

Index

Symbols

ϵ -leakage 529

A

access method 268
 access paths 176, 177, 178, 179, 180
 accuracy 389, 391, 394
 active replication 763
 analysis coherence 132
 answer set programming (ASP) 799, 804
 APEX 675
 application server layer 866
 approximate similarity queries 293, 296
 archical clustering algorithms 618
 archiveSIC 637
 arrays 15
 artificial intelligence 233, 235, 236
 aspect-oriented database engineering 87
 atomic commit protocols 742
 automatic memory management 757
 autonomic computing 754
 AXL files 304

B

balanced signature tree 650
 Berners-Lee, Tim 419
 bi-clustering 566
 bianchi reengineering 37, 39, 40, 42, 901
 bind-variable SQL 884, 890
 bind but dynamic (BBD) technique
 886, 887, 888, 889

bioinformatics text mining (BTM) 619
 bit-slice file 646
 bit-slice signature file 654
 Boolean satisfiability problem (SAT) 799, 804
 Boolean SOs 77
 bottom concept 180
 bounded cardinality 12, 16, 12
 brute force checking 336, 366
 business intelligence (BI) 861
 business process 224, 238, 959
 butterfly approach 38, 43, 972

C

cache hit ratio 760
 cache miss ratio 760
 caching 253
 cardinality 12, 13, 15, 16, 17, 957
 cardinality, bounded 12, 13, 15, 17
 case 352, 356
 CASE tool 181, 186, 187
 certification-based replication 764
 change sets 96
 Chicken Little approach 38, 43
 Chinese philosophy to knowledge discovery in
 databases 632–643
 class diagrams 12
 classification task 595
 client/server information systems 252–259
 closed world assumption (CWA) 18
 cluster analysis 550, 552, 553, 573, 574
 clustering 616, 618, 665, 666, 667, 668,
 669, 670, 671, 672, 912, 913, 916,
 940, 941, 964

clustering algorithms 296
 Coalescing 34, 35, 902
 CODASYL 186
 code injection 882, 890
 collection type 169
 commonsense reasoning, interactive model 606
 commonsense reasoning process, machine learning 605–611
 commonsense reasoning rules (CRRs) 607
 completeness 388, 389, 391, 394
 complex systems 797
 composite data quality assessment 381
 compressed bit-slice file 646
 computer-aided design (CAD) 269, 307
 concept, primitive dimensionality 175
 concept, rank of 175
 concept-oriented models 171
 concept-oriented models, two-level 174
 concept graphs 175
 concepts, bottom 175, 176
 concepts, primitive 171, 174, 175, 176
 concepts, top 175, 180
 conceptual conversion strategy 43
 conceptual model design 231
 conceptual multidimensional model 55
 conceptual normalization 187
 concurrency control 365
 concurrent engineering 85
 configuration, index and materialized view 693, 694, 695, 696, 697
 consistent answer 363
 consistent database 346, 364, 416
 constraint 164
 constraint checking 346, 347
 constraint logic programming (CLP) 804
 Constraint Programming (CP) 799, 801, 803, 804, 920
 constraint propagation 178
 constraints, declarative 13, 15
 constraints, procedural 13
 constraints, semantic 14
 constraints checking 335–347
 constraint simplification 348, 349, 351, 352, 353, 355, 356, 357, 910, 954
 content-based data quality assessment 394

content-centric networks 797
 context-independent 388, 390, 393
 contextual data quality assessment 394
 continuous queries 296, 297, 922
 control protocols 762, 763
 corporate politics 216
 cryptography 527, 533, 534, 924
 currency 389, 391, 394

D

data-intensive mobile applications 863
 Database Administration Policy 87
 database administrators (DBAs) 693, 753, 694
 database consistency 365, 375
 database enrichment 280
 database evolution 98
 database issues 217
 Database Maintenance Policy 87, 89
 database maintenance supervised by administration (DBA) 85
 database management systems (DBMSs) 260, 694, 696, 697
 database models 83, 85, 86
 database physical conversion 38, 41
 database queries 217
 database reengineering 37, 38, 42, 934
 database refactoring 105, 108
 database repair 364
 database reverse engineering 181, 182, 185, 187, 188, 189, 928, 929, 953
 databases 734, 735, 736
 databases, consistent 416
 databases, inconsistent 416
 database schema 91, 92, 93, 94, 97, 98, 100, 101, 964
 database state 335
 database systems (DBS) 860
 data clustering 562–572, 581–588
 data clustering techniques 563
 data coherency 255
 data cubes 694, 699, 962
 data integration 364, 460, 465, 469, 471, 480
 data integration 461–470, 471, 482
 data integration, ontology-based 473
 data items 174

