heycoach

SUPER 30 - DSA AND SYSTEM DESIGN - MAANG PREPARATION

LEGEND

Color	Category
Blue	DATA STRUCTURES AND ALGORITHMS
Orange	INTERVIEW PREPARATION
Purple	LOW LEVEL DESIGN
Dark Green	HIGH LEVEL SYSTEM DESIGN
Teal	EVALUATIONS
Light Green	DISCUSSIONS

Week 1 — Building blocks and basic algorithms

Module	Details
Time complexity	Standard notations; Substitution method, recursion tree; Master theorem
Sorting - 1	Bubble, Selection, Insertion; Problem Solving
Sorting - 2	Divide and Conquer approach; Merge, Quick sort; Complexity analysis for all of them
MAANG interviews	How to Leetcode; MAANG interview processes; Bar raiser/special rounds
Coding test	Eligibility test
Leveling test	Test from the leveling framework personalized to your level from The Great Pyramid

Week 2 — Basic data structures

Module	Details
Searching	Binary, Ternary search; Complexity analysis; Modified Binary Search
Arrays	Theory and important functions; Different types of questions; Problem solving
Strings	Theory, Question patterns in Strings; Problem solving
Arrays and strings	Problem solving
Coding test	Weekend test on topics covered so far
Leveling test	Test from the leveling framework personalized to your level

Week 3 — Basic data structures

Module	Details
Sets	Theory and basic functions; Problem solving
Hashmaps	Theory and basic functions; When to use hashmaps; Problem solving
Problem solving	Miscellaneous sorting algorithms like Radix sort, Bucket sort, Counting sort overview.
Queues	Theory and basic functions; When to use queues; Problem solving
Coding test	Weekend test on topics covered so far
Leveling test	Test from the leveling framework personalized to your level

Week 4 — Basic Data Structures and Dynamic Programming / Profile presentation

Module	Details
Stacks - 1	Theory and basic functions; When to use stacks; Problem solving
Stacks - 2	Problem solving
Dynamic programming - 1	Identification of sub-problems; Memoization and Dynamic programming
Dynamic programming - 2	Implementation of memoization; Time complexity; Problem solving
Coding test	Weekend test on topics covered so far
Profile presentation and interview prep	Emails, resume review, cover letter; LinkedIn, GitHub, personal website; Tracker sheet setup, Interview anxiety and confidence

Week 5 — Dynamic programming

Module	Details
Dynamic programming - 3	Implementation of DP; Transition from memoization to DP; Time complexity and problem solving
Dynamic programming - 4	Problem solving
Dynamic programming - 5	Problem solving
Dynamic programming - 6	Buffer session on DP
Coding test	Weekend test on topics covered so far
Leveling test	Test from the leveling framework personalized to your level

Week 6 — Advanced data structures / Hiring manager round

Module	Details
Linked lists - 1	Theory and basic functions; Problem solving
Linked lists - 2	Problem solving
Fireside chat	Fireside chat with a MAANG recruiter
Hiring manager round	Leadership principles; Scenario questions. Bar raiser round; Getting better at soft skills; Interview closure questions
Coding test	Weekend test on topics covered so far
Leveling test	Test from the leveling framework personalized to your level

Week 7 — Advanced data structures

Module	Details
Binary trees	Trees, Binary trees; Problem solving
Binary search trees - 1	Implementation of trees and binary search trees; When to use BSTs
Binary search trees - 2	Problem solving
Tries	Theory and basic functions; When to use tries; Problem solving
Coding test	Weekend test on topics covered so far
Leveling test	Test from the leveling framework personalized to your level

Week 8 — Advanced data structures

Module	Details
Heaps - 1	Theory and basic functions; Heap sort, min heap, max heap, heapify
Heaps - 2	Problem solving
Heaps - 3	Problem solving
Job Hunt	Recruitment platforms; Approaching recruiters; Start working on personal project, open source contribution
Coding test	Weekend test on topics covered so far
Leveling test	Test from the leveling framework personalized to your level

Week 9 — Graph algorithms

Module	Details
BFS and DFS - 1	Directed, undirected, weighted graphs. How to input the input. BFS, DFS. Shortest path algorithms
BFS and DFS - 2	Problem solving
Minimum spanning trees	Minimum spanning tree; Kruskal, Prims; Implementation of MST
Greedy	Greedy; Implementation of greedy
Coding test	Weekend test on topics covered so far
Leveling test	Test from the leveling framework personalized to your level

Week 10 — Advanced data structures

Module	Details
Graphs - 1	Problem solving
Graphs - 2	Problem solving
Backtracking and recursion	Concept; Problem solving
Patterns	Types of questions; Common patterns to identify the data structures from MindMap
Coding test	Weekend test on topics covered so far
Leveling test	Test from the leveling framework personalized to your level

Week 11 — Low Level Design

Module	Details
Object oriented programming	Git and GitHub; Code structure. OOPS concepts; Theory and Implementation
Introduction to design patterns	Why need design patterns; 3 most useful design patterns with implementation; Real life use cases
Low level design	Identify entities, design ER diagram; Choose the right data structure; Library management system; Implementation details
Advanced low level design	Building advanced systems; Identifying and implementing the right design patterns
Hands-on	Game development (required for companies like Flipkart, Swiggy, Udaan, Razorpay)
Leveling test	Test from the leveling framework personalized to your level

Week 12 — High level design concepts

Module	Details
Networking concepts	TCP IP, UDP protocols; Client server network, P2P network; DNS resolution
Database concepts	Data partitioning; Indexing and database locks; Master slave architecture; CAP Theorem. SQL vs NoSQL
Memory management concepts	Paging and segmentation; Cache eviction strategies; Distributed file systems
OS concepts on concurrency	Multithreading and concurrency; Scheduling algorithms; Semaphores and deadlocks; Atomic transactions
Demo MAANG interview	A demo of how real interviews are conducted in MAANG companies. Level of questions and expectations.
Leveling test	Test from the leveling framework personalized to your level

Week 13 — High level system design interviews

Module	Details
System design concepts	Communication and data exchange; REST APIs and AJAX; Long polling, websockets and SSEs; Load balancers, Caching
Approach	Requirements; Estimations and components; Identifying challenges with each component
Deep dive	Single point of failures; Systems at scale
Question	Designing a system like BookMyShow
System Design Test	Test on System design concepts
Leveling test	Test from the leveling framework personalized to your level

Week 14 — MAANG system design interviews

Module	Details
Question	Designing Google Maps
Question	Designing Uber at scale
Open session	Any topic that needs to be revisited in system design
Fireside chat	Fireside chat with a MAANG engineering manager
System Design Test	Test on System design concepts
Leveling test	Test from the leveling framework personalized to your level

Week 15 — Advanced concepts for eligible learners

Module	Details
Union Find Topological sort	Union Find, Topological sort; Problem solving, solving BFS / DFS question with union find.
Math for competitive programming	Combinatorics; Primality test
Self balancing trees	Red Black Tree; AVL Tree; Problem solving
Bit manipulation	Concept and applications; Problem solving
Coding test series	Placement test - 4
Coding test series	Placement test - 5

Week 16 — MAANG system design interviews

Module	Details
Mock interview	LLD mock interview individually scheduled
Mock interview	HLD mock interview individually scheduled
Open session	Quick revision on patterns in CP questions
Coding test series	Placement test - 1
Coding test series	Placement test - 2
Coding test series	Placement test - 3