

MACHINE MODE: 100-DAY COMPLETE PLAN (DAYS 1-33)

WEEK 1: FOUNDATIONS (JULY 7-13)

MACHINE MODE: DAY 1 – JULY 7

DSA: Arrays (Easy Level Warm-Up)

- LC 1920: Build Array from Permutation
- LC 1480: Running Sum of 1d Array
- LC 1295: Find Numbers with Even Number of Digits
- LC 1365: How Many Numbers Are Smaller Than the Current Number
- LC 88: Merge Sorted Array  Goal: Focus on problem patterns, not just solutions. Write notes for each.

SYSTEM DESIGN: DNS & Domain Resolution

- Watch: "DNS Explained - How Domain Name System Works" - PowerCert Animated Videos
 - Task: Draw DNS Resolution Flow → Client → Resolver → Root → TLD → Authoritative
 - Bonus: Write a 100-word explanation of DNS as if you're explaining it to a child
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MACHINE MODE: DAY 2 – JULY 8

DSA: Arrays (Two Pointers Introduction)

- LC 283: Move Zeros
- LC 167: Two Sum II - Input Array Is Sorted
- LC 344: Reverse String
- LC 27: Remove Element
- LC 26: Remove Duplicates from Sorted Array  Goal: Practice pointer movement. Visualize pointer positions.

SYSTEM DESIGN: Load Balancing

- Watch: "Load Balancers Explained" - Gaurav Sen
 - Task: Diagram Client → Load Balancer → App Servers (Round Robin, Least Connections)
 - Bonus: Compare Layer 4 vs Layer 7 load balancing in 3 sentences
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★ MACHINE MODE: DAY 3 – JULY 9

🎯 DSA: Two Pointers (Medium)

- LC 15: 3Sum
- LC 11: Container With Most Water
- LC 125: Valid Palindrome
- LC 977: Squares of a Sorted Array
- LC 42: Trapping Rain Water ↗ Goal: Master the expand-around-center and sliding window concepts.

💬 SYSTEM DESIGN: CAP Theorem

- Watch: "CAP Theorem Simplified" - Gaurav Sen
 - Task: Draw 3 scenarios showing Consistency, Availability, Partition Tolerance trade-offs
 - Bonus: Give real-world examples of CP, AP, and CA systems
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★ MACHINE MODE: DAY 4 – JULY 10

🎯 DSA: Prefix Sums

- LC 303: Range Sum Query - Immutable
- LC 304: Range Sum Query 2D - Immutable
- LC 560: Subarray Sum Equals K
- LC 724: Find Pivot Index
- LC 1732: Find the Highest Altitude ↗ Goal: Understand cumulative sum optimization for range queries.

💬 SYSTEM DESIGN: Caching Strategies

- Watch: "Caching Explained" - ByteByteGo
 - Task: Draw cache hierarchy (Browser → CDN → Server → Database)
 - Bonus: Explain cache-aside, write-through, write-behind patterns
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★ MACHINE MODE: DAY 5 – JULY 11

🎯 DSA: Array Manipulation

- LC 1: Two Sum
- LC 238: Product of Array Except Self

- LC 53: Maximum Subarray
- LC 121: Best Time to Buy and Sell Stock
- LC 217: Contains Duplicate  Goal: Master array traversal patterns and space-time trade-offs.

SYSTEM DESIGN: RDBMS vs NoSQL

- Watch: "SQL vs NoSQL Database Explained" - Fireship
 - Task: Create comparison table with use cases, ACID properties, scaling
 - Bonus: Design simple schema for both SQL and NoSQL for a blog system
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MACHINE MODE: DAY 6 – JULY 12

DSA: Week 1 Review

- LC 169: Majority Element
- LC 122: Best Time to Buy and Sell Stock II
- LC 136: Single Number
- LC 268: Missing Number
- LC 448: Find All Numbers Disappeared in an Array  Goal: Speed solving - complete all 5 problems in 90 minutes.

SYSTEM DESIGN: HTTP/HTTPS & REST APIs

- Watch: "HTTP vs HTTPS Explained" - PowerCert Animated Videos
 - Task: Design RESTful API endpoints for a simple e-commerce system
 - Bonus: Explain status codes 200, 201, 400, 401, 404, 500
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MACHINE MODE: DAY 7 – JULY 13

DSA: Mixed Practice

- LC 485: Max Consecutive Ones
- LC 66: Plus One
- LC 35: Search Insert Position
- LC 58: Length of Last Word
- LC 13: Roman to Integer  Goal: Pattern recognition across different problem types.

SYSTEM DESIGN: Week 1 Consolidation

- Task: Draw complete architecture combining all Week 1 concepts
 - Scenario: Design basic web application with DNS, load balancing, caching, database
 - Bonus: Create 5-minute presentation explaining your design
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WEEK 2: SLIDING WINDOWS & HASH MAPS (JULY 14-20)

🌟 MACHINE MODE: DAY 8 – JULY 14

🎯 DSA: Hash Maps Basics

- LC 242: Valid Anagram
- LC 349: Intersection of Two Arrays
- LC 202: Happy Number
- LC 205: Isomorphic Strings
- LC 290: Word Pattern  Goal: Master hash map operations and frequency counting.

💬 SYSTEM DESIGN: Message Queues

- Watch: "Message Queues Explained" - Hussein Nasser
 - Task: Draw producer → Queue → Consumer architecture
 - Bonus: Compare RabbitMQ vs Apache Kafka use cases
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🌟 MACHINE MODE: DAY 9 – JULY 15

🎯 DSA: Sliding Window (Fixed Size)

- LC 643: Maximum Average Subarray I
- LC 1456: Maximum Number of Vowels in a Substring
- LC 1343: Number of Sub-arrays of Size K
- LC 1652: Defuse the Bomb
- LC 2269: Find the K-Beauty of a Number  Goal: Master fixed-size sliding window technique.

