Syllabus of DSA

Topic

- Pattern Printing
- Fundamental of Maths
- Data Types
- Introduction to coding Platforms
- Collection Library
- Hashing
- TRIE
- Fundamental of array
- Sorting
- Number system
- Recursion
- Two-Pointers
- LinkedList
- Dynamic Programming
- .Fundamental of Matrix
- Time & Space Complexity
- .Bit Manipulation
- Stack
- Queue
- Graph
- Heap

Companies

- ✓Amazon
- ✓Facebook
- ✓Bloomberg
- ✓Adobe
- ✓Netapp
- ✓Samsung
- ✓Microsoft
- ✓Apple
- ✓Uber
- ✓Linkedin
- ✓Twitter
- ✓Snapchat
- ✓Google
- ✓Airbnb
- ✓Yahoo
- ✓Jabong
- ✓Zenefits
- ✓Flipkart

Pattern Printing

1. Pattern-1 13
2. Pattern-2 8
3. Pattern-3 3
4. Pattern-4 3
5. Pattern-5 3
6. Pattern-6
7. Pattern-7
8. Pattern-8
9. Print half diamond pattern 1
10. Hollow rectangle pattern
11. Inverted pyramid pattern
12. Rectangle pattern
13. Palindrome pyramid pattern
14. Print pyramid pattern
15. Number Diamond Pattern 1
16. Clock Pattern
17. Down Facing Triangle
18. Binary pattern 3
19. Diamond PNC Pattern
20. Alphabet Pattern 3

Fundamentals of Array

21. Simple Array Sum
22. Min and Max element in the array
23. Mini-Max Sum
24. Search for the missing number
25. Duplicate elements of an array
26. Unique Elements of an array

Fundamental of Matrix

27. Matrix Addition 8
30. Column wise Sum of Matrix
33. Row wise sum of matrix
36. Transpose of a Matrix
37. Check whether matrix is sparse matrix or not
40. Rotation Of a Matrix
43. Anticlockwise-Rotation-of-a-matrix
46. Print Diagonals of a Matrix

Fundamental of Mathematics

47. Sum of a digit
48. Check for a valid triangle
49. Calculate a power b
50. Find factorial for small input range
51. Find the Nth fibonacci number
52. Find number of multiple of 5 and 3
53. Sum of first N Natural Number 1
54. square-sum
55. Find the sum of cubes
56. Check Armstrong number
57. Check-Narcissistic numbers
58. Prime or not 1

Basic Implementation

Introduction to codceforces

Introduction to codechef

Time & Space Complexity

->Asymptotic Notation

Types of error

Number System

->Decimal Number System

->Binary Number System

->Octal Number System

->Hexadecimal Number System

->Conversion from one number system to another

Data types

->Range of a data type

->Signed & Unsigned data type

Importance of constraints

Operators

->Arithmetic Operator

Relational Operator

->Logical Operator

->Bitwise Operator

Bit Manipulation

->Basic of bit manipulation

->Conversion from binary to decimal and vice-versa

59. Binary Representations
60. Check whether the particular bit is set or not
61. Number of 1 Bits

Asked In :- Microsoft, Apple

62. Power of Two

Asked In :- Google

63. Set X and Y bit
64. A power to N
67. Count the set bits
70. Toggle the Kth Bit
73. Set The Kth Bit
76. subsets 4
79. ithBitSetOrNot
82. Clear The Kth Bit
83. Reverse Bits

Asked In :- Apple, Airbnb

84. Subsets

Asked In :- Facebook, Amazon, Bloomberg, Uber

85. Single Number

Asked In :- Airbnb

86. Single Number II
87. Single Number III

->Miscellaneous Question

Recursion

Basic concept

88. ->Sum ,Fact ,Fib ,AP Sum .
    Mathematical analysis of time complexity.
    Master theorem
89. Tower of Brahma

90. balanced-parentheses
91. . combination-sum-1

92. Forming a Magic Square

93. Miscellaneous String Problem

Sorting

94. Selection Sort Implementation
95. Bubble Sort implementation
96. Insertion sort implementation
97. Running Time of Algorithms
98. Counting Sort 1
99. Counting Sort 2
100. Closest Numbers
101. Find the Median
102. Insertion Sort Advanced Analysis
103. ->Merge sort/ Quick sort
104. Merge Sorted Array
    Asked In :-Facebook, Microsoft, Bloomberg
105. Sort Zero's And One's

