## **Exotic**

Level Zero			
STL	String		
31L	Vector		
	Pair		
	Stack		
	queue		
	Priority_queue		
	dequeue		
	sort		
	reverse		
	Next_permutation		
	set		
	map		
	iterator		
	iterator		
Number theory	Prime Generation, Sieve and How to Optimize		
Number theory	Bit wise Sieve		
	Modular Arithmetic ( + - *)		
	Modular Inverse (/)		
	Big Mod ( a^b % p)		
	Prime Factorization		
	Number of Divisor		
	Sum of Divisor		
	Sum of Divisor		
Cranh	Graph Bangacantations (Adiacons) Matrix		
Graph	Graph Representations (Adjacency Matrix)		
	Graph Representations (Adjacency List using vector)		
	Breadth First Search BFS		
	Depth First Search DFS		
	Bi coloring		
	Topological Sorting		
	Articulation Point		
	Bridge		
	Strongly Connected Components SCC		
	Dijkstra and variations		
	Bellman Ford and variations		
	Floyd Warshall and variations		
	Kth Shortest Path		
	Minimum Spanning Tree ( Prims)		
	Minimum Spanning Tree ( Kruskal)		
	2-SAT		
DP	Longest Common Sub sequence LCS		
	Coin change		
	Edit Distance		
	Tree DP		
	LIS/LDS in nlogn		
Total Solve Problems	200+ in UVa, Codeforces, LightOJ, Topcoder, SPOJ and USACO		
After Complete	Participate on Codeforces, Topcoder regular contest (Div 2)		

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Level One			
	Extended Euclid		
Number Theory/Math	Euler Phi and inverse phi		
	Factorizing n! Basic combinatorics, Probability and Game theory		
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Cranh	Maximum Flow ( Ford Fulkerson )		
Graph	Maximum Flow ( Poru Pulkerson )  Maximum Flow ( Dinic )		
	Maximum Bipartite Matching and Variations		
	Maximum Independent Set		
	Minimum Cost Maximum Flow		
	Vertex Cover		
	Weighted Bipartite Matching		
	Graph Coloring		
	Stable Marriage Problem		
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Greedy	Task Scheduling		
	Maximum Sum 1D in O(n)		
	Maximum Sum 2D in O(n^3)		
	Maximum Rectangle O(n^2)		
Dynamic Programming	Matrix Chain Multiplication		
	Bitmask DP (Traveling salesman problem)		
	Modular DP(DP with MOD value as a state)		
	Tree Dp		
Data Structure	Trie		
	Union Find		
	BST and variations		
	Неар		
	Binary Indexed Tree and Applications		
	Segment tree		
	Least Common Ancestor		
	Range Minimum Query		
	Splay Tree		
	Treap		
	Centroid Decomposition		
	Dominator Tree		
Total Solve Problems	500+ in UVa, Codeforces, LightOJ, Topcoder, SPOJ and USACO		
After Complete	Participate in Codeforces, Topcoder regular contest (Div 1) it		
	should be Div 1 ;)		

Level two			Ţ	
Game Theory	Nim			
dame meory	Grundy Number and Dp Formulation			
	Alpha Beta Pruning Minimax*			
	Blue Red Hackenbush			
	Minimum Weighted Bipartite Matching/Kuhn-			
	Munacres/Hungarian/Chinese Postman			
	Green Hackenbush			
	Green Hackenbush			
String Algorithms	Suffix Tree, Automata			
Juling Algorithms	KMP Matcher			
	Suffix Array Construction*			
	Longest Common Substring			
	Aho Chorasic Algorithm			
	Manacher's Algo			
	Hashing			
	1.006			
Miscellaneous	Meet In the Middle Approach			
	Konigs Theorem			
	Matrix Tree Theorem*			
	Joseph Problem (Using queue n^2)			
	Joseph Problem (Using recursion n)			
	Managing Biginteger			
	Permutations and Combinations			
	Tower of Hanoi, Variations			
	N Queens Proble			
	Hashing			
	Finding Nth Permutation			
	Huffman Coding			
	Traveling Salesman Problem (Backtracking with pruning)			
	Finding Determinant of a Matrix			
	Finding kth number from a sequence of unsorted numbers in			
	log(n)			
	Transforming Hexagonal grid, Triangular grid to 3d coordinate			
	system			
	Matrix Multiplication			
	Solving Linear Recurrence with Matrix Exponentiation			
	Heavy-Light Decomposition			
Advance DP	All Light OJ Advance DP Problems			
Geometry	Convex Hull			
•	Point inside Convex Polygon ( log(n) )			
	Picks Theorem, Number of Lattice Points inside a polygon			
	Binary Search			
	Ternary Search			
	Segment Segment Intersection			
	Area Of A Concave Polygon			
	Point Inside A Polygon (Convex and Concave)		1	
	Minimum Circle Covering all Points			
	Union of rectangle ( How to cluster, how to make it in nlogn,		1	
	bently)			
	Closest Pair			
Total Solve Problems	800+ in UVa, Codeforces, LightOJ, Topcoder, SPOJ and USACO			
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Level three				

Number Theory/Math	Shanks Algorithm		
Trained Theory, Wath	Dilworth's theorem*		
	BurnsideLemma (http://petr-		
	mitrichev.blogspot.com/2008/11/burnsides-lemma.html)		
	Wilson's Theorem*		
	Lucas Theorem*		
	Gauss Elimination		
	Gauss Ellitillation		
Graph	Minimum Spanning Tree ( For Directed Graphs )		
F	Euler Path (Construction and optimization)		
	Gomory-Hu Tree		
	Edge Cover		
	Largest Clique		
	IDA* Search Problem, 15 Puzzle		
	Group Theory		
	Hamiltonian Cycle		
	Min Weight Cycles in Graph		
	Stoer Wagner ( Finding the minimum cut of a graph )		
	Planar Graph Detection		
	Havel-Hakimi Algorithm (Construct graph given degree of nodes)		
	Maximum Matching(Blossom Shrinking)		
	Max cost-max flow(min cost flow for negative cycle)		
	Wide Cost Max Now(Min Cost Now Tol Megative Cycle)		
Geometry	Convex Hull 3D		
	Line Sweeping/Angle Sweep		
	Fitting a Rectangle inside Another		
	Polygon Intersection		
	Area of a 3d Polygon		
	Polygon Clipping*		
	Rotating Calipers*		
	Triangulation		
	Optimal BST		
	KD tree		
	Link-cut tree		
	Interval Tree		
	Quad tree		
	Complete USACO training system		
Total Solve Problems	1000+ in UVa, Codeforces, LightOJ, Topcoder, SPOJ and USACO		
Extra	Segment Trees, with lazy propagation		
LAUG	Heavy Light Decomposition		
	FFT		
	Tree Decomposition		
	Persistent Segment Tree		
	Palindromic Tree		
	DP Optimizations		
	SOS DP		
	MO's, MO's with update		
	DSU on Tree		