

Index

A

- Adding semantics to the current Web, *see* Semantic markup
- Add machine-understandable meanings, 14
- AI, 156
- Amazon Web Services, 3
- Ambiguity
 - ambiguity of XML document, 82
 - semantic ambiguity, 27
- Anonymous node, *see* Blank node
- Anonymous resource, *see* Anonymous node
- Artificial Intelligence, *see* AI
- Automatic
 - information extraction, 388

B

- Base
 - in-scope base URI, 57
 - turtle base keyword, 66–69
 - xml base attribute, 57
- Berners-Lee, Tim, 15
- Binary relationship, 39
- Blank node, 36, 38
 - local identifier, 39
 - n-ary relationship, 39
- bnode, *see* Blank node
- Breadth-first search, 534
- Brickley, Dan, 292

C

- Camera ontology in OWL 1, 192
- Camera ontology in OWL 2, 233
- Camera ontology written in RDFS, 132
- Collections in RDF, 61–63
- Common language in sharing information, 110
- Containers in RDF, 59–61
- Content negotiation, 417
- Crawler, 316

Create a FOAF document, 303

- Creator, in DC(Dublin Core) metadata schema, 80
- cURL, 434
- Cyganiak, Richard, 431

D

- DAML+OIL, 156
- DAML, 156
- DARPA Agent Markup Language, *see* DAML
- Data integration, 1
- Data mining, 11
- DBpedia, 381
 - Berlin page, 391
 - core datasets, 401
 - datasets, 381
 - DBpedia URI, 395
 - extended datasets, 405
 - extractor, 388–389, 394
 - Federer page, 382
 - generic infobox extraction method, 395
 - links to RDF Bookmashup, 406
 - links to Wikicompany dataset, 405
 - look and feel, 385
 - mapping-based extraction approach, 395
 - as part of Linked Data, 406
 - persondata dataset, 404
 - RDF dumps, 401
 - RDF icon, 391
 - SAPRQL endpoint, 397
 - SPARQL viewer, 397
 - titles dataset, 404
 - URI lookup service, 408
 - using SPARQL to access DBpedia, 398–401
- DBpedia ontology, 390
 - access the ontology, 390
 - infobox attributes map to properties, 394–396

- infobox templates map to classes, 392–394
ontology dataset, 402
ontology infobox properties dataset, 403
ontology types dataset, 403
- DBpedia Project, 381
Depth-first search, 534
Dereferencable URIs, 29
Derefencing URIs, 29
Description Logic, *see* DL
Digital single lens reflex, *see* DSLR
DL, 226–227
Domain, 137
Domain model, 479
DSLR, 21
Dublin Core, 79
Dublin Core vocabulary, 79
Dynamic object model pattern, 483
- E**
EmailAddressCollector agent, 566
- F**
Facets, 211
Falcons, 441
concept search, 442
document search, 443
object search, 442
type pane, 442
- Federer, Roger, 381
- FOAF, 292
foaf:interest, 427
explorer, 302
foaf:, 293
foaf:Agent, 296
foaf:base_near, 428
foaf:depiction, 300
foaf:depicts, 300
foaf:Document, 296
foaf:firstName, 296
foaf:homepage, 296
foaf:Image, 296
foaf:knows, 298
foaf:mbox, 296
foaf:mbox_sha1sum, 298
foaf:name, 296
foaf:Organization, 296
foaf:Person, 295
foaf:Project, 296
in official language, 292–293
publish your FOAF document, 305–306
scutter, 302
vocabulary, 292
- FOAF Bulletin Board, 306
FOAF-a-matic, 303
- Follow-Your-Nose
build a Follow-Your-Nose agent, 536–543
method, 533
run a Follow-Your-Nose agent, 543–545
- Framework, 467
Friend of a Friend, *see* FOAF
- G**
Gleaning Resource Descriptions from Dialects of Languages, *see* GRDDL
- GRDDL, 105
link element, 106
with microformats, 106–107
profile attribute, 105
with RDFa, 107
- H**
Hash symbol, 419
Hash URI, 28, 419
Heath, Tom, 456
Hello World example, 497–498
- I**
Inference engine, 524
Information integration, *see* Data integration
Information resources, 414
Internationalized Resource Identifiers, *see* IRI
International Semantic Web Conference, *see* ISWC
IRI, 159
ISWC, 18
- J**
Jena, 468, 473, 492
add(), 507
addProperty(), 504
bindSchema(), 525
createDefaultModel(), 503–504, 508
createModelRDBMaker(), 517, 519
create RDF model, 502–507
createResource(), 504
createStatement(), 507
download Jena package, 492–495
FileManager class, 509
getId(), 511
getNsPrefixMap(), 511
getURI(), 511
inference model, 528
inferencing examples, 525–531
isAnon(), 511
listObjectsOfProperty(), 511
listResourcesWithProperty(), 511
listStatements(), 514
Literal class, 504
in-memory RDF models, 501