💬 SYSTEM DESIGN: File Upload Architecture

- Watch: "File Upload System Design" - Concept && Coding
 - Task: Design file upload flow with validation, storage, and CDN
 - Bonus: Handle large file uploads with chunking and resume capability
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🌟 MACHINE MODE: DAY 10 – JULY 16

🎯 DSA: Sliding Window (Variable Size)

- LC 3: Longest Substring Without Repeating Characters
- LC 76: Minimum Window Substring
- LC 209: Minimum Size Subarray Sum
- LC 424: Longest Repeating Character Replacement
- LC 1004: Max Consecutive Ones III 💡 Goal: Master expand-contract sliding window pattern.

💬 SYSTEM DESIGN: Pub/Sub Systems

- Watch: "Publish Subscribe Pattern" - Defog Tech
 - Task: Design notification system using pub/sub pattern
 - Bonus: Compare push vs pull models for subscribers
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🌟 MACHINE MODE: DAY 11 – JULY 17

🎯 DSA: Hash Maps Advanced

- LC 49: Group Anagrams
- LC 128: Longest Consecutive Sequence
- LC 36: Valid Sudoku
- LC 347: Top K Frequent Elements
- LC 380: Insert Delete GetRandom O(1) 💡 Goal: Combine hash maps with other data structures.

💬 SYSTEM DESIGN: Event-Driven Architecture

- Watch: "Event Driven Architecture" - ByteByteGo
 - Task: Design e-commerce order processing using events
 - Bonus: Explain event sourcing and CQRS patterns
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🌟 MACHINE MODE: DAY 12 – JULY 18

🎯 DSA: Sliding Window Advanced

- LC 438: Find All Anagrams in a String
- LC 567: Permutation in String
- LC 30: Substring with Concatenation of All Words

- LC 187: Repeated DNA Sequences
- LC 1248: Count Number of Nice Subarrays  Goal: Master string pattern matching with sliding window.

SYSTEM DESIGN: Microservices Architecture

- Watch: "Microservices Explained" - TechWorld with Nana
 - Task: Break down monolithic e-commerce into microservices
 - Bonus: Design inter-service communication patterns
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MACHINE MODE: DAY 13 – JULY 19

DSA: Week 2 Speed Round

- LC 713: Subarray Product Less Than K
- LC 383: Ransom Note
- LC 904: Fruit Into Baskets
- LC 219: Contains Duplicate II
- LC 159: Longest Substring with At Most Two Distinct Characters
- LC 395: Longest Substring with At Least K Repeating Characters  Goal: Speed and accuracy - complete all 6 problems in 90 minutes.

SYSTEM DESIGN: Distributed Systems Concepts

- Watch: "Distributed Systems Explained" - Martin Kleppmann
 - Task: Design distributed cache system with consistency guarantees
 - Bonus: Explain Byzantine fault tolerance
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MACHINE MODE: DAY 14 – JULY 20

DSA: Mixed Review

- LC 442: Find All Duplicates in an Array
- LC 1207: Unique Number of Occurrences
- LC 1695: Maximum Erasure Value
- LC 594: Longest Harmonious Subsequence
- LC 1346: Check If N and Its Double Exist  Goal: Apply Week 1-2 concepts to solve varied problems.

💬 SYSTEM DESIGN: Week 2 Integration

- Task: Design complete messaging application backend
 - Include: File uploads, message queues, pub/sub, microservices
 - Bonus: Add real-time features with WebSockets
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WEEK 3: STACKS, LINKED LISTS & RATE LIMITING (JULY 21-27)

🌟 MACHINE MODE: DAY 15 – JULY 21

🎯 DSA: Stack Basics

- LC 20: Valid Parentheses
- LC 155: Min Stack
- LC 232: Implement Queue using Stacks
- LC 225: Implement Stack using Queues
- LC 682: Baseball Game 💎 Goal: Master stack operations and LIFO principle.

💬 SYSTEM DESIGN: Rate Limiting Algorithms

- Watch: "Rate Limiting Algorithms" - Hussein Nasser
 - Task: Implement Token Bucket and Leaky Bucket algorithms on paper
 - Bonus: Design rate limiter for API gateway
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🌟 MACHINE MODE: DAY 16 – JULY 22

🎯 DSA: Stack Applications

- LC 739: Daily Temperatures
- LC 496: Next Greater Element I
- LC 503: Next Greater Element II
- LC 84: Largest Rectangle in Histogram
- LC 85: Maximal Rectangle 💎 Goal: Use stack for monotonic problems and optimization.

💬 SYSTEM DESIGN: Simple LRU Cache

- Watch: "LRU Cache Implementation" - Back To Back SWE
- Task: Design and implement LRU cache with get/put operations
- Bonus: Optimize for O(1) time complexity using hash map + doubly linked list

★ MACHINE MODE: DAY 17 – JULY 23

⌚ DSA: Linked Lists Basics

- LC 206: Reverse Linked List
- LC 21: Merge Two Sorted Lists
- LC 141: Linked List Cycle
- LC 142: Linked List Cycle II
- LC 160: Intersection of Two Linked Lists ↗ Goal: Master pointer manipulation and cycle detection.

💬 SYSTEM DESIGN: Sliding Window Rate Limiting

- Watch: "Rate Limiting Techniques" - Concept && Coding
 - Task: Design sliding window log and fixed window counter
 - Bonus: Compare space-time trade-offs of different rate limiting approaches
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★ MACHINE MODE: DAY 18 – JULY 24

⌚ DSA: Linked Lists Advanced

- LC 2: Add Two Numbers
- LC 19: Remove Nth Node From End of List
- LC 24: Swap Nodes in Pairs
- LC 148: Sort List
- LC 234: Palindrome Linked List ↗ Goal: Master linked list manipulation and recursive approaches.

💬 SYSTEM DESIGN: Distributed Rate Limiting

- Watch: "Distributed Rate Limiting" - System Design Interview
 - Task: Design rate limiter across multiple servers using Redis
 - Bonus: Handle race conditions and atomic operations
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★ MACHINE MODE: DAY 19 – JULY 25

⌚ DSA: Queue Applications

- LC 346: Moving Average from Data Stream
- LC 933: Number of Recent Calls

- LC 622: Design Circular Queue
- LC 641: Design Circular Deque
- LC 1700: Number of Students Unable to Eat Lunch  Goal: Implement queue variations and understand FIFO principle.

