Index

A-Priori Algorithm, 210, 211, 217 B-tree, 278 Accessible page, 185 Babcock, B., 160, 278 Active learning, 444 Babu, S., 160 Ad-hoc query, 132 Backstrom, L., 400 Adjacency matrix, 361 Bag, 38, 74 Adomavicius, G., 338 Balance Algorithm, 291 Advertising, 16, 114, 202, 279 Balazinska, M., 68 Adwords, 288 Band, 86 Affiliation-Graph model, 369 Bandwidth, 20 Afrati, F.N., 68, 400 Basket, see Market basket, 200, 202, Agglomerative clustering, see Hierar-203, 232 chical clustering Batch gradient descent, 469 Aggregation, 32, 35 Batch learning, 443 Agrawal, R., 236 Bayes net, 4 Alon, N., 160 BDMO Algorithm, 269 Alon-Matias-Szegedy Algorithm, 144 Beer and diapers, 204 Amplification, 99 Bell, R., 339 Bellkor's Pragmatic Chaos, 308 Analytic query, 51 AND-construction, 99 Berkhin, P., 198 Anderson, C., 338, 339 Berrar, D.P., 435 Andoni, A., 127 Betweenness, 349 ANF, see Approximate neighborhood BFR Algorithm, 252, 255 function BFS, see Breadth-first search ANF Algorithm, 394 Bi-clique, 355 Bid, 289, 291, 298, 299 Apache, 22, 69 Approximate neighborhood function, 394BigTable, 68 Arc, 384 Bik, A.J.C., 69 Archive, 130 Binary Classification, 438 Ask, 190 Biomarker, 203 Bipartite graph, 285, 345, 355, 356 Association rule, 203, 205 Associativity, 25 BIRCH Algorithm, 278 Attribute, 31 Birrell, A., 69 Auction, 291 Bitmap, 218, 219 Block, 11, 19, 178 Austern, M.H., 69 Authority, 190 Blog, 186 Average, 142 Bloom filter, 138, 216

Bloom, B.H., 160 Cloud computing, 15 Blum, A., 481 CloudStore, 22 Bohannon, P., 68 Cluster computing, 19, 20 Boldi, P., 400 Cluster tree, 264, 265 Bonferroni correction, 5 Clustera, 39, 67 Bonferroni's principle, 4, 5 Clustering, 3, 16, 239, 323, 341, 347, Bookmark, 184 437 Clustroid, 244, 250 Boral, H., 401 Borkar, V., 68 Collaboration network, 344 Bottou, L., 481 Collaborative filtering, 4, 17, 73, 279, Bradley, P.S., 278 305, 319, 345 Breadth-first search, 349 Column-orthonormal matrix, 417 Brick-and-mortar retailer, 202, 306, 307 Combiner, 25, 175, 177 Brin, S., 198 Communication cost, 20, 45, 382 Broad matching, 291 Community, 341, 352, 355, 379 Broder, A.Z., 18, 127, 198 Community-affiliation graph, 369 Bu, Y., 68 Commutativity, 25 Bucket, 9, 135, 150, 154, 216, 269 Competitive ratio, 16, 284, 287, 292 Budget, 290, 297 Complete graph, 355, 356 Compressed set, 256 Budiu, M., 69 Compute node, 19, 20 Burges, C.J.C., 481 Burrows, M., 68 Computer game, 313 Computing cloud, see Cloud comput-Candidate itemset, 213, 226 ing Concept, 418 Candidate pair, 86, 217, 220 Carey, M., 68 Concept space, 423 Categorical feature, 438, 478 Confidence, 204, 205 Centroid, 241, 244, 250, 253, 257 Content-based recommendation, 305, Chabbert, M., 339 310 Chandra, T., 68 Convergence, 449 Chang, F., 68 Cooper, B.F., 68 Characteristic matrix, 79 Coordinates, 240 Charikar, M.S., 127 Cortes, C., 482 Chaudhuri, S., 127 Cosine distance, 93, 103, 311, 316, 424 Checkpoint, 44 Counting ones, 148, 269 Chen, M.-S., 236 Covering an output, 57 Child, 349 Craig's List, 280 Cholera, 3 Craswell, N., 303 Chronicle data model, 159 Credit, 350 Chunk, 22, 226, 256 Cristianini, N., 481 Cross-Validation, 443 CineMatch, 335 Classifier, 316, 437 Crowdsourcing, 444 CUR-decomposition, 403, 426 Click stream, 131 Click-through rate, 283, 289 CURE Algorithm, 260, 264 Clique, 355 Currey, J., 69