- ModelFactory, 503
ModelMaker class, 517
ModelRDB class, 517
multiple persistent RDF models, 522–524
OntModelSpec class, 529
persistent RDF model, 515
Property class, 504
RDFNode interface, 504
RDF/XML-ABBR parameter, 506
read a RDF model, 507–509
ReasonerRegistry class, 525
Resource class, 504
single persistent RDF model, 517–521
understand a RDF model, 510–515
using Jena in Eclipse, 495–497
- Joseki, 244
- K**
- Keyword-matching, 13
Knowledge Organization Systems, *see* KOS
Knowledge representation, *see* KR
KOS, 138
KR, 156
- L**
- Linked Data, 16, 409
accessing the Web of Linked Data, 445
application example, 456–463
basic principles, 412
creating links, 427–433
creating links manually, 431
discover, 441
generating links automatically, 433
minimal requirements, 434
pattern-based algorithms, 433
publishing linked data on the Web, 436–438
size of, 411–412
use SPARQL to access the Web of Linked Data, 451
validator, 438
- Linked Data browsers, 410, 445
- Linked Data cloud, 451
- Linked Open Data, *see* LOD
- Linking Open Data Community Project, 412
- LOD, 409
- LOD cloud, 431
- M**
- Mashup, 411, 463
McBride, Brian, 468
MediaWiki, 334
Microformats, 88
- hCard microformat, 89
and RDF, 94–95
syntax and examples, 89–94
- Model-view-controller, *see* MVC architecture
- Musicbrainz, 451
SPARQL endpoint, 451
- Music Ontology, 424
- MVC architecture, 479
- MySQL, 516
Command Line Client, 517
Connector/J, 516
JDBC driver, 516
port number, 516
setup, 516
- N**
- Negation as failure, 282
- NeOn, 476
OWL editor, 476
Toolkit, 476
- Nikon D300, 22
- Non-information resources, 415
- O**
- OIL, 156
- Ontology, 137
Ontology development methodology, 484–489
basic steps, 487
basic tasks and fundamental rules, 485
bottom-up approach, 486
combination approach, 486
top-down approach, 486
- Ontology driven architecture, *see* Ontology-driven software development method
- Ontology-driven software development method, 482
- Ontology engineering environment, 474
- Ontology header, 219
- Ontology Inference Layer, *see* OIL
- OWL, 159
cardinality constraints, 165
Direct Model-Theoretic Semantics, 226
in official language, 156–158
from OWL 1 to OWL 2, 158–159
in plain English, 155–156
qualified cardinality constraints, 196
RDF-based Semantics, 226
value constraints, 165
- OWL 1, 157
annotation property, 215
imports and versioning, 219
OWL 1 DL, 227–229
OWL 1 Full, 227–228
OWL 1 Lite, 227, 229

