

	Project 100 Syllabus				
Level zero			Level one		
STL			Number Theory/Math		
	string			Extended Euclid	
	vector			Euler Phi and inverse phi	
	pair			Factorizing n!	
	stack			Basic combinatorics, Probability and Game theory	
	queue				
	priority_queue				
	sort		Graph		
	reverse			Maximum Flow ( Ford Fulkerson )	
	next_permutation			Maximum Flow ( Dinic )	
	set			Maximum Bipartite Matching and Variations	
	map			Maximum Independent Set	
	iterator			Minimum Cost Maximum Flow	
Number Theory/Math				Vertex Cover	
	Prime Generation, Sieve and How to Optimize			Weighted Bipartite Matching	
	Bitwise Sieve			Graph Coloring	
	Modular Arithmetic ( + - * )			Stable Marriage Problem	
	Modular Inverse (/)		Greedy		
	Big Mod ( $a^b \% p$ )			Task Scheduling	
	Prime Factorization			Maximum Sum 1D in $O(n)$	
	Number of Divisor			Maximum Sum 2D in $O(n^3)$	
	Sum of Divisor			Maximum Rectangle $O(n^2)$	
Graph			Dynamic Programming		
	Graph Representations (Adjacency Matrix)			Matrix Chain Multiplication	
	Graph Representations (Adjacency List using vector)			Bitmask DP (Traveling salesman problem)	
	Breadth First Search BFS			Modular DP(DP with MOD value as a state)	
	Bicoloring			Tree Dp	
	Depth First Search DFS				
	Topological Sorting		Data Structure		
	Articulation Point			Trie	
	Bridge			Union Find	
	Strongly Connected Components SCC			BST and variations	
	Dijkstra and variations			Heap	
	Bellman Ford and variations			Binary Indexed Tree and Applications	
	Floyd Warshall and variations			Segment tree	
	Kth Shortest Path			Least Common Ancestor	
	Minimum Spanning Tree ( Prims)			Range Minimum Query	
	Minimum Spanning Tree ( Kruskal)			MOs	
Dynamic Programming					
	Longest Common Subsequence LCS		Total Solve Problems	500+ in UVa, Codeforces, LightOJ, Topcoder, SPOJ and USACO	
	Coin change		After Complete	Participate on Codeforces, Topcoder regular contest (Div 1) it should be Div 1 ;)	
	Edit Distance				
	LIS/LDS in $n \log n$				
Total Solve Problems	200+ in UVa, Codeforces, LightOJ, Topcoder, SPOJ and USACO				
After Complete	Participate on Codeforces, Topcoder regular contest (Div 2)				

Level two			Level three		
Game Theory			Number Theory/Math		
	Nim			Shanks Algorithm	
	Grundy Number and Dp Formulation			Dilworth's theorem*	
	Alpha Beta Pruning Minimax*			Burnside Lemma ( <a href="http://petr-mitrichev.blogspot.com/2008/11/burnsides-lemma.html">http://petr-mitrichev.blogspot.com/2008/11/burnsides-lemma.html</a> ))*	
	Hackenbush*			Finding Real roots of an n degree Equation	
	Minimum Weighted Bipartite Matching/Kuhn-Munacres/Hungarian/Chinese Postman			Wilson's Theorem*	
				Lucas Theorem*	
String Algorithms					
	KMP Matcher				
	Suffix Array Construction*		Graph		
	Longest Common Substring			Minimum Spanning Tree ( For Directed Graphs )	
	Aho Choras Algorithm			Euler Path (Construction and optimization)	
	Manacher's Algo			Gomory-Hu Tree	
				Edge Cover	
Miscellaneous				Largest Clique	
	Meet In the Middle Approach			IDA* Search Problem, 15 Puzzle	
	Konigs Theorem			Group Theory	
	Matrix Tree Theorem*			Hamiltonian Cycle	
	Joseph Problem (Using queue $n^2$ )			Min Weight Cycles in Graph	
	Joseph Problem (Using recursion n)			Stoer Wagner ( Finding the minimum cut of a graph )	
	Managing Biginteger			Planar Graph Detection	
	Permutations and Combinations			Havel-Hakimi Algorithm (Construct graph given degree of nodes)	
	Tower of Hanoi, Variations			Maximum Matching(Blossom Shrinking)	
	N Queens Problem			Max cost-max flow(min cost flow for negative cycle)	
	Hashing				
	Finding Nth Permutation		Geometry		
	Huffman Coding			Convex Hull 3D	
	Traveling Salesman Problem (Backtracking with pruning)			Line Sweeping/Angle Sweep	
	Finding Determinant of a Matrix			Fitting a Rectangle inside Another	
	Finding kth number from a sequence of unsorted numbers in log(n)			Polygon Intersection	
	Transforming Hexagonal grid, Triangular grid to 3d coordinate system			Area of a 3d Polygon	
	Matrix Multiplication			Polygon Clipping*	
	Solving Linear Recurrence with Matrix Exponentiation			Rotating Calipers*	
	Heavy-Light Decomposition			Triangulation	
	All Light OJ Advance DP Problems			Optimal BST	
				KD tree	
Advance DP				Link-cut tree	
Geometry				Interval Tree	
	Convex Hull			Quad tree	
	Point inside Convex Polygon ( $\log(n)$ )			Complete USACO training system	
	Picks Theorem, Number of Lattice Points inside a polygon		Total Solve Problems	1000+ in UVa, Codeforces, LightOJ, Topcoder, SPOJ and USACO	
	Binary Search				
	Ternary Search				
	Segment Segment Intersection		Extra	Segment Trees, with lazy propagation	
	Area Of A Concave Polygon			Heavy Light Decomposition	
	Point Inside A Polygon (Convex and Concave)			Splay Tree	
	Minimum Circle Covering all Points			FFT	
	Union of rectangle ( How to cluster, how to make it in nlogn, bently )			Treap	
				Tree Decomposition	
	Closest Pair				

				Persistent Segment Tree	
Total Solve Problems	800+ in UVa, Codeforces, LightOJ, Topcoder, SPOJ and USACO			Palindromic Tree	
				DP Optimizations	