Curse of dimensionality, 242, 266, 476, Display ad, 280, 281 Distance measure, 90, 239, 347 479 Cut. 360 Distinct elements, 140, 143 Cyclic permutation, 85 Distributed file system, 19, 21, 200, Cylinder, 12 207 DMOZ, see Open directory Czajkowski, G., 69 Document, 72, 75, 203, 240, 299, 311, DAG, see Directed acyclic graph 312, 440 Darts, 138 Document frequency, see Inverse doc-Das Sarma, A., 68 ument frequency Dasgupta, A., 401 Domain, 188 Data mining, 1 Dot product, 93 Data stream, 16, 230, 268, 282, 458 Drineas, P., 434 Data-stream-management system, 130 Dryad, 67 Database, 16 DryadLINQ, 68 Datar, M., 127, 160, 278 Dual construction, 346 Datar-Gionis-Indyk-Motwani Algorithm, Dubitzky, W., 435 149 Dumais, S.T., 434 Dead end, 165, 168, 169, 191 Dup-elim task, 41 Dean, J., 68, 69 Decaying window, 155, 232 e, 12 Decision tree, 316, 441, 442, 479 Edit distance, 93, 96 Deerwester, S., 434 Eigenpair, 404 Degree, 357, 379 Eigenvalue, 165, 362, 403, 414, 415 Eigenvector, 165, 362, 403, 409, 414 Degree matrix, 361 Dehnert, J.C., 69 Email, 344 del.icio.us, 312, 345 Energy, 422 Deletion, 93 Ensemble, 317, 479 Dense matrix, 29, 426 Entity resolution, 108 Density, 249, 251 Equijoin, 32 Depth-first search, 391 Erlingsson, I., 69 Determinant, 405 Ernst, M., 68 DeWitt, D.J., 69 Ethernet, 19, 20 DFS, see Distributed file system Euclidean distance, 91, 105, 475 Diagonal matrix, 417 Euclidean space, 91, 95, 240, 241, 244, Diameter, 249, 251, 386 260 Diapers and beer, 202 Exponentially decaying window, see De-Difference, 31, 34, 38 caving window Dimension table, 51 Extrapolation, 474 Dimensionality reduction, 326, 403, 476 Directed acyclic graph, 349 Facebook, 184, 342 Directed graph, 384 Fact table, 51 Discard set, 256 Failure, 21, 27, 40–42 Disk, 11, 207, 241, 264 Faloutsos, C., 401, 435 Disk block, see Block False negative, 86, 97, 225

5.	Q
False positive, 86, 97, 138, 225	Gionis, A., 127, 160
Family of functions, 98	Girvan, M., 401
Fang, M., 236	Girvan-Newman Algorithm, 349
Fayyad, U.M., 278	Global minimum, 328
Feature, 264, 310–312	GN Algorithm, see Girvan-Newman Al-
Feature selection, 444	gorithm
Feature vector, 438, 478	Gobioff, H., 69
Fetterly, D., 69	Golub, G.H., 434
Fikes, A., 68	Google, 162, 173, 288
File, 21, 22, 207, 225	Google file system, 22
Filtering, 137	Google+, 342
Fingerprint, 111	Gradient descent, 334, 371, 465
First-price auction, 291	Granzow, M., 435
Fixedpoint, 100, 190	Graph, 43, 55, 341, 342, 378, 385
Flajolet, P., 160	Greedy algorithm, 282, 283, 286, 290
Flajolet-Martin Algorithm, 141, 393	GRGPF Algorithm, 264
Flow graph, 39	Grouping, 24, 32, 35
Fortunato, S., 400	Grouping attribute, 32
Fotakis, D., 400	Groupon, 345
French, J.C., 278	Gruber, R.E., 68
Frequent bucket, 217, 219	Guha, S., 278
Frequent itemset, 4, 200, 210, 212, 356,	Gunda, P.K., 69
437	Gyongi, Z., 198
Frequent pairs, 211	
Frequent-items table, 212	Hadoop, 22, 69
Freund, Y., 482	Hadoop distributed file system, 22
Friends, 342	Hamming distance, 65, 94, 102
Friends relation, 50	Harris, M., 336
Frieze, A.M., 127	Harshman, R., 434
Frobenius norm, 407, 421	Hash function, 9, 77, 81, 86, 135, 138,
Furnas, G.W., 434	141
, ,	Hash key, 9, 298
Gaber, M.M., 18	Hash table, 9, 10, 12, 209, 216, 219,
Ganti, V., 127, 278	220, 298, 300, 379
Garcia-Molina, H., 18, 198, 236, 278,	Haveliwala, T.H., 198
401	HDFS, see Hadoop distributed file sys-
Garofalakis, M., 160	tem
Gaussian elimination, 166	Head, 390
Gehrke, J., 160, 278	Heavy hitter, 379
Generalization, 443	Henzinger, M., 127
Generated subgraph, 355	Hierarchical clustering, 241, 243, 261,
Genre, 310, 322, 336	324, 347
GFS, see Google file system	Hinge loss, 464
Ghemawat, S., 68, 69	HITS, 190
Gibbons, P.B., 160, 401	Hive, 68, 69
, , , ,	• •