- owl:AllDifferent, 225
- owl:allValuesFrom, 165
- owl:AnnotationProperty, 216
- owl:cardinality, 170
- owl:Class, 161
- owl:complementOf, 174
- owl:DatatypeProperty, 180
- owl:differentFrom, 224
- owl:disjointWith, 117
- owl:distinctMembers, 225
- owl:equivalentClass, 176, 224
- owl:FunctionalProperty, 189
- owl:hasValue, 168
- owl:imports, 220
- owl:intersectionOf, 172
- owl:InverseFunctionalProperty, 192
- owl:inverseOf, 190
- owl:maxCardinality, 171
- owl:minCardinality, 171
- owl:ObjectProperty, 180
- owl:oneOf, 175
- owl:onProperty, 165
- owl:Ontology, 220
- owl:Restriction, 165
- owl:sameAs, 222
- owl:sameIndividualAs, 223
- owl:someValuesFrom, 167
- owl:SymmetricProperty, 185
- owl:Thing, 161
- owl:TransitiveProperty, 186
- owl:unionOf, 173
- owl:versionInfo, 221
- reasoning based on cardinality constraints, 171–172
- reasoning based on class enumeration, equivalent and disjoint, 177
- reasoning based on functionality property, 189
- reasoning based on inverse functional property, 191–192
- reasoning based on inverse property, 189–190
- reasoning based on owl:allValuesFrom, 166–167
- reasoning based on owl:hasValue, 170
- reasoning based on owl:someValuesFrom, 167–168
- reasoning based on set operators, 174
- reasoning based on symmetric property, 185
- reasoning based on transitive property, 186–187
- specifications, 156
- OWL 2, 157
 - axiom, 159
 - axiom annotation, 217
 - entities, 159
 - entity declaration, 218
 - expressions, 159
 - Functional-Style syntax, 160
 - imports and versioning, 221
 - keys, *see* OWL 2, owl:hasKey
 - Manchester syntax, 160
 - metamodeling, *see* OWL 2, punning
 - negative fact assertions, 199
 - OWL 2 DL, 230
 - OWL 2 EL, 230
 - OWL 2 Full, 230
 - OWL 2 QL, 230–231
 - OWL 2 RL, 230, 232
 - OWL 2 specifications, 157
 - owl:AllDisjointClasses, 197
 - owl:AllDisjointProperties, 206
 - owl:annotatedProperty, 217
 - owl:annotatedSource, 217
 - owl:annotatedTarget, 217
 - owl:assertionProperty, 200
 - owl:AsymmetricProperty, 205
 - owl:Axiom, 217
 - owl:datatypeComplementOf, 213
 - owl:disjointUnionOf, 198
 - owl:hasKey, 209
 - owl:hasSelf, 201
 - owl:intersectionOf, 213
 - owl:IrreflexiveProperty, 204
 - owl:maxQualifiedCardinality, 203
 - owl:minQualifiedCardinality, 202
 - owl:NegativeDataPropertyAssertion, 199
 - owl:NegativeObjectPropertyAssertion, 199
 - owl:onDatatype, 212
 - owl:propertyDisjointWith, 206
 - owl:qualifiedCardinality, 203
 - owl:ReflexiveProperty, 204
 - owl:sourceIndividual, 200
 - owl:targetIndividual, 200
 - owl:unionOf, 213
 - owl:versionIRI, 221
 - owl:withRestrictions, 212
- OWL/XML, 161
- property chain, 207
- punning, 214
- RDF/XML syntax, 160
- reasoning based on cardinality restrictions, 203
- reasoning based on disjoint property, 207
- reasoning based on key, 210

reasoning based on property chain, 209
reasoning based on reflexive, irreflexive
and asymmetric property, 205
reasoning based on self restriction property,
201
supported datatypes, 211
syntactic sugar, 197
top and bottom properties, 219

P

Page snippet, 319
Pellet, 472
Plug-in architecture, 477
Point And Shoot, 112
Property-value pair, 3
Protégé, 475
 OWL API, 476
 Programming Development Kit, 476
Protocol and RDF Query Language, *see*
SPARQL

Q

QName, 30
Qualified name, *see* QName

R

RacerPro, 472
RDF
 abstract model, 25–42
 basic rule #1, 25
 basic rule #2, 27
 basic rule #3, 75
 datatype URI, 37
 definition, 20
 graph, 26
 graph structure of a statement, 26
 implementation of the RDF abstract model,
 26
 language tag, 37
 literals, 37
 long form of RDF/XML syntax, 56
 Notation-3, 65
 N-triples, 65
 object, 26
 in official language, 19–21
 in plain English, 21–25
 predicate, 63
 property, 35
 property value, 36
 rdf, 42
 rdf:about, 44
 rdf:Alt, 59
 rdf:Bag, 59
 rdf:datatype, 52