- datalog with unstratified negation (DATA-LOG \neg) 798, 799, 801, 803
data migration: 442
data mining 296, 298, 547, 548, 555, 560, 574, 578, 579, 696, 697, 892, 953
data mining to ontologies 509
data model 28, 29, 32, 34, 35, 913, 964
data modeling 171
data perturbation 529
data processing 601
data quality 385
data quality assessment 378–384
data quality assessment, problems 379
data sources layer 866
data stream clustering 567
data stream query processing 702
data streams 701, 702, 704, 705, 709, 710, 712, 714, 715, 897
data streams, mining of 702, 711, 713, 922
data streams, synopsis techniques for 704, 710
data suppression 528, 531, 533, 535, 958
data suppression, partial 528
data suppression techniques, generalization 528, 535, 958
data task 591
data utility 394
data warehouse (DW) 45, 56, 87, 89, 716, 717, 721, 724, 725, 726, 727, 933
data warehouses, and business-driven approach 66
data warehouses, and combined approach 66
data warehouses, and source-driven approach 66
data warehouses, and user-driven approach 66
data warehouses, requirements specifications 65–73
data warehouse systems (DWS) 860
DB built-in functions 890
DBTime 755
de-optimization 187
de-projection 176
decision making 716, 718, 726
decision support 716, 726
decision support system 727
declarative constraint support 16
deduction 553, 921
Degrib 305
delegate 763, 764, 765, 768
delegate replica 763, 764, 765, 768
density-based clustering 564
deprojection 176, 180
description logics (DLs) 435
differential feedback, need of 599
differential learning expert system 597–604
differentially fed neural networks 598
digital elevation models (DEM) 403
dimension 46, 55, 180
dimensionality reduction 298
dimension historization 132
dimensions, inverse 175
dimensions, primitive 175
dimensions, rank of 175
direct acyclic graph (DAG) 101
direction 160
disjoint/overlap relationship constraints 2
disjunctive datalog program 804
disk access 735, 736
disk page 736
distance function 298, 736
distributed data sources 589, 595
distributed DBMS 347
distributed hash tables (DHTs) 797
distributed information system 480
distributed real-time database system (DRT-DBS) 737, 742, 769
document schema 665, 673
document summarization 666, 667, 668, 670
document versioning 137–144
domain ontologies 511, 512
domains 175
dualities 172

E

- electoral databases 216
electoral systems, confidentiality 218
electrocardiography 191
emptiness, in Chinese 634
encoding injected statements 885, 890
enterprise resource planning system 238
entity modelling 173
entity relationship (ER) model 1

entity relationship diagram (ERD) 12, 13, 14
 ERP systems 221, 222, 225, 231, 234, 235, 236, 238, 970
 evolutionary data modeling 108
 example-based outlier mining 561
 exclusion protocol 583
 expert systems 597
 extended ER (EER) model 1
 extensible markup language (XML) 667, 668, 669, 670, 671, 672, 673, 891, 899, 908, 912, 913, 916, 920, 926, 940, 941, 949, 953, 964, 971, 973

F

falso quodlibet 355
 feature-based spatial queries (FBSQ) 271
 feature extraction 666
 feature service 305
 federated database 219, 471, 480
 federated information system (FIS) 480
 federation processes 160
 file transfer protocol (FTP) 301, 304, 305
 filter-refinement processing 293, 298
 financial data analysis 295
 firm real time transaction 742
 force and energy, in Chinese 635
 foreign key constraint 361, 364
 formal concept analysis 184
 four-way tree 262
 functional dependency 190, 360, 361, 364
 function call injection 882, 890
 fuzzy clustering 566
 fuzzy functional dependence 190