Hopcroft, J.E., 391 Jaccard similarity, 72, 80, 90, 185 Horn, H., 69 Jacobsen, H.-A., 68 Howe, B., 68 Jagadish, H.V., 160 Hsieh, W.C., 68 Jahrer, M., 339 Jeh, G., 401 Hub, 190 Hyperlink-induced topic search, see HITSJoachims, T., 482 Hyperplane, 459 Join, see Natural join, see Multiway Hyracks, 39 join, see Star join, 381 Join task, 41 Identical documents, 116 Identity matrix, 405 K-means, 252 IDF, see Inverse document frequency K-partite graph, 345 Image, 131, 311, 312 Kahan, W., 434 Kalyanasundaram, B., 304 IMDB, see Internet Movie Database Imielinski, T., 236 Kamm, D., 336 Immediate subset, 228 Kang, U., 401 Immorlica, N., 127 Kannan, R., 434 Important page, 162 Karlin, A., 284 Impression, 280 Kaushik, R., 127 In-component, 167 Kautz, W.H., 160 Kernel function, 471, 475 Inaccessible page, 185 Independent rows or columns, 417 Key component, 135 Index, 10, 379 Key-value pair, 23–25 Indyk, P., 127, 160 Keyword, 289, 317 Initialize clusters, 253 Kleinberg, J.M., 198 Input, 55 Knuth, D.E., 18 Insertion, 93 Koren, Y., 339 Instance-based learning, 441 Kosmix, 22 Krioukov, A., 69 Interest, 204 Internet Movie Database, 310, 336 Kumar, R., 18, 69, 198, 401 Kumar, V., 18 Interpolation, 474 Intersection, 31, 34, 38, 75 Label, 342, 438 Into Thin Air, 309 Inverse document frequency, see TF.IDF, Lagrangean multipliers, 49 Landauer, T.K., 434 Lang, K.J., 401 Inverted index, 162, 280 Ioannidis, Y.E., 401 Laplacian matrix, 362 IP packet, 131 LCS, see Longest common subsequence Isard, M., 69 Leaf, 350 Isolated component, 168 Learning-rate parameter, 446 Leiser, N, 69 Item, 200, 202, 203, 306, 322, 323 Item profile, 310, 313 Length, 144, 385 Itemset, 200, 208, 210 Length indexing, 117 Leskovec, J., 400–402 Jaccard distance, 90, 92, 98, 311, 477 Leung, S.-T., 69