2 Pointers Technique

->Concept

106. ->Palindrome

107. Two Sum

Asked In :- Yahoo, Airbnb, Yelp

108. Diffk

Asked In :- Facebook

109. >Triplet sum

Asked In:-Facebook, Microsoft, Adobe, Bloomberg, Amazon

Linear & Binary Search

->Concept

->Recursive code for Linear & Binary Search

110. Search an Element

111. Square Root 10

Asked In:-Facebook, Bloomberg, Apple

112. Cube Root 1

113. Finding The Floor 1

114. Find First and Last Position of Element in Sorted Array

Asked In :- LinkedIn

115. Aggressive cows

116. 90. Job Scheduling

117. 91. Median Of a Array

Hashing

118. Why hashing?
119. Hashing Techniques
120. Collision Resolutions
121. Sparse Arrays
122. Contains Duplicate

Asked In :- Yahoo, Airbnb

123. Contains Duplicate II

Asked In :- Airbnb

124. Valid Anagram

Asked In :-Amazon, Uber

125. Pair Sum
126. Maximum Sub Array Sum
127. Non decreasing subsequence
128. Longest Length whose element can be rearranged in a contiguous order(Array Contains Unique And Duplicate Element).
129. Unique Element Present in the Window of Size K.
130. Strings
131. Frequency of all the alphabet in a given String
132. Largest Palindromic Substring
133. String A contains String B character by character
134. String A contains String B
135. Rabin-Karp Algorithm

Math

136. ->No of primes
137. Count Primes
Asked In :- Amazon, Microsoft
138. Factorial Trailing Zeroes
Asked In :-Bloomberg, Microsoft, Jabong
139. ->Factors
140. ->AP & GP
141. ->LCM & HCF
142. Greatest Common Divisor
Asked In :-Netapp, Google
143. Meet in the Middle(Cabinet Partition)
Game Theory
144. ->N-Piles Games
145. ->NIM's Game
146. Prefix Product & Suffix Product
147. Product of all the element except the element at particular Index.
148. Search in Rotated Sorted Array
Asked In :- Uber, LinkedIn, Microsoft
149. Length of Longest Sub Array Contains equal no of Zero And One's
150. Miscellaneous Problem
151. Matrix related problem
152. Spiral Matrix
Asked In :- Google, Microsoft, Uber
153. Search a 2D Matrix II
Asked In :- Google, Amazon
154. Search a 2D Matrix

Asked In :- Google

155. Binary Matrix 2
156. First Missing Positive Number
157. Trapping Rain Water

Asked In :-Twitter, Bloomberg, Amazon

158. Miscellaneous Questions

Stack & Queue

159. ->Theory
160. ->Insert/Search/Delete
161. ->Get Average At Any Instance
162. Implement 2 stacks in a array
163. Implement M stacks in a Array
164. Implement Queue Using stack
165. Amortized Analysis
166. Maximum Element
167. Balanced Brackets
168. Equal Stacks
169. Largest Rectangle
170. Max stack
171. Min Stack

Asked In :- Google, Snapchat, Amazon, Zenefits

Array

Internals of Dynamic List

->get(int i)

->add(int i)

->add(int index,E element)

->clear();

->remove(int i)

->remove(Object obj)

->size()

->indexOf(Object obj)

->lastIndexOf(Object obj)

->isEmpty()

->sort()

->set(int index, E element)

With there respective time complexity and space complexity.

172. Populate Another Array Smaller Elements On Right Side

173. For every Window Find the Maximum Element

LinkedList

->Basic Concept

->Insert(Head/Tail/Middle)

->Delete(Head/Tail/Middle)

174. Print the Elements of a Linked List
175. Insert a node at the head of a linked list
176. Insert a Node at the Tail of a Linked List
177. Insert a node at a specific position in a linked list
178. Remove Duplicates from Sorted List II
179. Get Node Value
180. Delete a Node
181. Find Merge Point of Two Lists
182. Compare two linked lists
183. Merge two sorted linked lists