G

gene chip 617
 gene expression 617, 618, 619, 620
 gene mapping 621
 generalization / specialization relationships 2
 gene regulation 621
 generic and progressive algorithms for continuous mobile queries (GPAC) 864
 genes 573, 574, 575, 576, 578, 579, 580, 896, 921, 924, 934, 966, 972, 973
 genetic algorithms (GAs) 558, 559, 561
 genomes 573, 578, 917

genotype 621
 geographic information community (GIC) 497
 geographical information systems (GIS) 269, 279, 307, 481, 489, 951
 geography markup language (GML) 327
 geometric quality in geographic information 396–402
 GeoNode 280
 geospatial information system (GIS) 300, 301, 302, 303, 305, 306, 891, 908, 924, 938, 961, 968
 geospatial service interfaces 327
 good diagnostic test concept 607
 good diagnostic tests, inductive inference 607
 granularity 700
 grid-based clustering 565
 grid computing 720, 721, 726, 727, 897, 912, 921, 942, 966
 grid metrics 717, 718, 719, 720, 722, 727
 grid monitoring 721, 726, 897, 912
 Guanxi 635

H

hackers 881
 hand-OLAP system 865
 heterogeneity 472, 481, 482, 488, 489, 490, 928, 969
 heterogeneous data integration 461
 heterogeneous information system 480, 490
 hierarchical clustering 564
 hierarchies 47
 hierarchies, simple 47
 hierarchy 49, 51, 55
 Hierarchy-R 552
 high availability 762
 high throughput data acquisition technologies 589
 hoarding 254
 homogenous temporal relation 35
 horizontal data partitioning 199–207
 horizontal partitioning in data warehouses 202
 horizontal partitioning methodology 204

I

I/O cost 736
 iceberg distance join 277

identity modelling 173
IF SAR correlation problem 404
IF SAR DEM control 403–409
Image Service 306
impartial data quality assessment 394
imprecise functional dependencies 191
inconsistency 351, 352, 356, 348
inconsistency tolerance 350, 351, 352, 353, 354, 355, 356
inconsistent database 358, 362, 363, 364, 415, 925
indexable Web 582, 583, 585, 587, 588
indexing algorithm 736
indexing schemes 288
indexing tuning 756
index maintenance 754
index selection, problems with 694, 699, 938
indices 693, 694, 695, 696, 697, 698, 699, 734, 735, 736, 893, 908, 919, 921, 926, 938
inductive queries 521, 522
inference 553
information retrieval (IR) techniques 805, 806, 807, 808, 809, 807, 809, 810, 811, 812, 813, 814, 912
information retrieval (IR) techniques, peer-to-peer (P2P) 806, 807, 811, 813
information systems, biological 575, 576
integration operator 360, 364
integration process 482, 483, 484, 485, 486, 487, 488, 489, 963
integrity 348, 351, 354, 355, 356, 348, 914, 942, 945
integrity constraint 153, 356, 345, 346, 347, 411, 413, 416, 932
integrity control 347
integrity satisfaction 349, 356
integrity tests 339, 347, 366, 367, 368, 369, 370, 371, 372, 373
integrity violation 348, 356
interactive model of commonsense reasoning 606
interferometry SAR (IF SAR) 403
Internet map services (IMS) 300, 301, 302, 303, 304, 305, 306

interoperability 491, 492, 493, 494, 495, 496, 497, 498, 502, 503, 504, 505, 506, 896, 901, 903, 907, 939, 940, 951, 962, 963, 964
Inverse Dimension 180
K
k-anonymity 528, 535, 943, 958
k-n-match query 296
KDD using ontologies cycle 510
KMeans-R 551
k nearest neighbor (kNN) query 318, 319, 320, 321, 322
knowledge discovery 518, 519, 524, 525, 903, 904, 928, 949
knowledge discovery process in databases (KDD) 508, 518
knowledge extraction 598
L
LCS distance 736
learning from data 591
learning task decomposition 595
legacy data 37, 38, 39, 40, 41, 43, 44
legacy information system 181
level 51, 55
linear vector space, multi-aspect data qualities 380
linkcell-based data management 245
linkcell construct 240–251
linkcell size selection 247
local constraint checking 347
location-aware linkcell (LAL) 242
location-aware query processing 240–251
location-based services 324
location repository management problem 241
logical navigation 176
Logical representation 52, 55
M
Machine learning (ML) 589, 594, 595, 916, 947
mapping categories 8
mapping discovery 482, 484, 487
map service 306

