Math

#	Title	Difficulty
1	Matrix Exponentiation	1
2	FFT	2
3	NTT	2
4	Online NTT	3
5	FWHT	2
6	Lagrange Interpolation	2
7	Lagrange Interpolation with Polynomial Extraction	3
8	Polynomial Sum	3
9	Polynomial with Binomial Coefficients	3
10	Subset Sum Problem	3
11	Generating Functions	3
12	Polynomial Structure	3
13	Polynomial Factorization of (x^n - 1)	3
14	Berlekamp Messey	3
15	Reeds–Sloane Algorithm	3
16	Linear Recurrence using Cayley-Hamilton theorem	2
17	Linear Recurrence using Generating Functions	3
18	Linear Recurrence with Polynomial Coefficients	3
19	Linear Recurrence on Matrices	3
20	Generating Function of a Linear Recurrence	2
21	Gaussian Elimination	2
22	Gaussian Elimination under Modulo	2
23	Gaussian Elimination Modulo 2	2
24	Determinant under Prime Modulo	2
25	Determinant under Composite Modulo	2
26	Determinant of Product Matrix	3
27	Determinant of Sparse Matrix	3
28	Determinant of Permutant Matrix	3
29	Determinant of Cyclic Matrix	3
30	Cauchy–Binet formula	3
31	Thomas Algorithm	2
32	Inverse of a Matrix	3
33	Inverse of a Matrix modulo 2	3
34	Basis Vector	2
35	Basis Vector Reduced Row Echelon Form.	2
36	Basis Vector ft Weighted Linearly Independent Vectors.	2
37	Permanent of a Matrix	2
38	All Possible Perfect Matching XOR Values	2
39	Hafnian of a Matrix	3
40	Vandermonde Matrix	3

41	Freivalds Algorithm	3
42	Characteristic Polynomial Faster / Hesserberg Matrix	3
43	Faulhaber's Formula Fastest	3
44	Lagrange Multiplier	3
45	Titu's Lemma	2
46	Simplex Algorithm	3
47	Integration	2
48	Line Integral	2
49	The Slime Trick	3
50	Gauss's Eureka Theorem	2
51	LTE Lemma	2
52	Expected Value	1
53	Expected Value Powers Technique	2
54	Finite Field Arithmetic Binary	2
55	Max Convolution between Convex Funtions	2

Number Theory

#	Title	Difficulty
56	Binary Exponentiation	1
57	Modular Inverse	1
58	Sieve	1
59	Sieve upto 1e9	3
60	Extended Euclid	1
61	Combinatorics Basics	1
62	Lucas Theorem	1
63	nCr Modulo Any Mod	2
64	Prefix Sum Queries of nCi	2
65	Sum of nCi over a Fixed Congruence Class	2
66	"Sum of nCr(a(i) k) for each k from 1 to n"	2
67	Sum of nCi for a Fixed Large n	3
68	Phi Function	1
69	Power Tower	2
70	Mobius Function	1
71	CRT	1
72	Linear Congruence Equation	1
73	Pollard Rho	2
74	Primitive Root	2
75	Multiplicative Order / Carmichael's Lambda Function	2
76	Discrete Log	2
77	Discrete Root	2

78	Discrete Root in $O(p^{(1/4)})$ using Tonelli-Shanks Algorithm	3
79	Number of Distinct Kth Powers Modulo n	3
80	Number of Solutions to $x^2 = 1 \bmod m$	2
81	Tonelli Shanks Algorithm	3
82	Pells Equation	3
83	Linear Diophantine Equation with Two Variables	1
84	Trivariable Linear Diophantine Equation with Nonnegative Solutions	3
85	Multivariable Linear Diophantine Equation with Nonnegative Solutions	3
86	Linear Diophantine With N Unknowns and Two Equations	3
87	Floor Sum of Arithmetic Progression	2
88	Generalized Floor Sum of Arithmetic Progression	3
89	Sum of Floors	1
90	Number of Nonnegative Integer Solutions to $ax+by \leq c$	3
91	Number of $ax \% p$ in a Range	3
92	Smallest Nonnegative Integer x s.t. $l \leq ax \% p \leq r$	3
93	Prime Counting Function	2
94	K Divisors	3
95	Smallest Number Having Exactly K Divisors	2
96	Sum of The Number of Divisors in cbrt(n)	3
97	Linear Sieve for Multiplicative Functions	1
98	Min_25 Sieve	3
99	Mobius Inversion	2
100	Dirichlet convolution	2
101	Number of Solutions to a Basic Linear Algebraic Equation	1
102	Number of Solutions to a Basic Linear Algebraic Equation with Variable Upper Bound Constraints	3
103	Partition Function	3
104	Stirling Number of the First Kind for Fixed n	2
105	Stirling Number of the First Kind for Fixed k	3
106	Stirling Number of the Second Kind for Fixed n	2
107	Stirling Number of the Second Kind for Fixed k	3
108	Bell Number	2
109	LCM of Fibonacci Numbers	2
110	Phi Field	2
111	Pisano Period	3