Likelihood, 367	Martin, G.N., 160
Lin, S., 127	Master controller, 23, 24, 26
Linden, G., 339	Master node, 22
Linear equations, 166	Matching, 285
Linear separability, 445, 449	Matias, Y., 160
Link, 31, 162, 176	Matrix, 29, see Transition matrix of
Link matrix of the Web, 191	the Web, see Stochastic ma-
Link spam, 181, 185	trix, see Substochastic matrix,
Littlestone, N., 482	175, 190, see Utility matrix,
Livny, M., 278	326, see Adjacency matrix, see
Local minimum, 328	Degree matrix, see Laplacian
Locality, 342	matrix, see Symmetric matrix
Locality-sensitive family, 102	Matrix multiplication, 36, 37, 60
Locality-sensitive function, 97	Matrix of distances, 415
Locality-sensitive hashing, 86, 97, 312,	Matthew effect, 14
477	Maximal itemset, 210
Log likelihood, 372	Maximal matching, 285
Logarithm, 12	Maximum-likelihood estimation, 367
Long tail, 202, 306, 307	McAuley, J., 402
Longest common subsequence, 94	Mean, see Average
Lower bound, 59	Mechanical Turk, 444
LSH, see Locality-sensitive hashing	Median, 142
	Mehta, A., 304
Machine learning, 2, 316, 437	Melnik, S., 401
Maggioni, M., 434	Merging clusters, 244, 247, 258, 262,
Maghoul, F., 18, 198	267, 271
Mahalanobis distance, 259	Merton, P., 18
Mahoney, M.W., 401, 434	Miller, G.L., 401
Main memory, 207, 208, 216, 241	Minhashing, 79, 89, 92, 99, 312
Malewicz, G, 69	Minicluster, 256
Malik, J., 401	Minsky, M., 482
Manber, U., 127	Minutiae, 111
Manhattan distance, 91	Mirrokni, V.S., 127
Manning, C.P., 18	Mirror page, 73
Many-many matching, 111	Mitzenmacher, M., 127
Many-many relationship, 55, 200	ML, see Machine learning
Many-one matching, 111	MLE, see Maximum-likelihood estima-
Map task, 23, 25	tion
Map worker, 26, 27	Model, 367
Mapping schema, 56	Moments, 143
MapReduce, 15, 19, 22, 28, 175, 177,	Monotonicity, 210
227, 273, 381, 388, 456	Montavon, G., 481
Margin, 459	Moore-Penrose pseudoinverse, 427
Market basket, 4, 16, 199, 200, 207	Most-common elements, 155
Markov process, 165, 168, 375	Motwani, R., 127, 160, 236, 278

Mueller, KR., 481	On-line advertising, see Advertising
Multiclass classification, 438, 453	On-line algorithm, 16, 282
Multidimensional index, 476	On-line learning, 443
Multihash Algorithm, 220	On-line retailer, 202, 280, 306, 307
Multiplication, 29, see Matrix multi-	Open directory, 182, 444
plication, 175, 190	OR-construction, 99
Multiset, see Bag	Orr, G.B., 481
Multistage Algorithm, 218	Orthogonal vectors, 242, 408
Multiway join, 47, 381	Orthonormal matrix, 417, 422
Mumick, I.S., 160	Orthonormal vectors, 409, 412
Mutation, 96	Out-component, 167
,	Outlier, 241
Name node, see Master node	Output, 55
Natural join, 32, 35, 36, 46	Overfitting, 317, 334, 441, 442, 455,
Naughton, J.F., 69	479
Navathe, S.B., 236	Overlapping Communities, 367
Near-neighbor search, see Locality-sens-	
itive hashing	Own pages, 186
Nearest neighbor, 442, 470, 479	
Negative border, 228	Paepcke, A., 127
Negative example, 445	Page, L., 161, 198
Neighbor, 374	PageRank, 3, 16, 29, 30, 40, 161, 163,
Neighborhood, 385, 393	175
Neighborhood profile, 385	Pairs, see Frequent pairs
Netflix challenge, 2, 308, 335	Palmer, C.R., 401
Network, see Social network	Pan, JY., 401
Neural net, 441	Papert, S., 482
Newman, M.E.J., 401	Parent, 349
Newspaper articles, 113, 299, 308	Park, J.S., 236
Non-Euclidean distance, 250, see Co-	Partition, 359
sine distance, see Edit distance	
see Hamming distance, see Jac	
card distance	Paulson, E., 69
Non-Euclidean space, 264, 266	PCA, see Principal-component analy-
Norm, 91	sis
Normal distribution, 255	PCY Algorithm, 216, 219, 220
Normalization, 319, 321, 332	Pedersen, J., 198
Normalized cut, 361	Perceptron, 437, 441, 445, 479
	Perfect matching, 285
NP-complete problem, 355	Permutation, 80, 85
Numerical feature, 438, 478	PIG, 68
O'Callaghan I 979	
O'Callaghan, L., 278	Pigeonhole principle, 355
Off-line algorithm, 282	Piotte, M., 339 Biretal condensation, 405
Olston, C., 69	Pivotal condensation, 405
Omiecinski, E., 236	Plagiarism, 73, 203