- materialized views 693, 694, 696, 698, 700, 895, 968
 mechanisms, search 808, 809, 815, 817, 935
 mediator 461, 465, 469, 492, 493, 494, 497, 498, 499, 500, 501, 503, 506, 963
 memory buffer 754, 761
 memory management 757
 memory optimization 757
 merging 96
 metadata ontologies 511, 512
 metasearch engines 809, 815, 946
 metric 727
 metric database 736
 metric space 735, 736
 microarray 573, 574, 575, 576, 577, 578, 579, 580, 617, 618, 621, 902, 929, 930, 957, 967, 972
 minimal orthogonal bounding rectangle (MBR) 271
 mobile clients 252–259
 mobile process component 160
 modal SOs 77
 model-based clustering 565
 model-driven development 145–153
 model updating 131, 133
 MoGATU 863
 monitoring 716, 717, 718, 720, 727
 moving object tracking 295
 MRtree 263
 multi-aspect data qualities in a linear vector space 380
 multi-document summarization 279
 multi-representation 97, 99, 101, 904
 multidimensional model 64
 MultiDim model 46, 58
 multilevel signature file 647, 654
 multimedia information systems (MIS) 269, 307
 multiple inheritance 9
 multiplicity constraints 145, 147, 148, 153
 Multiset 16
 multisets 13, 14
- N**
- National Digital Forecast Database (NDFD) 300, 303, 305, 306
 national spatial data infrastructure (NSDI) 301
 National Weather Service (NWS) 301, 303, 304, 306
 nearest neighbor queries (NNQ) 272
 nested table 169
 network edge 317, 318, 320, 321, 322, 324
 network vertex 320, 321
 node subsumption 663
 notation, formal 40, 41, 42
 NP datalog logic language 798, 799, 800, 801, 802, 803
 NP optimization problem 799
 NP search problem 804
 numbering scheme 676
 numbering scheme-based indices 676
- O**
- object-relational data model 163, 169
 object-relational impedance mismatch 162
 object-relational modeling 169, 974
 object identifier 163
 observer system 475
 online analytical processing (OLAP) 56, 87, 119, 700, 716, 717, 716, 717, 721, 722, 724, 725, 726, 727, 861, 901
 online stock trading 769
 ontological changeability 480
 ontological commitments 507
 ontologically-based information system 239
 ontological reusability 480
 ontological scalability 480
 ontologies 434, 435, 436, 437, 439, 440, 441, 442, 494, 495, 496, 499, 500, 501, 502, 503, 504, 505, 507, 670, 671, 895, 896, 910, 912, 920, 926, 930, 935, 937
 ontologies, hybrid approach 500
 ontologies to data mining 508
 ontology 434, 442, 469, 473, 475, 479, 478, 471, 480, 475, 479, 480, 491, 494, 497, 500, 504, 505, 506, 507, 907, 918, 920, 926, 969
 ontology mapping 469, 489, 490, 935
 ontology matching 480
 ontology merging 450, 483, 490
 ontology population 442

open geospatial consortium (OGC) 326
OpenGIS consortium 493, 497, 498, 503
OpenJUMP 284
open world assumption (OWA) 18
optimization programming language (OPL)
 799, 801, 802, 803, 804, 968
optimization schema construct 189
Oracle8 165
ORION model 104
ORM (object-role modeling) 1
outlier mining 556, 561
outlier mining, example-based 556, 561
outlying subspace 561, 555
OWL lite 424
OWL ontology 425