112	Rational Approximation / Stern-Brocot Tree	3
113	Factoradic Number System	2
114	Intersection of Arithmetic Progressions	1
115	Continued Fractions	2
116	Maximum Coprime Product	2

Graph Theory

#	Title	Difficulty
117	DFS and BFS	1
118	0/1 BFS	1
119	Dial's algorithm	2
120	Inverse Graph	1
121	LCA	1
122	LCA in O(1)	2
123	SCC	1
124	Incremental SCC	3
125	DFS Tree	1
126	Rerooting Technique	1
127	Articulation Bridges and Bridge Tree	1
128	Online Articulation Bridges	3
129	Strong Orientation	1
130	Articulation Points.	1
131	Block Cut Tree	2
132	Three Edge Connectivity	3
133	Four Edge Connectivity	3
134	Dynamic K-Connectivity	3
135	Prim's MST	1
136	Krushkal's MST	1
137	Steiner Tree Problem	2
138	Boruvka's Algorithm	2
139	Minimum Diameter Spanning Tree	3
140	Manhattan MST	3
141	Euclidean MST	3
142	Directed MST	3
143	Dynamic MST	3
144	Dijkstra's Algorithm	1
145	Dijkstra on Segment Tree	2
146	Bellman Ford	1
147	Floyd Warshall	1

148	Johnsons Alogrithm	2
149	SPFA	1
150	Cycle Detection	1
151	Minimum Weight Cycle For Each Vertex	2
152	Minimum Weight Cycle For Each Edge	2
153	Dominator tree	2
154	2 SAT	1
155	3 SAT	3
156	Maximum Clique	1
157	Number of Different Cliques	2
158	Maximum Independent Set	1
159	Eulerian Path on a Directed Graph	1
160	Eulerian Path on an Undirected Graph	1
161	Path Union	2
162	Path Intersection	2
163	Virtual Tree	2
164	Welsh-Powell Algorithm	2
165	Chromatic Number	1
166	Chromatic Polynoimial ft Number of DAGs	3
167	Dynamic DAG Reachability	3
168	Minimum Mean Weight Cycle	3
169	Number of 3 and 4 length Cycles	3
170	Counting Labeled Graphs	1
171	Chordal Graph	2
172	Cactus Graph	2
173	Edge Coloring of Simple Graph	3
174	Edge Coloring of Bipartite Graph	3
175	Dynamic Diameter Online	3
176	Tree Orientation to Maximize Pairs of Reachable Nodes	3
177	Number of Arborescences with n Nodes	2
178	Kirchoffs Theorem ft Number of MSTs	2
179	Tuttes Theorem ft Arborescences in a Graph	2
180	BEST Theorem	2
181	System Of Difference Constraints	2
182	Prufer Code	1
183	Number of Ways to Make a Graph Connected	1
184	Tree Isomorphism	1
185	Number of Paths of Each Length in a Tree	2
186	Ear Decomposition	2
187	Eppsteins Algorithm	3
188	Hamiltonian Path Heuristic Algorithm	3
189	Erdos Gallai Theorem	2
190	Havel Hakimi Algorithm	2

191	Dinics Algorithm	1
192	Push Relabel Algorithm	2
193	Min Cost Max Flow	2
194	Min Cost Max Flow with Negative Cycles	3
195	Maximum Closure Problem	2
196	Min Cut in a Planar Graph	2
197	Max Cut in a Planar Graph	3
198	Unique Min Cut	2
199	L-R Flow	2
200	Gomory-Hu Tree	3
201	Gomory Hu Tree of a Planar Graph	3
202	Stoer Wagner Algorithm	3
203	HopCroft Karp Algorithm	1
204	Kuhns Algorithm	1
205	Hungarian Algorithm	1
206	Blossom Algorithm	2
207	Blossom Algorithm Weighted	3
208	Chinese Postman Problem	1
209	ST-numbering	3
210	POSET ft Dilworths and Mirskys Theorem	2
211	Stable Marriage Problem	2
212	Halls Theorem	1
213	Maximum Density Subgraph	3
214	Randomized Matching	2
215	Number of Perfect Matchings in a Graph	3
216	Planarity Check	3