SYSTEM DESIGN: Circuit Breaker Pattern

- Watch: "Circuit Breaker Pattern" - Defog Tech
 - Task: Design circuit breaker for service-to-service communication
 - Bonus: Implement half-open state and failure threshold logic
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MACHINE MODE: DAY 20 – JULY 26

DSA: Stack & Queue Combined

- LC 150: Evaluate Reverse Polish Notation
- LC 71: Simplify Path
- LC 394: Decode String
- LC 1249: Minimum Remove to Make Valid Parentheses
- LC 1047: Remove All Adjacent Duplicates In String  Goal: Solve complex problems using stack/queue combinations.

SYSTEM DESIGN: Bulkhead Pattern

- Watch: "Bulkhead Pattern Explained" - Architecture Patterns
 - Task: Design system with isolated resource pools
 - Bonus: Apply bulkhead pattern to thread pools and database connections
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MACHINE MODE: DAY 21 – JULY 27

DSA: Week 3 Assessment

- LC 856: Score of Parentheses
- LC 92: Reverse Linked List II
- LC 239: Sliding Window Maximum
- LC 1190: Reverse Substrings Between Each Pair of Parentheses
- LC 25: Reverse Nodes in k-Group  Goal: Complete all 5 problems in 2 hours - demonstrate mastery under pressure.

SYSTEM DESIGN: Week 3 Capstone

- Task: Design complete rate-limited API system
 - Include: Multiple rate limiting strategies, circuit breakers, monitoring
 - Bonus: Add adaptive rate limiting based on system load
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WEEK 4: BINARY SEARCH & RECURSION (JULY 28 - AUG 3)

MACHINE MODE: DAY 22 – JULY 28

DSA: Binary Search Basics

- LC 704: Binary Search
- LC 35: Search Insert Position
- LC 278: First Bad Version
- LC 374: Guess Number Higher or Lower
- LC 69: Sqrt(x)  Goal: Master binary search template and boundary conditions.

SYSTEM DESIGN: URL Shortener - Core Logic

- Watch: "URL Shortener System Design" - Gaurav Sen
 - Task: Design encoding/decoding algorithms (Base62, MD5, Counter)
 - Bonus: Handle custom URLs and collision resolution
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MACHINE MODE: DAY 23 – JULY 29

DSA: Binary Search on Arrays

- LC 34: Find First and Last Position of Element
- LC 33: Search in Rotated Sorted Array
- LC 153: Find Minimum in Rotated Sorted Array
- LC 162: Find Peak Element
- LC 74: Search a 2D Matrix  Goal: Apply binary search to modified sorted arrays.

SYSTEM DESIGN: URL Shortener - Database Design

- Watch: "Database Design for URL Shortener" - Concept && Coding
- Task: Design database schema with indexes and partitioning
- Bonus: Calculate storage requirements and choose appropriate database

🌟 MACHINE MODE: DAY 24 – JULY 30

🎯 DSA: Binary Search on Answers

- LC 875: Koko Eating Bananas
- LC 1011: Capacity To Ship Packages Within D Days
- LC 410: Split Array Largest Sum
- LC 1482: Minimum Number of Days to Make m Bouquets
- LC 1283: Find the Smallest Divisor Given a Threshold 💡 Goal: Master binary search on solution space.

💬 SYSTEM DESIGN: URL Shortener - Caching & Performance

- Watch: "Caching Strategies for URL Shortener" - System Design Interview
- Task: Design multi-layer caching (Redis, CDN, Application cache)
- Bonus: Implement cache warming and expiration policies

🌟 MACHINE MODE: DAY 25 – JULY 31

🎯 DSA: Recursion Basics

- LC 344: Reverse String
- LC 509: Fibonacci Number
- LC 70: Climbing Stairs
- LC 118: Pascal's Triangle
- LC 119: Pascal's Triangle II 💡 Goal: Understand recursion principles and base cases.

💬 SYSTEM DESIGN: URL Shortener - Scaling

- Watch: "Scaling URL Shortener" - Success in Tech
- Task: Design distributed system with load balancing and auto-scaling
- Bonus: Handle hot keys and implement rate limiting

🌟 MACHINE MODE: DAY 26 – AUGUST 1

🎯 DSA: Backtracking Introduction

- LC 46: Permutations

- LC 78: Subsets
- LC 77: Combinations
- LC 39: Combination Sum
- LC 40: Combination Sum II  Goal: Master backtracking template and pruning techniques.

SYSTEM DESIGN: URL Shortener - Analytics

- Watch: "Analytics System Design" - ByteByteGo
 - Task: Design click tracking and analytics dashboard
 - Bonus: Implement real-time analytics with time-series database
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MACHINE MODE: DAY 27 – AUGUST 2

DSA: Backtracking Advanced

- LC 17: Letter Combinations of a Phone Number
- LC 22: Generate Parentheses
- LC 79: Word Search
- LC 131: Palindrome Partitioning
- LC 93: Restore IP Addresses  Goal: Apply backtracking to string and grid problems.

SYSTEM DESIGN: URL Shortener - Security

- Watch: "Security in System Design" - Gaurav Sen
 - Task: Implement authentication, authorization, and abuse prevention
 - Bonus: Add URL validation and malware detection
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MACHINE MODE: DAY 28 – AUGUST 3

DSA: Week 4 Challenge

- LC 540: Single Element in a Sorted Array
- LC 658: Find K Closest Elements
- LC 51: N-Queens
- LC 37: Sudoku Solver
- LC 441: Arranging Coins  Goal: Complete all 5 problems in 2.5 hours - demonstrate comprehensive understanding.

SYSTEM DESIGN: Complete URL Shortener

- Task: Present complete URL shortener system design
 - Include: All components from Week 4 (encoding, database, caching, scaling, analytics, security)
 - Bonus: Estimate system capacity and costs
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WEEK 5: BACKTRACKING & TREES (AUGUST 4-10)

MACHINE MODE: DAY 29 – AUGUST 4

DSA: Advanced Backtracking

- LC 52: N-Queens II
- LC 1079: Letter Tile Possibilities
- LC 1980: Find Unique Binary String
- LC 2044: Count Number of Maximum Bitwise-OR Subsets
- LC 1415: The k-th Lexicographical String of All Happy Strings  Goal: Master complex backtracking with optimization.

