**Basic ----------**

**1: Pattern printing problems 2: Analysis of time complexity 3: Linear Search problems 4: Circular array using simple array 5: Palidrome, Perfect number 6: Simple Hashing problems 7: Prefix Sum Problems 1D/2D 8: Sliding window technique (1/5)**

**Intermediate ----------------**

**1: Binary Search problems (2/5) 2: Find GCD of 2 numbers in LogN (Eunclied and Extended euclined algo) 3: Prime in Sqrt(n) complexity 4: Seive of Eratosthenes 5: Segmented Seive 6: Finding the prime factorization of a number in logn per query 7: Euler Totient function 8: Fermet Little theorem**

**Number Theory ---------------**

**1: Finding x^n in LogN 2: Modular Arithmetic 3: Module Inverse of a number 4: Chines remainder theorem 5: Factorial Modulo Mod 6: Finding nCr & nPr in queries 7: Inclusion Exclusion principle**

**Some Advanced ---------------**

**1: Learn about basic sorting Algorithms (Bubbel, Selectiom, Insertion) 2: Constructive and having swap terms in it 3: Bit Manupulation problems(Left shift,Right shift, Set bit, MSB LSB etc) (Hackerearth as good tuts) 4: Power set of a given array or string using BIT 5: Number of subarray with XOR as ZERO (Not alogirithm, but a nust do problem) 6: Greedy Algoriths Tag 7: Kadan's Algorithms and problem related to them 8: Job sequesnce and activity selection problem**

**Recursion -----------**

**1: Recurssion probelms like finding factorial 2: Implement Binary search using recursion 3: Implement modular exponent 4: Solve recursion problem like finding subset with given sum and other problesm**

**Advanced ---------**

**1: Learn Merge Sort & Quick sort algorithms 2: Do backtracking problems like Sudoku and N-Queen problem (Help in DP path problems) 3: Meet in the middle algo and probs 4: Devide & Conquer problesm on Codeforces 5: Find next greater / Next samller element using stack 6: problesm related to paranthesis 7: Largest ractangular area in Histogram 8: Probleam related to Heap (Priority Queue) Practice Hard on above problesm**

**More Advanced Don't GiveUP (1-4 hr in a problem) -------------------------------------------------**

**1: Hashing on strings, know wh ncollision happens (cpalgorithm site) 2: Rabin karp algo 3: Prefix function 4: KMP Algo 5: Z-Function 6: Manacher's Algo (Solve bunch of problem in above topic)**

**Trees -------------**

**1: Tree / Graph representation 2: DFS/BFS traversel in tree /graph 3: Diameter of a tree/Height/ 4: Euler TOur fo tree 5: Finding LCA using Euler Tour / Binary Lifting 6: DIstance b/w two nodes 7: Subtree Problems (Solve prob on abos tree prob)**

**Graph ------**

**1: Connected Components 2: Topilogical sort 3: Cyclic detection in graph 4: Bipartite check in graph 5: SCC using Kosaraju's alog 6: Dijkarta's Algo 7: Belmenford Algo 8: Floyd warshall algo (Solver more problems on above topic - Hackerearht/Codeforce) 9: Bridge in Grapgh 10: Articulation point in graph 11: Minimum spanning tree & kruskal algo 12: Prim's Alog 13: 0/1 BFS in linear time (cpalgo) 14: Finding bridgesin graph (Solve prob)**

**Dynamic Programming --------------------**

**1: Start with Recusion & Memoization with strong knowledge 2: Knapsack prob solve 3: Solve AtCoder Educational contest on DP 26/26 solve 4: Solve problem from SPOJ then Codeforces 5: Understand how we write recurrence for Digit DP(CF blog) 6: Read DP with bitmasks and solve on hackerearth 7: DP in trees (Rajit jain video) 8: SOS DP 9: Practice More**

**More ------**

**1: Disjoint Set(Using all optimizations) 2: Offline Quesries using Disjoint Set 3: Kruskal's Alog 4: Sparse Table (Not Imp) 5: Fenwick Tree (Read Update Trick also) 6: Binary Lifting on fenwick tree (More Solve prob)**

**And More ---------**

**1: Matrix Exponentiation 2: Sqrt Decomposition 3: Update and query operations 4: Mo's Algo (Codeforce blog) 5: Mo's Algo on Trees 6: Segment Tree (Most Imp topic - Range queries and point updates) 7: Lazy propogation in segment tress This help you tille E- level on Codeforces as least**

**At Last ---------**

**1: Sprague-Grundy Theorem 2: Flows and related prob 3: Heavy light decomposition 4: Convex Hull Alog 5: FFT/NTT**