D + 60	D / : D 100 070
Pnuts, 68	Rastogi, R., 160, 278
Point, 239, 269	Rating, 306, 309
Point assignment, 241, 252, 348	Reachability, 387
Polyzotis, A., 68	Recommendation system, 16, 305
Position indexing, 119, 120	Recursion, 40
Positive example, 445	Recursive doubling, 389
Positive integer, 154	Reduce task, 23, 25
Powell, A.L., 278	Reduce worker, 26, 28
Power Iteration, 405	Reducer, 25
Power iteration, 406	Reducer size, 52, 58
Power law, 13	Reed, B., 69
Predicate, 316	Reflexive and transitive closure, 387
Prefix indexing, 117, 119, 120	Regression, 438, 475, 479
Pregel, 43	Regularization parameter, 464
Principal eigenvector, 165, 405	Reichsteiner, A., 435
Principal-component analysis, 403, 410	Reina, C., 278
Priority queue, 247	Relation, 31
Priors, 369	Relational algebra, 30, 31
Privacy, 282	Replication, 22
Probe string, 119	Replication rate, 52, 59
Profile, see Item profile, see User pro-	Representation, 264
file	Representative point, 261
Projection, 31, 34	Representative sample, 135
Pruhs, K.R., 304	Reservoir sampling, 160
Pseudoinverse, see Moore-Penrose pseu-	- Restart, 375
doinverse	Retained set, 256
Puz, N., 68	Revenue, 290
	Ripple-carry adder, 154
Quadratic programming, 465	RMSE, see Root-mean-square error
Query, 132, 151, 273	Robinson, E., 69
Query example, 471	Rocha, L.M., 435
	Root-mean-square error, 308, 327, 421
R-tree, 278	Rosa, M., 400
Rack, 20	Rosenblatt, F., 482
Radius, 249, 251, 385	Rounding data, 321
Raghavan, P., 18, 198, 401	Row, see Tuple
Rahm, E., 401	Row-orthonormal matrix, 422
Rajagopalan, S., 18, 198, 401	Rowsum, 264
Ramakrishnan, R., 68, 278	Royalty, J., 69
Ramsey, W., 303	
Random hyperplanes, 103, 312	S-curve, 87, 97
Random surfer, 162, 163, 168, 182, 374	Saberi, A., 304
Randomization, 224	Salihoglu, S., 68
Rank, 416	
	Sample, 224, 228, 231, 233, 253, 261,

Sampling, 134, 148 Social Graph, 342 Savasere, A., 236 Social network, 341, 342, 403 SCC, see Strongly connected compo-SON Algorithm, 226 Source, 384 Space, 90, 91, 239 Schapire, R.E., 482 Schema, 31 Spam, see Term spam, see Link spam, Schutze, H., 18 344, 443 Score, 109 Spam farm, 185, 188 Search ad, 280 Spam mass, 188, 189 Search engine, 173, 189 Sparse matrix, 29, 79, 81, 175, 176, 306 Search query, 131, 162, 184, 280, 298 Spectral partitioning, 359 Second-price auction, 291 Spider trap, 168, 171, 191 Secondary storage, see Disk Splitting clusters, 267 SQL, 20, 31, 68 Selection, 31, 33 Sensor, 131 Squares, 383 Sentiment analysis, 445 Srikant, R., 236 Set, 79, 116, see Itemset Srivastava, U., 68, 69 Set difference, see Difference Standard deviation, 257, 259 Shankar, S., 69 Standing query, 132 Shawe-Taylor, J., 481 Stanford Network Analysis Platform, Shi, J., 401 see SNAP Shim, K., 278 Star join, 51 Shingle, 75, 89, 114 Stata, R., 18, 198 Statistical model, 1 Shivakumar, N., 236 Shopping cart, 202 Status, 299 Shortest paths, 43 Steinbach, M., 18 Stochastic gradient descent, 334, 469 Siddharth, J., 127 Signature, 78, 81, 89 Stochastic matrix, 165, 405 Signature matrix, 81, 86 Stop clustering, 245, 249, 251 Silberschatz, A., 160 Stop words, 8, 77, 114, 203, 311 Silberstein, A., 68 Stream, see Data stream Similarity, 4, 15, 72, 199, 312, 320 Strength of membership, 372 Similarity join, 53, 59 String, 116 Simrank, 374 Striping, 30, 175, 177 Singleton, R.C., 160 Strong edge, 344 Singular value, 417, 421, 422 Strongly connected component, 167, 391 Singular-value decomposition, 326, 403, Strongly connected graph, 165, 386 416, 426 Substochastic matrix, 168 Six degrees of separation, 387 Suffix length, 121 Sketch, 104 Summarization, 3 Skew, 26 Summation, 154 Sliding window, 132, 148, 155, 269 Sun, J., 435 Smart transitive closure, 390 Supercomputer, 19 Smith, B., 339 Superimposed code, see Bloom filter, SNAP, 400 159