SYSTEM DESIGN: Pastebin - Requirements & APIs

- Watch: "Pastebin System Design" - Exponent
 - Task: Define functional and non-functional requirements
 - Bonus: Design REST APIs for create, read, update, delete operations
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MACHINE MODE: DAY 30 – AUGUST 5

DSA: Binary Trees Basics

- LC 144: Binary Tree Preorder Traversal
- LC 94: Binary Tree Inorder Traversal
- LC 145: Binary Tree Postorder Traversal
- LC 102: Binary Tree Level Order Traversal
- LC 104: Maximum Depth of Binary Tree  Goal: Master tree traversal algorithms (DFS and BFS).

SYSTEM DESIGN: Pastebin - Database Schema

- Watch: "Database Design Patterns" - Hussein Nasser
- Task: Design database schema for pastes with metadata

- Bonus: Implement soft deletion and version control
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✿ MACHINE MODE: DAY 31 – AUGUST 6

🎯 DSA: Binary Trees Properties

- LC 110: Balanced Binary Tree
- LC 111: Minimum Depth of Binary Tree
- LC 112: Path Sum
- LC 113: Path Sum II
- LC 226: Invert Binary Tree ✨ Goal: Understand tree properties and recursive solutions.

💬 SYSTEM DESIGN: Pastebin - Expiration Logic

- Watch: "TTL and Expiration Strategies" - System Design Interview
 - Task: Design automatic expiration system with different TTL options
 - Bonus: Implement lazy deletion and background cleanup jobs
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✿ MACHINE MODE: DAY 32 – AUGUST 7

🎯 DSA: Binary Trees Advanced

- LC 98: Validate Binary Search Tree
- LC 235: Lowest Common Ancestor of BST
- LC 236: Lowest Common Ancestor of Binary Tree
- LC 105: Construct Binary Tree from Preorder and Inorder
- LC 106: Construct Binary Tree from Inorder and Postorder ✨ Goal: Master BST properties and tree construction.

💬 SYSTEM DESIGN: Pastebin - Storage Strategy

- Watch: "Object Storage vs Database" - AWS
 - Task: Design hybrid storage (metadata in DB, content in object storage)
 - Bonus: Implement content compression and deduplication
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✿ MACHINE MODE: DAY 33 – AUGUST 8

🎯 DSA: BST Operations

- LC 700: Search in a Binary Search Tree
- LC 701: Insert into a Binary Search Tree
- LC 450: Delete Node in a BST
- LC 108: Convert Sorted Array to Binary Search Tree
- LC 230: Kth Smallest Element in a BST  Goal: Master BST operations and maintain BST properties.

SYSTEM DESIGN: Pastebin - Caching & CDN

- Watch: "CDN and Caching" - Fireship
 - Task: Design multi-tier caching for popular pastes
 - Bonus: Implement cache invalidation and regional CDN distribution
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MACHINE MODE: DAY 34 – AUGUST 9

DSA: Tree Challenges

- LC 124: Binary Tree Maximum Path Sum
- LC 297: Serialize and Deserialize Binary Tree
- LC 662: Maximum Width of Binary Tree
- LC 199: Binary Tree Right Side View
- LC 103: Binary Tree Zigzag Level Order Traversal  Goal: Solve complex tree problems with multiple approaches.

SYSTEM DESIGN: Pastebin - Security & Privacy

- Watch: "Security Best Practices" - OWASP
 - Task: Implement access control, encryption, and privacy features
 - Bonus: Add private pastes, password protection, and audit logging
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MACHINE MODE: DAY 35 – AUGUST 10

DSA: Week 5 Final Assessment

- LC 140: Word Break II
- LC 47: Permutations II
- LC 114: Flatten Binary Tree to Linked List
- LC 116: Populating Next Right Pointers in Each Node

- LC 212: Word Search II  Goal: Complete all 5 problems in 3 hours - demonstrate advanced problem-solving skills.

SYSTEM DESIGN: Complete Pastebin System

- Task: Present end-to-end Pastebin system design
 - Include: All Week 5 components (APIs, database, expiration, storage, caching, security)
 - Bonus: Calculate system metrics and design monitoring dashboard
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WEEK 6: TREES ADVANCED & WHATSAPP (AUGUST 11-17)

MACHINE MODE: DAY 36 – AUGUST 11

DSA: Tree Traversal Mastery

- LC 987: Vertical Order Traversal of a Binary Tree
- LC 314: Binary Tree Vertical Order Traversal
- LC 863: All Nodes Distance K in Binary Tree
- LC 1161: Maximum Level Sum of a Binary Tree
- LC 1026: Maximum Difference Between Node and Ancestor  Goal: Master complex traversal patterns and coordinate systems.

SYSTEM DESIGN: WhatsApp - Core Architecture

- Watch: "WhatsApp System Design" - Concept && Coding
 - Task: Design high-level architecture for messaging system
 - Bonus: Estimate user base, messages per second, and storage requirements
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MACHINE MODE: DAY 37 – AUGUST 12

DSA: LCA and Path Problems

- LC 1123: Lowest Common Ancestor of Deepest Leaves
- LC 1650: Lowest Common Ancestor of a Binary Tree III
- LC 1644: Lowest Common Ancestor of a Binary Tree II
- LC 2096: Step-By-Step Directions From a Binary Tree Node to Another
- LC 1372: Longest ZigZag Path in a Binary Tree  Goal: Master ancestor finding and path calculation algorithms.

SYSTEM DESIGN: WhatsApp - Message Delivery

- Watch: "Message Queue Systems" - Tech Dummies
 - Task: Design message routing and delivery system
 - Bonus: Handle offline users and message persistence
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MACHINE MODE: DAY 38 – AUGUST 13

DSA: Tree Modification

- LC 1367: Linked List in Binary Tree
- LC 1110: Delete Nodes And Return Forest
- LC 1325: Delete Leaves With a Given Value
- LC 1145: Binary Tree Coloring Game
- LC 1028: Recover a Tree From Preorder Traversal  Goal: Master tree modification and validation algorithms.