Data Structures

Title	Resources	Difficulty
217	Segment Tree	1
218	Segment Tree with Lazy Propagation	1
219	Persistent Segment Tree	1
220	Persistent Segment Tree with Lazy Propagation	2
221	Dynamic Segment Tree	1
222	2D Dynamic Segment Tree	2
223	Iterative Segment Tree	1
224	Segment Tree ft Arithmetic Progressions	1
225	Segment Tree Merging	2
226	Segment Tree Beats	3
227	Merge Sort Tree	1
228	Wavelet Tree	1

229	Sparse Table	1
230	Disjoint Sparse Table	2
231	Sparse Table 2D	2
232	BIT	1
233	Lower bound on BIT	1
234	BIT with Range Update and Range Query	2
235	2D BIT with Range Update and Range Query	2
236	MOs Algorithm	1
237	MOs on Tree	2
238	MOs with Update	2
239	MOs Online	2
240	MOs with DSU	2
241	Sweepline MO	3
242	Trie	1
243	Persistent Trie	2
244	DSU	1
245	Reachability Tree/ DSU Tree	2
246	DSU with Rollbacks	1
247	Partially Persistent DSU	3
248	Persistent DSU	3
249	Augmented DSU	2
250	Queue Undo Trick	3
251	Dynamic Connectivity Problem	2
252	DSU on Tree	1
253	SQRT Decomposition	1
254	SQRT Decomposition Split and Build Technique	3
255	Centroid Decomposition	1
256	Persistent Centroid Decomposition	3
257	Binarizing a Tree	1
258	HLD ft Subtrees and Path Query	2
259	HLD ft Persistent Lazy Propagation	3
260	LCT	2
261	Treap	2
262	Implicit Treap	2
263	Persistent Treap	3
264	SQRT Tree	3
265	KD Tree	2
266	Cartesian Tree	2
267	Rope	1
268	Monotonous Queue	1
269	BST using STL	1
270	Persistent BST	3
271	Ordered Set	1

272	Static to Dynamic Trick	2
273	Interval Set	2
274	Divide and Conquer on Queries	2
275	Divide and Conquer for Insert and Query Problems	2
276	Venice Technique	1
277	Permutation Tree	3
278	Persistent Array	1
279	Persistent Queue	3
280	Persistent Meldable Heap	2
281	Top Tree	3
282	PQ Tree	3
283	Link Cut Cactus	3
284	HDLT	3

Strings

#	Title	Difficulty
285	KMP	1
286	Prefix Automaton	1
287	Z algorithm	1
288	Aho Corasick	1
289	Dynamic Aho Corasick	2
290	Aho Corasick ft All Pair Occurrence Relation	2
291	String Matching using Bitsets	1
292	String Matching with FFT	2
293	String Hashing	1
294	2D String Hashing	2
295	Suffix Array	2
296	Isomorphic Suffix Array	3
297	Suffix Automaton	2
298	Suffix Automaton ft Distinct Substring Queries in Range.	3
299	Suffix Tree	3
300	Palindromic Tree	2
301	Persistent Palindromic Tree	3
302	Manachers Algorithm	2
303	Minimum Palindrome Factorization	3
304	Number of Palindromes in Range	2
305	Lyndon Factorization	2
306	Main-Lorentz Algorithm	3
307	All Substring Longest Common Subsequence	3
308	Bit LCS	3
309	Cyclic LCS	3

310	De Bruijn Sequence	1
311	LCS on RLE compressed string	3

DP

#	Title	Difficulty
312	Digit DP	1
313	CHT	2
314	Dynamic CHT	2
315	Persistent CHT	3
316	Li Chao Tree	2
317	Persistent Li Chao Tree	2
318	Extended Li Chao tree	3
319	Divide and Conquer Optimization	1
320	Knuth Optimization	1
321	Substring DP	1
322	Bounded Knapsack	1
323	SOS DP	1
324	Subset Sum Convolution	2
325	Dynamic Submask Count	2
326	DP over Divisors	1
327	Subset Sum in SQRT	1
328	LIS Range Query	2
329	Aliens Trick	2
330	1D1D DP Optimization	3
331	Connected Component DP	3
332	Slope Trick	2
333	Subset Union of Bitsets	2
334	Number of Subsequences Having Product at least K	2
335	Hirschbergs Algorithm	3
336	Broken Profile DP/plug dp	2
337	XOR Equation	2
338	"x2 +1 trick"	1
339	Open and Close Interval Trick	1
340	Bitmask DP	1