 rdf:Description, 44
 rdf:first, 61
 rdf:ID, 56
 rdf:li, 60
 rdf>List, 61
 rdf:nil, 61
 rdf:nodeID, 55
 rdf:object, 63
 rdf:parseType, 51
 rdf:predicate, 63
 rdf:RDF, 42–43
 rdf:resource, 44
 rdf:rest, 61
 rdf:Seq, 59
 rdf:statement, 63
 rdf:subject, 63
 rdf:type, 45
 rdf:value, 50
 RDF/XML syntax, 42
 reification of a statement, 63
 reification vocabulary, 63
 resource, 27
 resource XML node, 44
 serialization syntax, 42
 short form of RDF/XML sterilization, 58
 statement, 25
 subject, 26
 triple, 26
 typed literal value, 37
 typed node, 45
 typed node element, *see* RDF, typed node
 un-typed literal value, 37
 validator, 84
 vocabulary, 42
 W3C specifications, 10
RDFa, 96
 attributes and elements, 96–97
 examples, 99–104
 and RDF, 104
 rules of markup, 97–99
RDF Bookmashup, 406
RDF data store, 243
RDFS, 111
 in official language, 110–111
 in plain English, 109–110
 rdfs, 114
 rdfs:Class, 114
 rdfs:comment, 132
 rdfs:Datatype, 129
 rdfs:domain, 120
 rdfs:isDefinedBy, 132
 rdfs:label, 132
 rdfs:Literal, 129

- rdfs:range, 120
- rdfs:Resource, 114
- rdfs:seeAlso, 131
- rdfs:subClassOf, 117
- rdfs:subPropertyOf, 126
- rdfs:XMLLiteral, 130
- reasoning based on RDFS ontology, 149–151
- W3C recommendation, 110–111
- RDF Schema, *see* RDFS
- RDF/S, *see* RDFS
- RDF-S, *see* RDFS
- RDF triple store, 243
- Reasoner, 471, 524
 - inference process, 471
 - reasoning, 471
- Redland, 470
- Relationship between Linked Data and the Semantic Web, 17
- Remote SPARQL query, 553
- Resource Description Framework, *see* RDF
- Revyu, 456
- Rich Snippets, 319
 - aggregate review, 321
 - individual review, 321
 - microformats supported, 322
 - ontologies supported, 322
- Testing Tool, 322

- S**
- SameAs, 422
- Sampras, Pete, 394
- Screen-scraping, 573
- Search engine, 315
 - anchors, 317
 - barrels, 317
 - basic flow, 315
 - crawling, 316
 - indexer, 317
 - indexing, 317
 - links, 317
 - PageRanking, 317
 - rank, 317
 - repository, 317
 - searching, 317
 - seed URLs, 316
 - sorter, 317
 - store server, 317
 - URL Resolver, 317
 - URL server, 316
- SearchMonkey, 323
- badge, 328
- creating presentation applications, 327
- DataRSS, 325
- Enhanced Result, 327
- high level architecture, 325
- Infobar, 327
- microformats supported, 329
- online development tool, 328
- ontologies supported, 329
- Page custom data service, 326
- Search Gallery, 328
- testing tool, 329
- trigger URL, 328
- Web Service custom data service, 326
- XSLT Custom Data Service, 326
- Semantic annotation, *see* Semantic markup
- Semantic annotation in wiki, 335
 - link, 339
 - text, 343
- Semantic markup, 308
 - automatic markup, 313
 - manually markup, 313
 - procedure and example, 308–312
- Semantic mashups, 411
- Semantic MediaWiki, 334
 - Additional printouts, 350
 - built-in datatypes, 344
 - Factbox, 347
 - inferencing, 356
 - inferencing based on category hierarchy, 358
 - inferencing capability based on property hierarchy, 358
 - logical AND, 351
 - logical OR, 353
 - Page type, 345
 - Property, 342
 - query language, 350
 - RDF feed, 362
 - reuse existing ontologies, 372
 - semantic browsing interface, 348
 - Semantic wiki vocabulary and terminology, *see* SWiVT
 - Special:Ask, 350
 - sub-query, 354
 - SWiVT, 360
 - swvt:BuiltinType, 361
 - swvt:CustomType, 362
 - swvt:page, 361
 - swvt:Subject, 360
 - swvt>Type, 361
 - swvt:Wikipage, 360
 - type, 344
 - Semantics, 9, 14
 - The Semantic Web, 15, 17

