

DSA CheatSheet

1) Learn a Language--

C++/Java/Python

Resources--

C++ :

R1 = <https://bit.ly/3uzxmbr> (will be completed soon)

R2 = <http://bit.ly/3nOdZZD>

R3 = <http://bit.ly/38FifE6>

Java :

R1 = <http://bit.ly/3heJQA8>

R2 = <http://bit.ly/3mQ7luX>

2) Data Structures--

- ① Arrays
- ② String
- ③ Time & Space Complexity
- ④ Searching (Linear/Binary)
- ⑤ Sorting (Selection/Bubble/Insertion/Merge/Quick/Heap Sort)
- ⑥ Stack
- ⑦ Queue
- ⑧ Linked List (Single/Doubly)
- ⑨ Hashing
- ⑩ Recursion
- ⑪ Backtracking
- ⑫ STL for C++ or Java collections for Java
- ⑬ Tree & Binary Search Tree
- ⑭ Heap/ priority queue
- ⑮ Graph

16 Dynamic programming

Resources--

R1 = <http://bit.ly/3hhe4m1>

3) A) C++ STL--

Topics--

- 1) Vector
- 2) Stack
- 3) Set
- 4) Map
- 5) unordered_set
- 6) unordered_map
- 7) pair
- 8) queue
- 9) deque
- 10) list
- 11) Binary Search/lower_bound/upper_bound
- 11) Custom Comparator

Resources--

R1 = <http://bit.ly/3aICELu>

R2 = <http://bit.ly/3mVoiKc>

R3 = <https://bit.ly/2JpGmOQ>

B) Java Collections--

R1 = <http://bit.ly/3hi1Utd>

4) Algorithms--

1) Number Theory--

- a) Fibonacci Series/Number
- b) Prime
- c) Sieve of Eratosthenes
- d) Segmented Sieve
- e) GCD & Euclid's Algorithm
- f) Fast Modulo Exponentiation

- g) multiplicative modulo inverse
- h) fermat's little theorem

2) Sorting Algorithms--

- a) Selection Sort
- b) Bubble Sort
- c) Insertion Sort
- d) Quick Sort
- e) Merge Sort
- f) Heap Sort

3) Searching--

- a) Linear Search
- b) Binary Search

4) Recursion & Backtracking--

- a) Basic Question
- b) Fibonacci Recursion
- c) Tower of Hanoi
- d) Generate Brackets Recursion
- e) Knapsack Recursion
- f) Phone Keypad Problem
- g) Rat in a maze
- h) N-Queen Problem
- i) Sudoku Problem

5) Greedy

6) Graph Algorithms--

- a) BFS
- b) DFS
- c) Directed Graph
- d) Undirected Graph
- e) Disjoint Set Union

- f) Minimum Spanning Tree (kruskal's Algo, Prim's Algo)
- g) Shortest Path (Dijkstra's Algo, Bellman Ford, Floyd-Warshall)
- h) Cycle Detection
- i) Topological Sort / DAG
- j) Kosaraju's Algo
- k) Connected components / Strongly Connected Comp
- l) Euler Tour
- m) Articulation Point and Bridge
- n) LCA

7) **DP--**

R1 = <http://bit.ly/3rs78XV>

Algorithm Resources--

R1 = <http://bit.ly/3aGKGUV>

R2 = <http://bit.ly/3hgkGkF>

5) Problem Solving Skills--

- 1) LeetCode = <https://leetcode.com/>
- 2) GFG Practice Site = <http://bit.ly/2KEp2WJ>
- 3) A2OJ = <http://bit.ly/38yRgua>
- 4) Hackerrank = <http://bit.ly/3rvG0XQ>