SYSTEM DESIGN: WhatsApp - Real-time Communication

- Watch: "WebSocket vs Socket.io" - Hussein Nasser
 - Task: Design real-time messaging with WebSocket connections
 - Bonus: Handle connection management and message ordering
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MACHINE MODE: DAY 39 – AUGUST 14

DSA: Binary Tree Advanced

- LC 968: Binary Tree Cameras
- LC 979: Distribute Coins in Binary Tree
- LC 1448: Count Good Nodes in Binary Tree
- LC 1379: Find a Corresponding Node of a Binary Tree in a Clone
- LC 1469: Find All The Lonely Nodes  Goal: Solve optimization problems on trees using DFS.

SYSTEM DESIGN: WhatsApp - Group Messaging

- Watch: "Group Chat Architecture" - System Design Interview
 - Task: Design group message distribution and member management
 - Bonus: Optimize for large groups and handle admin permissions
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🌟 MACHINE MODE: DAY 40 – AUGUST 15

🎯 DSA: Tree DP and Optimization

- LC 337: House Robber III
- LC 543: Diameter of Binary Tree
- LC 687: Longest Univalue Path
- LC 1130: Minimum Cost Tree From Leaf Values
- LC 1617: Count Subtrees With Max Distance Between Cities ↗ Goal: Apply dynamic programming concepts to tree problems.

💬 SYSTEM DESIGN: WhatsApp - Contact Synchronization

- Watch: "Contact Sync Architecture" - Mobile System Design
 - Task: Design contact discovery and friend suggestion system
 - Bonus: Handle privacy concerns and phone number hashing
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🌟 MACHINE MODE: DAY 41 – AUGUST 16

🎯 DSA: Week 6 Complex Challenge

- LC 1008: Construct Binary Search Tree from Preorder Traversal
- LC 1038: Binary Search Tree to Greater Sum Tree
- LC 1530: Number of Good Leaf Nodes Pairs
- LC 1339: Maximum Product of Splitted Binary Tree
- LC 1766: Tree of Coprimes ↗ Goal: Complete all 5 problems in 2.5 hours - demonstrate mastery of advanced tree algorithms.

💬 SYSTEM DESIGN: WhatsApp - Media Sharing

- Watch: "Media Storage and CDN" - ByteByteGo
 - Task: Design image/video sharing with compression and CDN
 - Bonus: Implement progressive image loading and thumbnail generation
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🌟 MACHINE MODE: DAY 42 – AUGUST 17

🎯 DSA: Tree Algorithm Integration

- LC 1302: Deepest Leaves Sum

- LC 1315: Sum of Nodes with Even-Valued Grandparent
- LC 1457: Pseudo-Palindromic Paths in a Binary Tree
- LC 1519: Number of Nodes in the Sub-Tree With the Same Label
- LC 1022: Sum of Root To Leaf Binary Numbers  Goal: Apply multiple tree concepts in single solutions.

SYSTEM DESIGN: Complete WhatsApp System

- Task: Present comprehensive WhatsApp backend architecture
 - Include: All Week 6 components (messaging, real-time, groups, contacts, media)
 - Bonus: Design end-to-end encryption and key management
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WEEK 7: GRAPHS I & YOUTUBE (AUGUST 18-24)

MACHINE MODE: DAY 43 – AUGUST 18

DSA: Graph Representation

- LC 1971: Find if Path Exists in Graph
- LC 797: All Paths From Source to Target
- LC 1557: Minimum Number of Vertices to Reach All Nodes
- LC 1791: Find Center of Star Graph
- LC 2000: Reverse Prefix of Word  Goal: Master graph representation (adjacency list, matrix) and basic traversal.

SYSTEM DESIGN: YouTube - High-Level Architecture

- Watch: "YouTube System Design" - Gaurav Sen
 - Task: Design video platform architecture (upload, storage, streaming)
 - Bonus: Calculate bandwidth requirements and storage costs
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MACHINE MODE: DAY 44 – AUGUST 19

DSA: DFS Applications

- LC 200: Number of Islands
- LC 695: Max Area of Island
- LC 133: Clone Graph

- LC 130: Surrounded Regions
- LC 417: Pacific Atlantic Water Flow ↗ Goal: Master DFS for connectivity and area problems.

💬 SYSTEM DESIGN: YouTube - Video Processing Pipeline

- Watch: "Video Processing Architecture" - ByteByteGo
 - Task: Design video encoding, transcoding, and quality adaptation
 - Bonus: Implement parallel processing and error handling
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✳️ MACHINE MODE: DAY 45 – AUGUST 20

🎯 DSA: BFS Applications

- LC 102: Binary Tree Level Order Traversal
- LC 994: Rotting Oranges
- LC 1926: Nearest Exit from Entrance in Maze
- LC 1091: Shortest Path in Binary Matrix
- LC 542: 01 Matrix ↗ Goal: Master BFS for shortest path and level-based problems.

💬 SYSTEM DESIGN: YouTube - Content Delivery Network

- Watch: "CDN Deep Dive" - Hussein Nasser
 - Task: Design global video distribution with edge servers
 - Bonus: Implement adaptive bitrate streaming and caching strategies
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✳️ MACHINE MODE: DAY 46 – AUGUST 21

🎯 DSA: Connected Components

- LC 547: Number of Provinces
- LC 1319: Number of Operations to Make Network Connected
- LC 684: Redundant Connection
- LC 1267: Count Servers that Communicate
- LC 1202: Smallest String With Swaps ↗ Goal: Understand connected components and union-find basics.

💬 SYSTEM DESIGN: YouTube - Recommendation System

- Watch: "Recommendation Systems" - FireShip

- Task: Design video recommendation engine with ML pipeline
 - Bonus: Implement collaborative filtering and content-based filtering
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🌟 MACHINE MODE: DAY 47 – AUGUST 22

🎯 DSA: Cycle Detection

- LC 207: Course Schedule
- LC 210: Course Schedule II
- LC 802: Find Eventual Safe States
- LC 1059: All Paths from Source Lead to Destination
- LC 1136: Parallel Courses 💡 Goal: Master cycle detection in directed graphs using DFS and topological sort.

