MVD, 29
two-phase commit, 83
two-phase locking, 49

UML, 31
unbalanced, 93
unbounded model, 124
unfederated multi-DBMS, 61
unified modelling language, 31
uniform timed reliable broadcast, 89
union, 17
    compatible, 17
union compatible, 62
universe of discourse, 7
unknown, 20
unstructured-data, 8
until, 124
UoD, 7
US logic, 124
UTRB, 89

valid time, 123
vertical fragmentation, 64
view, 65
view equivalent, 45
view integration, 92
view serialisable, 46
virtual global schema, 60
volatile storage, 11
VSR, 46

waits-for graph, 54
WFG, 54
workflow, 60
wrapper, 57
write locks, 50
write-locks-all, 80
write-write conflicts, 80, 81

XML, 109
XML declaration, 111
XML document, 109
XML Schema, 115
XPath, 111
XPath tree, 111
XQuery, 113