Asked In :-Amazon, LinkedIn, Apple

184. Cycle Detection

Asked In :- Microsoft, Amazon, Yahoo

185. Delete duplicate-value nodes from a sorted linked list
186. Inserting a Node Into a Sorted Doubly Linked List
187. Palindromic Linked List 1
188. ->Create deleteAll function
189. ->Create FindDistinct function
190. Create Unique function
191. ->Sort LinkedList
192. ->Separate Positive & Negative Number From LinkedList
193. Reverse Linked List

Asked In :- Amazon, Microsoft, Uber, Snapchat

194. LFU

Trees

->Basic concepts

195. PreOrder Traversal
196. InOrder Traversal 1

Asked In :-Microsoft

197. PostOrder Traversal
198. Height of Tree 1
199. Left View of Tree 1
200. Find Depth

201. Sum OF all the Elements Present in a Tree
202. Max Element Present in a Tree
203. Mirror Image

204. Tree : Top View

205. Tree: Level Order Traversal

Asked In :- Facebook, Amazon, Apple

206. Binary Search Tree : Insertion

207. Binary Search Tree : Lowest Common Ancestor

208. 167. Insert/Search/Delete
209. 168. IsBST
210. Vertical Order Traversal of a Binary Tree

Asked In :- Samsung

211. ->Diameter of a tree
212. Diameter of Binary Tree

Asked In :- Google, Facebook.

213. Minimum Distance Between BST Nodes

Asked In :- Google

214. Binary Tree Paths

Asked In :- Google, Facebook

215. Find the Maximum Sum Path
216. Least Common Ancestor
217. Nodes at K distance
218. Right-View Of A Tree
219. Ceil Of Given Element
220. Trim the BST such that it contains data in the given range
221. Given Pre-Order And In-Order Find Post-Order
222. Convert a given binary tree into doubly linked list

Heap

223. Print the sorted Matrix Which is only row-wise sorted
224. . Miscellaneous questions

TRIE

225. Matrix Problems
226. Given an array find the max sub array XOR
227. Median of a Sub Array

Dynamic Programming

228. Fundamental OF DP
229. Ladder-Problem
230. Number of Dice Rolls for a given sum
233. Arranging Dominos 1
236. Binary Strings with no adjacent 1's

237. Filling a floor
238. 6 sided dice, to get a sum K(in minimum turn)
239. Painting House
240. Max subsequence sum such that chosen element must not be adjacent
241. Miscellaneous Problem
242. Knapsack
243. Coin Change Problem
244. Matrix Problem

Graphs

Basic Concept

245. ->BFS
246. ->DFS
247. Path in a Graph-1
250. Longest path in a graph
251. Number of Connected Components In a Graph
254. Number of islands in a graph
257. Is a forest
258. Given a graph, check whether its tree or not
259. Shortest Path from source to destination
260. (Dijkstra Algorithm)
261. Krushkal's algorithm
262. Topological Sort
263. Bi-Partite Graph
264. Segment tree
265. SQRT Decomposition

Add on

266. Grading Students

267. Apple and Orange

268. Number Line Jumps

269. Between Two Sets

270. Breaking the Records

271. Subarray Division

272. Divisible Sum Pairs

273. Migratory Birds

274. Bill Division

275. Sales by Match

276. Drawing Book

277. Counting Valleys

278. Electronics Shop

279. Cats and a Mouse

280. Forming a Magic Square

281. Picking Numbers

282. Climbing the Leaderboard

283. The Hurdle Race

284. Utopian Tree

285. Angry Professor

286. Beautiful Days at the Movies

287. Viral Advertising

288. Save the Prisoner!

289. Circular Array Rotation

290. Sequence Equation

291. Jumping on the Clouds: Revisited

292. Find Digits

293. Extra Long Factorials

294. Append and Delete

295. Sherlock and Squares

296. Library Fine

297. Cut the sticks

298. Non-Divisible Subset

299. Repeated String

300. Jumping on the Clouds

301. Equalize the Array

302. Queen's Attack II

303. ACM ICPC Team

304. Taum and B'day

305. Modified Kaprekar Numbers

306. Beautiful Triplets

307. Minimum Distances

308. Halloween Sale

309. The Time in Words

310. Chocolate Feast

311. Service Lane

312. Flatland Space Stations

313. Fair Rations

314. Cavity Map

315. Strange Counter