P

pagination method 736, 728
paraconsistent realtions, algebraic operators 20
paraconsistent relational data model 18–27
paraconsistent relational data model, constraints
 and storage 25
paraconsistent relations 19
partitioned logging 787
partitioning clustering 563
party databases 216
pattern matching 666
PDEM, description 398
PDEM, how to employ 399
peer-to-peer (P2P) networks 805, 806, 807,
 808, 809, 810, 806, 810, 805, 806,
 805, 810, 806, 807, 808, 810, 811,
 812, 813, 814, 815, 816, 817,
 891, 902, 903, 912, 937, 940, 942,
 949, 958, 975
peer-to-peer (P2P) systems
 410, 411, 413, 414, 415
Peer-to-peer network 816
Peer-to-peer protocol 817
percolation theory 797
perpendicular distance estimation method
 (PDEM) 404
phenotype 621
PHP/MySQL development tool 576, 577
platform specific model 153
PMRquadtree 262

points, query 319, 320, 321, 324
points of interest 324
political databases 215
politically oriented database applications
 214–220
politics, role 214
Posttest 350, 357
Pretest 351, 357
primary copy replication 764, 765
primitive concept 180
principal component analysis (PCA) 549, 553
privacy preserving data mining (PPDM)
 527, 528, 530, 531, 532, 533
process-sensitive software engineering environment (PSEE) 154
process component 155
process component delegation 160
process level model 239
process modeling 155
product 160
profile models 85, 86, 87
projection 176, 180
PSEE, ability 157
PSEE, background 157
PSEE, capability 157
PSEE, ModelType 157
PSEE, participant 156
PSEE artifacts 155
pseudorandom generator 531, 536

Q

quasi-identifier 528
query engines 812, 813
query engines, peer-to-peer (P2P) 813
query languages 520
query optimizers 812, 816, 975
query reformulation 108
query schemes for mobile databases 860–871
query strategies 806
quorum 763

R

R* tree 263, 548, 549, 550, 551, 552, 553
random sampling 561
random variables 530
range, specified 12

- range query 734
REA ontology 222, 227, 229, 230, 231, 232, 233, 235, 236, 239
redundant data, managing 253
referenceable table 169
reference DEM (R-DEM) 396
reflexive relation 16
relation 16, 17
relation-theoretic operators 21
relational database (RDB) schema 435, 436, 437, 441
relational database management system (RD-BMS) 880, 890
relational to ontology (RONTOP) 435, 436, 437, 439, 440, 441, 442
relations, reflexive 16
relationship 16, 970
relationships, symmetric 13, 14
replication 254
resource 817
resource description framework (RDF) 420
resources-events-agents (REA) 222, 239
reverse engineering 85
robots 583
role 160
rollback operation 35
RTDCRS 772
rule extraction 601
- S**
- S-tree 647, 654
sampling 530
sampling, random 558
schema 113, 114, 115, 117, 118, 935, 940, 956
schema, conceptual 181, 182, 184, 185, 187, 188, 189, 907
schema changes 104, 108, 117, 118, 935
schema evolution 93, 98, 99, 100, 101, 103, 108, 119, 120, 121, 130, 132, 136, 897, 904, 909, 920, 921, 934, 942, 946, 953, 970, 971
schema evolution management 120
schema evolvability 104
schema level consistency 118
schema matching 442
- schema matching 435, 436, 437, 440, 441, 442, 915
schema modification 103, 109, 120
schema property 118
schemas, logical 181, 184, 185, 186, 187, 189
schema versioning 103, 109
Scientific databases 296
SDA, defined 77
SDA, principles 79
secondary storage 736
secure coprocessor 534, 917
secure multiparty computation 527, 530, 536
segmentation 281
self-manageable database 761
self-tuning database 761
self-tuning database management systems 753–761
semantically modeled database 239
semantic conflict 498, 500, 501
semantic constraint 16
semantic heterogeneity 480, 491, 494, 502, 503, 505, 507, 928
semantic integration 469
semantic integrity constraints 365, 367
semantic integrity subsystem 366, 375, 376, 932
semantic interoperability 494, 495, 503, 504, 506, 507, 901, 963
semantic metadata 499
semantic network 450
semantic operators 451
semantics, canonical 171, 176
semantics, primitive 176
semantics-based search techniques (SemSTs) 811
semantic similarity 496, 502, 505, 934, 956, 959
semantic Web tools, for ontologies construction 418–433
semi-supervised clustering 567
sensor network monitoring 295
sensor networks 796, 797, 893
sequence alignment 621
sequential engineering 85
sequential logging 787