💬 SYSTEM DESIGN: YouTube - Comments & Engagement

- Watch: "Comments System Design" - Concept && Coding
 - Task: Design comment system with threading, voting, and moderation
 - Bonus: Implement real-time comment updates and spam detection
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🌟 MACHINE MODE: DAY 48 – AUGUST 23

🎯 DSA: Topological Sort

- LC 269: Alien Dictionary
- LC 310: Minimum Height Trees
- LC 1203: Sort Items by Groups Respecting Dependencies
- LC 1462: Course Schedule IV
- LC 2115: Find All Possible Recipes from Given Supplies 💡 Goal: Master topological sorting algorithms and dependency resolution.

💬 SYSTEM DESIGN: YouTube - Analytics & Monitoring

- Watch: "Analytics Pipeline" - Data Engineering
 - Task: Design real-time analytics for views, engagement, and performance
 - Bonus: Implement A/B testing framework and metrics collection
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🌟 MACHINE MODE: DAY 49 – AUGUST 24

DSA: Week 7 Graph Mastery

- LC 1376: Time Needed to Inform All Employees
- LC 1129: Shortest Path with Alternating Colors
- LC 1466: Reorder Routes to Make All Paths Lead to the City Zero
- LC 323: Number of Connected Components in an Undirected Graph
- LC 261: Graph Valid Tree  Goal: Complete all 5 problems in 2.5 hours - demonstrate comprehensive graph algorithm mastery.

SYSTEM DESIGN: Complete YouTube System

- Task: Present end-to-end YouTube architecture
 - Include: All Week 7 components (architecture, processing, CDN, recommendations, comments, analytics)
 - Bonus: Design monetization system and creator dashboard
-

WEEK 8: GRAPHS II & UBER (AUGUST 25-31)

MACHINE MODE: DAY 50 – AUGUST 25

DSA: Shortest Path Algorithms

- LC 743: Network Delay Time
- LC 787: Cheapest Flights Within K Stops
- LC 1334: Find the City With the Smallest Number of Neighbors at a Threshold Distance
- LC 1631: Path With Minimum Effort
- LC 1514: Path with Maximum Probability  Goal: Master Dijkstra's algorithm and weighted graph problems.

SYSTEM DESIGN: Uber - Core Architecture

- Watch: "Uber System Design" - Success in Tech
 - Task: Design ride-hailing platform architecture (drivers, riders, matching)
 - Bonus: Estimate global scale requirements and regional variations
-

MACHINE MODE: DAY 51 – AUGUST 26

DSA: Union-Find (Disjoint Set)

- LC 684: Redundant Connection
- LC 685: Redundant Connection II
- LC 1584: Min Cost to Connect All Points
- LC 1168: Optimize Water Distribution in a Village
- LC 952: Largest Component Size by Common Factor  Goal: Master union-find data structure with path compression and union by rank.

SYSTEM DESIGN: Uber - Location Services

- Watch: "Geospatial Indexing" - Hussein Nasser
 - Task: Design location tracking and geospatial queries (QuadTree, Geohash)
 - Bonus: Implement efficient nearest driver search algorithms
-

MACHINE MODE: DAY 52 – AUGUST 27

DSA: Minimum Spanning Tree

- LC 1584: Min Cost to Connect All Points
- LC 1135: Connecting Cities With Minimum Cost
- LC 1489: Find Critical and Pseudo-Critical Edges in MST
- LC 1579: Remove Max Number of Edges to Keep Graph Fully Traversable
- LC 1697: Checking Existence of Edge Length Limited Paths  Goal: Master Kruskal's and Prim's algorithms for MST problems.

SYSTEM DESIGN: Uber - Real-time Matching

- Watch: "Real-time Matching Algorithms" - System Design Interview
 - Task: Design driver-rider matching with supply-demand optimization
 - Bonus: Handle surge pricing and demand prediction
-

MACHINE MODE: DAY 53 – AUGUST 28

DSA: Advanced Graph Algorithms

- LC 785: Is Graph Bipartite?
- LC 886: Possible Bipartition
- LC 1042: Flower Planting With No Adjacent
- LC 1349: Maximum Students Taking Exam

- LC 1559: Detect Cycles in 2D Grid  Goal: Master bipartite graphs and advanced graph coloring problems.

SYSTEM DESIGN: Uber - Trip Management

- Watch: "State Machines in System Design" - ByteByteGo
 - Task: Design trip lifecycle (request, match, pickup, transit, completion)
 - Bonus: Handle cancellations, route optimization, and fare calculation
-

MACHINE MODE: DAY 54 – AUGUST 29

DSA: Graph with Matrix

- LC 1254: Number of Closed Islands
- LC 1905: Count Sub Islands
- LC 827: Making A Large Island
- LC 778: Swim in Rising Water
- LC 1162: As Far from Land as Possible  Goal: Apply graph algorithms to 2D matrix problems efficiently.

SYSTEM DESIGN: Uber - Payment Processing

- Watch: "Payment System Design" - Concept && Coding
 - Task: Design payment processing with multiple payment methods
 - Bonus: Handle payment failures, refunds, and financial reconciliation
-

MACHINE MODE: DAY 55 – AUGUST 30

DSA: Graph Optimization

- LC 1928: Minimum Cost to Reach Destination in Time
- LC 1976: Number of Ways to Arrive at Destination
- LC 1786: Number of Restricted Paths From First to Last Node
- LC 1724: Checking Existence of Edge Length Limited Paths II
- LC 2045: Second Minimum Time to Reach Destination  Goal: Solve complex optimization problems on graphs.

SYSTEM DESIGN: Uber - Analytics & ML Pipeline

- Watch: "ML Pipeline Architecture" - Fireship
 - Task: Design analytics for route optimization, demand forecasting, pricing
 - Bonus: Implement real-time fraud detection and driver behavior analysis
-

🌟 MACHINE MODE: DAY 56 – AUGUST 31

🎯 DSA: Week 8 Advanced Challenge

- LC 847: Shortest Path Visiting All Nodes
- LC 1377: Frog Position After T Seconds
- LC 1617: Count Subtrees With Max Distance Between Cities
- LC 1970: Last Day Where You Can Still Cross
- LC 2203: Minimum Weighted Subgraph With the Required Paths 🌟 Goal: Complete all 5 problems in 3 hours - demonstrate mastery of advanced graph algorithms.

