

Index

- abstract L_1 -space, 72
- adjacent, 5
- agglomerative approach, 236
- amalgamation, 217
- approximation, 230
- arc, 12

- bipartition, 2
- bridge, 7
- BUILD algorithm, 219
- Buneman complex, 168
- Buneman graph, 51
 - extended, 51

- C (-edge)-coloring, 66
- CAT(0)-space, 42
- certificate, 19
- cherry, 5
- child, 2
- clique, 19
- cluster, 1
 - Apresjan, 204
 - cluster graph, 219
 - cluster system, 196
 - clustering model
 - affine, 207
 - projective, 207
- code, 163
 - error correcting, 164
- color, 66
- component
 - connected, 6
- condition
 - 4-point, 16
 - local split-extendability, 173

- 3-point, 202
- 3-split, 173
 - very local split-extendability, 175
- consensus network, 227
- contractible, 15
- contraction
 - of a metric space, 14
 - of an edge in a graph, 9
 - of an X -tree, 23
- cover, 172
 - double, 172
 - simple, 172
- cut face, 59
- cut vertex, 7
- cycle
 - directed, 12
 - in a graph, 7
 - special type of graph, 7
- cycle space, 13
- cyclomatic number, 13

- define
 - a tree by a quartet system, 104
 - a tree by a set system, 114
 - a tree by a tree system, 117
- degree, 5
- difference set, 51
- display
 - a quartet, 27
- dissimilarity, 13, 202
 - hierarchical, 202
 - subdominant Δ -hierarchical, 231
 - subdominant hierarchical, 204
- distinguish
 - an edge by a quartet, 106
 - an edge by a set, 113

262

D-split, 149
 strong, 138
 strong partial, 138
 eccentricity, 32
 edge, 5
 interior, 5
 isolated, 7
 of a path, 6
 passed by a path, 6
 pendant, 5
 edge set, 4
 edge-cutset, 7
 embedding
 isometric, 14
 Kuratowski, 78
 endpoint
 of a path, 6
 of an edge, 5
 excess
 of a collection of sets, 114
 of a quartet system, 106
 expansion
 of an *X*-tree, 23
 face, 57
 of type Ξ , 57
 Farris transform, 209
 combinatorial, 207
 fitting linear order, 71
 forest, 9
 function
 edge-weight, 15
 Galois connection, 172
 γ -translate, 211
 gate, 15
 geodesic, 14
 graph, 4
 bipartite, 11
 complete multi-partite, 11
 connected, 6
 derived, 5
 finite, 4
 multi-partite, 11
 underlying, 12
 weighted, 15
 X-labeled weighted, 93
 graphs
 isomorphic, 5
 Hadamard conjugation, 228
 Hasse graph, 200

Index

hierarchy, 3
 maximal, 4
 homotopic, 14
 homotopy, 14
 hypercube, 11

 ideal, 54
 in-degree, 12
 incident, 5
 index
 Buneman, 138
 hyperbolicity, 213
 isolation, 146
 metric, 151
 ultrametricity, 213
 input size, 19
 isomorphism
 X-tree, 22

k-split, 2

 leaf, 5
 of a rooted *X*-tree, 197
 length
 of a path, 6
 level
 of a network, 220
 ℓ_1 -embeddability problem, 164
 loop, 88

 majority rule consensus tree, 226
 map
 bivariate, 13
 contracting, 9
 dating, 195
 Δ -hierarchical symmetric bivariate, 213
 generalized Kuratowski, 215
 Kuratowski, 75
 k-variate, 232
 symmetric bivariate, 13
 median
 in a metric space, 16
 in a tree, 8
 median graph, 63
 median hull, 63
 median space, 16
 metric, 14
 circular, 161
 Δ -hyperbolic, 79
 generalized, 215
 proper, 14
 totally split-decomposable, 150
 treelike, 33