- sequential pattern discovery methods 626
sequential pattern mining 622–631
sequential patterns, discovery 624
sequential patterns, restriction 625
sequential signature file 654
service 327, 328, 329, 330, 333
set-theoretic operators 20
Shamir's secret sharing scheme 528
Shapley value 533
shared GIS server 497
shi (energy) for scientific enterprise 636
signature file 645
signature file techniques 644–654
signature identifier 654
signatures 654, 973
signature tree 649, 654
similarity, degree of 436, 437, 440, 441, 442, 949, 952
similarity detection 667
similarity measure 442
similarity query 298, 736
similarity retrieval 552, 554
similarity search 735
simple hierarchies 47
simplification method 357
small world models 797
snapshot isolation 764, 765
snowflake schema 55
SO concept, semantics 78
SO defined 77
software projects 155
software requirements 471
space lattices 557, 558, 559, 561
spatial access method 293
spatial aggregate queries (SAQ) 271
spatial data 261, 325–334, 490
spatial database 307, 309
spatial database engine (SDE) 302, 306
spatial database system (SDBS) 269
spatial data clearinghouses 301, 302
spatial data infrastructure 327
spatial data integration 327
spatial data types 278
spatial data warehouse 57, 64
spatial dimension 64
spatial fact relationship 64
spatial hierarchy 64
spatial index 554
spatial level 64
spatial measure 64
spatial network databases 324
spatial networks 316, 318, 319, 322, 323, 324, 937, 951
spatial relationship 283
spatio-temporal query 268
specified range 17
SQL-92 12, 14
SQL:1999 163
SQL:2003 standard 146
stable-model semantics 804
star and snowflake schema 46
star schema 55
statistical database 536
stereotype 164
stored data 92, 101
streaming time series 288, 299
structural summary-based indices 675
structured P2P network 817
structured query language (SQL) injection attacks 880, 881, 883, 884, 885, 886, 889, 890, 895, 907, 920, 934, 936, 937, 941, 951
subspace 556, 557, 558, 559, 560, 561, 892
subspace, outlying 556, 557, 558, 559, 561
subspace clustering 566
sufficient statistics 591
summarization 530, 536
summarization 530, 531, 533
super-peer 817
suppression 528, 536
SWIFT 737–743
symbolic data analysis (SDA), principles 74–81
symbolic data tables 75
symbolic object (SO) 74
symmetric relation 17
system empirical design 189
system failure 787
- T**
- tabular data representation 530
task level model 239

temporal atom 29
temporal data, representing 29
temporal database 35
temporal database management 28–36
temporal data model 35
temporal data object 787
temporal element 35
temporal relations 30
temporal relations, designing of 32
termination 146, 153
text clustering 567
text filtering 282
text indexing methodology 644
the coherence problem 129
threshold query 296
time granularity 35
time interval 35
time series 288–299
time series, similarity search in 290
time series, streamining 288
tool 160
top concept 180
trajectory 266, 268, 941
transactional data 670
transaction time 36
transcript 621
transformation rules 149
tree embedding 656, 663
tree encoding 657, 664
tree pattern query 664
tree tuples 670
triangular inequality 291
triggering graph 147
two-phase-locking (2PL) 762
two phase commit (2PC) 738

U

U.S. National Oceanic and Atmospheric Administration (NOAA) 301, 303, 304
unstructured P2P network 817

untranslation 187
update 357
user's layer 866
user-defined types (UDTs) 163, 169
user-driven approach 132

V

valid time 29, 36
Value chain 239
varray 15, 166
vector-space models 669
version derivation 101
versioning-view 101
version management, approaches 139
very large scale integration design (VLSI) 269, 307
virtual organization 727
visualizations, interactive 575
voting technique 763

W

weak-voting replication 764
Web ontology language (OWL) 423
wide spectrum language (WSL)
37, 40, 41
workloads 693, 694, 695, 696, 697, 700
Wrapper 333, 462, 470

X

XBR tree 263
XML (eXtensible Markup Language) 419, 674
XML databases, and query evaluation 655–664
XML databases, indices in 674–681
XML document 664
XML document versioning 140
XML in digital libraries 137–144
XML schema 664
XPath expression 664