💬 SYSTEM DESIGN: Complete Uber System

- Task: Present comprehensive Uber backend architecture
 - Include: All Week 8 components (architecture, location services, matching, trips, payments, analytics)
 - Bonus: Design multi-city expansion strategy and regulatory compliance
-

WEEK 9: DYNAMIC PROGRAMMING I & TWITTER (SEPTEMBER 1-7)

🌟 MACHINE MODE: DAY 57 – SEPTEMBER 1

🎯 DSA: DP Fundamentals

- LC 70: Climbing Stairs
- LC 198: House Robber
- LC 213: House Robber II
- LC 740: Delete and Earn
- LC 55: Jump Game 🌟 Goal: Master basic DP patterns and state transitions.

💬 SYSTEM DESIGN: Twitter - Core Architecture

- Watch: "Twitter System Design" - Gaurav Sen
 - Task: Design Twitter-like social media platform architecture
 - Bonus: Estimate tweet volume, user interactions, and storage requirements
-

🌟 MACHINE MODE: DAY 58 – SEPTEMBER 2

🎯 DSA: 1D DP Problems

- LC 322: Coin Change
- LC 279: Perfect Squares
- LC 139: Word Break
- LC 300: Longest Increasing Subsequence
- LC 673: Number of Longest Increasing Subsequence 💡 Goal: Master 1D DP with memoization and tabulation approaches.

💬 SYSTEM DESIGN: Twitter - Feed Generation (Pull Model)

- Watch: "Pull vs Push Models" - System Design Interview
 - Task: Design timeline generation using pull model (read-time aggregation)
 - Bonus: Optimize query performance and handle celebrity users
-

🌟 MACHINE MODE: DAY 59 – SEPTEMBER 3

🎯 DSA: 2D DP Introduction

- LC 62: Unique Paths
- LC 63: Unique Paths II
- LC 64: Minimum Path Sum
- LC 120: Triangle
- LC 931: Minimum Falling Path Sum 💡 Goal: Master 2D DP grid problems and path optimization.

💬 SYSTEM DESIGN: Twitter - Feed Generation (Push Model)

- Watch: "Fanout Strategies" - ByteByteGo
 - Task: Design timeline generation using push model (write-time fanout)
 - Bonus: Handle mixed approach for different user types and follower counts
-

🌟 MACHINE MODE: DAY 60 – SEPTEMBER 4

🎯 DSA: Knapsack Problems

- LC 416: Partition Equal Subset Sum
- LC 494: Target Sum

- LC 1049: Last Stone Weight II
- LC 474: Ones and Zeroes
- LC 879: Profitable Schemes  Goal: Master 0/1 knapsack and unbounded knapsack variations.

SYSTEM DESIGN: Twitter - Caching Strategy

- Watch: "Caching for Social Media" - Hussein Nasser
 - Task: Design multi-layer caching for feeds, user data, and trending topics
 - Bonus: Implement cache invalidation strategies and consistency models
-

MACHINE MODE: DAY 61 – SEPTEMBER 5

DSA: String DP

- LC 72: Edit Distance
- LC 44: Wildcard Matching
- LC 10: Regular Expression Matching
- LC 115: Distinct Subsequences
- LC 97: Interleaving String  Goal: Master string matching and transformation DP problems.

SYSTEM DESIGN: Twitter - Search & Trending

- Watch: "Search Engine Architecture" - Fireship
 - Task: Design tweet search with real-time indexing and trending topics
 - Bonus: Implement autocomplete, hashtag tracking, and spam detection
-

MACHINE MODE: DAY 62 – SEPTEMBER 6

DSA: Advanced DP Patterns

- LC 647: Palindromic Substrings
- LC 5: Longest Palindromic Substring
- LC 516: Longest Palindromic Subsequence
- LC 1143: Longest Common Subsequence
- LC 718: Maximum Length of Repeated Subarray  Goal: Master palindrome and subsequence DP patterns.

SYSTEM DESIGN: Twitter - Notifications System

- Watch: "Notification System Design" - Success in Tech
 - Task: Design real-time notifications for mentions, likes, retweets
 - Bonus: Implement push notifications, email digests, and user preferences
-

🌟 MACHINE MODE: DAY 63 – SEPTEMBER 7

🎯 DSA: Week 9 DP Assessment

- LC 1312: Minimum Insertion Steps to Make a String Palindrome
- LC 1035: Uncrossed Lines
- LC 1458: Max Dot Product of Two Subsequences
- LC 1289: Minimum Falling Path Sum II
- LC 1444: Number of Ways of Cutting a Pizza 🌟 Goal: Complete all 5 problems in 3 hours - demonstrate comprehensive DP problem-solving skills.

💬 SYSTEM DESIGN: Complete Twitter System

- Task: Present end-to-end Twitter architecture
 - Include: All Week 9 components (architecture, feed generation, caching, search, notifications)
 - Bonus: Design content moderation and analytics dashboard
-

WEEK 10: DYNAMIC PROGRAMMING II & NOTIFICATIONS (SEPTEMBER 8-14)

🌟 MACHINE MODE: DAY 64 – SEPTEMBER 8

🎯 DSA: DP on Trees

- LC 337: House Robber III
- LC 968: Binary Tree Cameras
- LC 979: Distribute Coins in Binary Tree
- LC 1372: Longest ZigZag Path in a Binary Tree
- LC 2246: Longest Path With Different Adjacent Characters 🌟 Goal: Apply DP concepts to tree data structures.

💬 SYSTEM DESIGN: Notification System - Architecture

- Watch: "Notification Service Design" - ByteByteGo
- Task: Design scalable notification system supporting multiple channels

- Bonus: Handle notification priorities and delivery guarantees
-

★ MACHINE MODE: DAY 65 – SEPTEMBER 9

🎯 DSA: Interval DP

- LC 1039: Minimum Score Triangulation of Polygon
- LC 1000: Minimum Cost to Merge Stones
- LC 312: Burst Balloons
- LC 1547: Minimum Cost to Cut a Stick
- LC 1278: Palindrome Partitioning III ↗ Goal: Master interval DP for range optimization problems.