- metric space, 14
 - bipartite, 72
 - finite, 14
 - geodesic, 14
 - injective, 75
 - proper, 14
- morphism
 - graph, 56
- neighbor, 5
- Neighbor-Joining, 236
- network, 9
 - level- k , 221
- non-negative least squares, 239
- NP-complete, 20
- n -set, 1
- object
 - injective, 82
- operator
 - Buneman, 141
 - split, 154
- oriented matroid, 167
- out-degree, 12
- pairwise separation property, 166
- part
 - of a partition, 2
- partial order, 2
- partition, 2
- path, 6
 - closed, 6
 - closed directed, 12
 - directed, 12
 - proper, 6
- power set, 1
- primitive pair, 72
- pseudoline, 167
- \mathcal{Q}^* -method, 236
- \mathcal{Q} -cherry, 172
- QNet, 240
- \mathcal{Q} -split, 172
 - strong, 191
- \mathcal{Q} -tree, 190
- quartet, 27
 - gap-free, 106
 - locally \mathcal{Q} -extendable, 193
- quartet system, 27
 - compatible, 105
 - definitive, 104
 - excess-free, 106
 - saturated, 43
 - sparse, 105
 - thin, 42
 - transitive, 43
 - weighted, 46
- quartet systems
 - isomorphic, 183
- Quartet-Joining, 236
- Quartet-Puzzling, 236
- quasi-median graph, 65
- rank
 - of an element, 205
- realization, 97
 - hereditarily optimal, 101
 - optimal, 100
- reduce
 - a problem to another, 20
- reduction, 20
- refinement
 - of a tree, 239
- restriction
 - of a metric space, 14
 - of a tree, 11
- retract, 14
- root
 - of a tree, 12
- run time, 19
- separate, 7
- set
 - connected, 6
 - convex in \mathbb{R}^X , 85
 - convex in a metric space, 15
 - gap-free, 113
 - partially ordered, 1
- set system, 1
 - excess-free, 114
 - gap-free, 114
 - k -cross-free, 223
 - slim, 114
- size
 - of a split, 2
- split, 2
 - extended partial, 139
 - partial, 138
 - trivial, 2
- split graph, 66
- split metric, 139

split network, 68
 proper, 68
 split prime, 154
 split system, 24
 affine, 165
 circular, 70
 compatible, 39
 full affine, 166
 incompatible, 52
 k -compatible, 222
 \mathcal{M} -independent, 165
 octahedral, 169
 weakly compatible, 149
 weighted, 41
 splits
 compatible, 39
 incompatible, 39
 starting point
 of a path, 6
 subgraph, 6
 induced, 6
 isometric, 15
 subset
 gated, 15
 subspace
 of a metric space, 14
 subtree, 7
 induced, 11
 super-network, 227
 super-tree problem, 121
 support
 of a quartet, 27
 of a weighted quartet system,
 46
 of a weighted split system, 41
 of an X -tree, 21
 support system, 106
 symmetric difference, 8
 tight equality graph, 87
 tight span, 75
 total weight
 of a realization, 100
 tree, 7
 augmented, 13
 binary, 8
 labeled, 21

partial, 227
 phylogenetic, 22
 phylogenetic star, 23
 rooted, 12
 star, 8
 underlying an X -tree, 21
 tree space, 42
 tree system, 114
 binary, 117
 definitive, 117
 excess-free, 117
 slim, 117
 trees
 compatible phylogenetic,
 117
 triangle inequality, 14
 generalized, 215
 triplet, 197
 triplet system, 196
 compatible, 219
 type
 of an edge, 56
 ultrametric, 202
 vertex, 5
 central, 8
 interior, 5
 isolated, 7
 of a path, 6
 passed by a path, 6
 reticulation, 220
 vertex set, 4
 vertex-cutset, 7
 X -net, 73
 proper, 73
 X -split, 24
 X -tree, 21
 binary, 22
 dated rooted, 195
 phylogenetic rooted, 197
 rooted, 195
 simple, 21
 weighted, 31
 X -trees
 isomorphic, 22