Supermarket, 202, 224 Tomkins, A., 18, 69, 198, 401 Superstep, 44 Tong, H., 401 Supervised learning, 437, 439 Topic-sensitive PageRank, 181, 188 Support, 200, 225, 226, 228, 230 Toscher, A., 339 Total Information Awareness, 5 Support vector, 460 Support-vector machine, 437, 442, 459, Touching the Void, 309 479 Training example, 438 Supporting page, 186 Training rate, 449 Suri, S., 401 Training set, 437, 438, 444, 454 Surprise number, 144 Transaction, see Basket Transition matrix, 375 SVD, see Singular-value decomposition Transition matrix of the Web, 164, 175, SVM, see Support-vector machine Swami, A., 236 176, 178, 403 Symmetric matrix, 363, 404 Transitive closure, 41, 387 Szegedy, M., 160 Transitive reduction, 391 Transpose, 191 Tag, 312, 345 Transposition, 96 Tree, 246, 264, 265, see Decision tree Tail, 390 Triangle, 378 Tail length, 141, 393 Tan, P.-N., 18 Triangle inequality, 91 Target, 384 Triangular matrix, 209, 218 Target page, 186 Tripartite graph, 345 Tarjan, R.E., 391 Triples method, 209, 218 Task, 21 TrustRank, 188 Taxation, 168, 171, 186, 191 Trustworthy page, 188 Taylor expansion, 12 Tsourakakis, C.E., 401 Taylor, M., 303 Tube, 168 Telephone call, 344 Tuple, 31 Teleport set, 182, 183, 188, 375 Tuzhilin, A., 338 Teleportation, 172 Twitter, 299, 342 Tendril, 167 Term, 162 Ullman, J.D., 18, 68, 69, 236, 278, 400 Term frequency, see TF.IDF, 8 Undirected graph, see Graph Term spam, 162, 185 Union, 31, 34, 38, 75 Test set, 442, 449 Unit vector, 404, 409 TF, see Term frequency Universal set, 116 TF.IDF, 7, 8, 311, 441 Unsupervised learning, 437 Theobald, M., 127 User, 306, 322, 323 Thrashing, 177, 216 User profile, 314 Threshold, 87, 157, 200, 226, 230, 445, Utility matrix, 306, 309, 326, 403 451 UV-decomposition, 326, 336, 403, 469 TIA, see Total Information Awareness Timestamp, 149, 270 VA file, 476 Toivonen's Algorithm, 228 Valduriez, P., 401 Toivonen, H., 236 Van Loan, C.F., 434

Yu, Y., 69

Zhang, H., 435

Zhang, T., 278

Zoeter, O., 303

Zipf's law, 15, see Power law

 $Vapnik,\ V.N.,\ 482$

Variable, 144

Vassilvitskii, S., 401

Vazirani, U., 304

Vazirani, V., 304

Vector, 29, 91, 95, 165, 175, 190, 191,

240

Vigna, S., 400

Vitter, J., 160

Volume (of a set of nodes), 361

von Ahn, L., 313, 339

von Luxburg, U., 401

Voronoi diagram, 471

Wall, M.E., 435

Wall-clock time, 47

Wallach, D.A., 68

Wang, J., 336

Wang, W., 127

Weak edge, 344

Weaver, D., 68

Web structure, 167

Weight, 445

Weiner, J., 18, 198

Whizbang Labs, 2

Widom, J., 18, 69, 160, 278, 401

Wikipedia, 344, 444

Window, see Sliding window, see De-

caying window

Windows, 12

Winnow Algorithm, 449

Word, 203, 240, 311

Word count, 24

Worker process, 26

Workflow, 39, 41, 45

Working store, 130

Xiao, C., 127

Xie, Y., 435

Yahoo, 289, 312

Yang, J., 401, 402

Yerneni, R., 68

York, J., 339

Yu, J.X., 127

Yu, P.S., 236