Geometry

#	Title	Difficulty
341	Geometry 2D Everything	3
342	Basic Point Structure(2D)	1
343	Polar Sort(2D)	1
344	Basic Line Structure(2D)	1
345	Angle Bisector(2D)	1
346	Dist from Point to Line(2D)	1
347	Dist from Point to Ray(2D)	1
348	Dist from Point to Segment(2D)	1
349	Dist from Segment to Segment(2D)	1
350	Check if Point is on Segment(2D)	1
351	Line Line Intersection(2D)	1
352	Point Line Relation(2D)	1
353	Project from Point to Line(2D)	1
354	Project from Point to Segment(2D)	1
355	Ray Ray Distance(2D)	1
356	Ray Ray Intersection(2D)	1
357	Reflection from Point to Line(2D)	1
358	Segment Line Intersection(2D)	1
359	Segment Line Relation(2D)	1
360	Segment Segment Intersection(2D)	1
361	Basic Circle Structure(2D)	1
362	Circle Circle Area(2D)	1
363	Circle Circle Intersection(2D)	1
364	Circle Circle Relation(2D)	1
365	Circle Line Intersection(2D)	1
366	Circle Line Relation(2D)	1
367	Circle Point Relation(2D)	1
368	Tangent Lines from Point(2D)	2
369	Tangent Lines from Circle(2D)	2
370	Maximum Circle Cover(2D)	2
371	Maximum Inscribed Circle(2D)	2
372	Triangle Circle Intersection(2D)	2
373	Polygon Circle Intersection(2D)	2
374	Circle Union(2D)	3
375	Centroid of a Polygon(2D)	1
376	Convex Hull(2D)	1
377	Diameter of a Convex Polygon(2D)	2
378	Extreme Vertex(2D)	2
379	Geometric Median(2D)	2
380	Convexity Check(2D)	1

381	Check if Point is in Convex(2D)	2
382	Check if Point is in Polygon(2D)	2
383	Minimum Enclosing Circle(2D)	2
384	Minimum Enclosing Rectangle(2D)	2
385	Polygon Line Intersection(2D)	2
386	Width of a Polygon(2D)	2
387	Winding Number(2D)	2
388	Dist from Point to Polygon(2D)	2
389	Dist from Polygon to Line(2D)	2
390	Dist from Polygon to Polygon(2D)	2
391	Maximum Dist from Polygon to Polygon(2D)	3
392	Tangents from Point to Polygon(2D)	3
393	Polygon Union(2D)	3
394	Minkwoski Sum(2D)	2
395	Geometry 3D Everything	3
396	Basic Point Structure(3D)	1
397	Basic Line Structure(3D)	1
398	Plane Structure(3D)	1
399	3D Coordinates to 2D	1
400	Distance from Segment to Point(3D)	2
401	Distance from Triangle to Point(3D)	2
402	Distance from Triangle to Segment(3D)	2
403	Distance from Triangle to Triangle(3D)	2
404	Distance from Segment to Segment(3D)	2
405	Plane Plane Intersection	2
406	Basic Sphere Structure	1
407	Sphere Line Intersection	2
408	Segment Segment Intersection on Sphere	2
409	Oriented Angle on Sphere	2
410	Area on The Surface of The Sphere	2
411	Winding Number 3D	3
412	Convex Hull 3D	3
413	Picks Theorem	1
414	Closest Pair of Points	1
415	All Pair Segment Intersection.	3
416	Dynamic Convex Hull	3
417	Delaunay Triangulation	3
418	Voronoi Diagram	3
419	Half Plane Intersection	2
420	Dynamic Half Plane Intersection	3
421	Onion Decomposition	3
422	Point Location	3
423	Convex Hull Intersection using Minkowski	2

424	Generating Points without Collinear Triplets	2
425	Maximum Area of a Triangle from given Lengths	3
426	Vertical decomposition	3

Game theory

#	Title	Difficulty
427	Grundy Number	1
428	Green Hackenbush on Trees and Graphs	2
429	Blue Red HackenBush	3
430	Games on Arbitrary Graphs	2
431	Matching Game On A Graph	2
432	Nimber	3

Miscellaneous

#	Title	Difficulty
433	Bigint	2
434	Two Pointers	1
435	Binary Search	1
436	Fraction Binary Search	3
437	Ternary Search	1
438	Parallel Binary Search	2
439	Josephus Problem	1
440	Permutation with no Arithmetic Progression	1
441	Balanced Brackets	1
442	Knight Moves in Infinity Grid	2
443	Bishop Placement	1
444	Gray Code	1
445	MEX of all Subarrays	3
446	Dates	1
447	Schreier–Sims Algorithm	3
448	Expression Parsing	1
449	Randomized Algorithms	2
450	K-th Root of a Permutation	3
451	Matroid Intersection	3
452	SMAWK Algorithm	3
453	Lindstrom–Gessel–Viennot lemma	3