- Semantic Web development methodologies, 478–484
Semantic Web search engines, 441, 478
Semantic Web vs. Linked Data, 410
Semantic wiki, 334
Sesame, 469
SHOE, 156
ShopBot, 573
ShopBot on the Semantic Web, 583
Sig.ma, 446
Simple HTML Ontology Extensions, *see* SHOE
Simple Knowledge Organization Systems, *see* SKOS
Sindice, 422, 443
Sindice's Data Web Services API, 443
Single Lens Reflex, *see* SLR
SKOS, 138
 skos, 142
 skos:altLabel, 143
 skos:broadMatch, 144
 skos:closeMatch, 148
 skos:Concept, 143
 skos:ConceptScheme, 146
 skos:definition, 144
 skos:exactMatch, 148
 skos:example, 144
 skos:hasTopConcept, 147
 skos:hiddenLabel, 143
 skos:historyNote, 144
 skos:inScheme, 146
 skos:narrower, 144
 skos:narrowMatch, 148
 skos:note, 144
 skos:prefLabel, 143
 skos:related, 144
 skos:relatedMatch, 148
 skos:scopeNote, 144
 specifications, 142
Slash URI, 28
SLR, 21
Smart agent, 2
SMORE, 312
SPARQL 1, 277
SPARQL 1.1 Query, 278
 AS, 283
 aggregate functions, 278
 count() aggregate function, 279
 expressions with SELECT, 283
 MINUS operator, 282
 negation, 281
 NOT EXISTS operator, 282
 projected expressions, 283
 property paths, 285
 sample() aggregation function, 280
 Subquery, 280
 sum() aggregate function, 279
SPARQL 1.1 Update, 285
 DELETE DATA operation, 287
 DELETE operation, 288
 graph creation, 289
 graph management, 286
 graph remove, 289
 INSERT DATA operation, 286
 INSERT operation, 287
 LOAD and CLEAR operation, 289
 SILNET keyword, 290
SPARQL, 241–242
 alternative match, 264
 ask query, 249, 275
 background graph, 267
 BASE directive, 252
 basic SELECT queries, 252–257
 bind, 250
 binding, *see* SPARQL, bind
 FROM clause, 252
 CONSTRUCT query, 249, 372
 DESCRIBE query, 249, 275
 distinct modifier, 260
 endpoint, 244
 filter keyword, 261
 functions and operators, 263
 generic endpoints, 244
 graph pattern, 250
 named graphs, 267
 in official language, 241–242
 offset/limit modifiers, 261
 optional keyword, 257
 order by modifier, 260
 in plain English, 242–243
 PREFIX definitions, 252
 projection query, *see* SPARQL, SELECT query
 query modifiers, 253
 query solution, 259
 SELECT clause, 252
 SELECT query, 249, 252
 solution, 259
 specification, 241
 specific endpoints, 244
 triple pattern, 249
 union keyword, 264
 variable, 250
 WHERE clause, 252
 working with multiple graphs, 267–272

Spider, *see* Crawler

Structured information, 17

Swoogle, 445

SWSE, 444

Synsets, 295

T

Taxonomy, 139

Terse RDF Triple Language, *see* Turtle

Thesaurus, 139

TopBraid, 477

 Composer, 477

Turtle, 66

 @base, 68

 @prefix, 67

 <>, 66

 [], 71

 commas (,), 70

 semicolons, 70

 Token a, 69

 ttl, 66

Typed link, 411, 430

U

Uniform Resource Identifier, *see* URI

Uniform Resource Locator, *see* URL

303 URI, 416

URI, 28

URI aliases, 421–423

URIref, 28

URI reference, *see* URIref

303 URIs vs. hash URIs, 421

URL, 27

Use SPARQL to query in-memory RDF models, 549–553

Use SPARQL to query remote datasets, 553–556

V

Vapour, 438

Virtuoso, 469, 473

Virtuoso Universal Server, *see* Virtuoso

W

W3C Semantic Web activity, 18

W3C Semantic Web activity news web site, 18

W3C Semantic Web community Wiki page, 18

W3C Semantic Web frequently asked questions, 18

W3C Semantic Web interest group, 18

Web of Data, 17, 410

Web data mining, 11

Web of Linked Data, 409–411

Web 2.0 mashup, 463

Web Ontology Language, *see* OWL

Web services, 11

Well-known ontologies, 423

Wiki, 332

 category system, 335

 namespace, 336

 wiki engine, 332

 wikitext, 332

Wikicompany, 337

 namespaces, 337

 properties, 346

Wikipedia, 380

 infobox, 385

 template, 385

Wikipedia datasets, 401

WordNet, 295

X

XML entity, 53

Y

Yahoo! Slurp, 325