💬 SYSTEM DESIGN: Push Notifications

- Watch: "Push Notification Architecture" - Mobile System Design
 - Task: Design push notification system for mobile and web platforms
 - Bonus: Handle device token management and notification batching
-

★ MACHINE MODE: DAY 66 – SEPTEMBER 10

🎯 DSA: State Machine DP

- LC 309: Best Time to Buy and Sell Stock with Cooldown
- LC 714: Best Time to Buy and Sell Stock with Transaction Fee
- LC 188: Best Time to Buy and Sell Stock IV
- LC 1824: Minimum Sideway Jumps
- LC 1220: Count Vowels Permutation ↗ Goal: Model complex state transitions in DP problems.

💬 SYSTEM DESIGN: Email Notifications

- Watch: "Email Service Architecture" - System Design Interview
 - Task: Design email notification system with templates and scheduling
 - Bonus: Implement email delivery tracking and bounce handling
-

★ MACHINE MODE: DAY 67 – SEPTEMBER 11

🎯 DSA: Digit DP

- LC 233: Number of Digit One

- LC 357: Count Numbers with Unique Digits
- LC 902: Numbers At Most N Given Digit Set
- LC 1012: Numbers With Repeated Digits
- LC 1067: Digit Count in Range ↗ Goal: Master digit DP for counting problems with constraints.

💬 SYSTEM DESIGN: SMS & In-App Notifications

- Watch: "SMS Gateway Architecture" - Twilio
 - Task: Design SMS delivery system and in-app notification service
 - Bonus: Handle international SMS routing and real-time message delivery
-

✳️ MACHINE MODE: DAY 68 – SEPTEMBER 12

🎯 DSA: Bitmask DP

- LC 847: Shortest Path Visiting All Nodes
- LC 943: Find the Shortest Superstring
- LC 1125: Smallest Sufficient Team
- LC 1986: Minimum Number of Work Sessions to Finish the Tasks
- LC 1681: Minimum Incompatibility ↗ Goal: Use bitmasks to represent states in DP problems.

💬 SYSTEM DESIGN: Notification Preferences

- Watch: "User Preference Management" - System Design
 - Task: Design user preference system for notification channels and frequency
 - Bonus: Implement smart notification bundling and quiet hours
-

✳️ MACHINE MODE: DAY 69 – SEPTEMBER 13

🎯 DSA: Probability DP

- LC 688: Knight Probability in Chessboard
- LC 837: New 21 Game
- LC 1230: Toss Strange Coins
- LC 1467: Probability of a Two Boxes Having The Same Number of Distinct Balls
- LC 1515: Best Position for a Service Centre ↗ Goal: Apply DP to probability and expected value problems.

SYSTEM DESIGN: Notification Analytics

- Watch: "Analytics Pipeline" - Data Engineering
 - Task: Design analytics system for notification delivery rates and engagement
 - Bonus: Implement A/B testing for notification content and timing
-

MACHINE MODE: DAY 70 – SEPTEMBER 14

DSA: Week 10 Advanced DP

- LC 1595: Minimum Cost to Connect Two Groups of Points
- LC 1473: Paint House III
- LC 1434: Number of Ways to Wear Different Hats to Each Other
- LC 1655: Distribute Repeating Integers
- LC 1692: Count Ways to Distribute Candies  Goal: Complete all 5 problems in 3 hours - demonstrate mastery of advanced DP techniques.

SYSTEM DESIGN: Complete Notification System

- Task: Present comprehensive notification system architecture
 - Include: All Week 10 components (architecture, push/email/SMS, preferences, analytics)
 - Bonus: Design disaster recovery and global distribution strategy
-

WEEK 11: GREEDY & SYSTEM DESIGN REVISION (SEPTEMBER 15-21)

MACHINE MODE: DAY 71 – SEPTEMBER 15

DSA: Greedy Basics

- LC 455: Assign Cookies
- LC 860: Lemonade Change
- LC 1221: Split a String in Balanced Strings
- LC 1323: Maximum 69 Number
- LC 1710: Maximum Units on a Truck  Goal: Master greedy algorithm fundamentals and proof techniques.

SYSTEM DESIGN: Revision - URL Shortener & Pastebin

- Task: Redraw URL Shortener and Pastebin architectures from memory

- Include: All components, data flow, and scaling considerations
 - Bonus: Compare trade-offs between the two systems
-

🌟 MACHINE MODE: DAY 72 – SEPTEMBER 16

🎯 DSA: Interval Scheduling

- LC 55: Jump Game
- LC 45: Jump Game II
- LC 435: Non-overlapping Intervals
- LC 452: Minimum Number of Arrows to Burst Balloons
- LC 646: Maximum Length of Pair Chain ↗ Goal: Master interval scheduling and activity selection problems.

💬 SYSTEM DESIGN: Revision - WhatsApp & YouTube

- Task: Redraw WhatsApp and YouTube architectures from memory
 - Include: Key components, data models, and performance optimizations
 - Bonus: Identify common patterns between messaging and media platforms
-

🌟 MACHINE MODE: DAY 73 – SEPTEMBER 17

🎯 DSA: Greedy on Arrays

- LC 134: Gas Station
- LC 135: Candy
- LC 334: Increasing Triplet Subsequence
- LC 376: Wiggle Subsequence
- LC 402: Remove K Digits ↗ Goal: Apply greedy strategies to array optimization problems.

💬 SYSTEM DESIGN: Revision - Uber & Twitter

- Task: Redraw Uber and Twitter architectures from memory
 - Include: Real-time components, matching algorithms, feed generation
 - Bonus: Compare real-time requirements across different domains
-

🌟 MACHINE MODE: DAY 74 – SEPTEMBER 18

🎯 DSA: Meeting Rooms & Scheduling

- LC 253: Meeting Rooms II
- LC 1094: Car Pooling
- LC 1851: Minimum Interval to Include Each Query
- LC 1353: Maximum Number of Events That Can Be Attended
- LC 1235: Maximum Profit in Job Scheduling  Goal: Master resource allocation and scheduling optimization.

SYSTEM DESIGN: Revision - Notification System

- Task: Redraw complete notification system from memory
 - Include: Multi-channel delivery, preferences, analytics
 - Bonus: Design notification system for a specific use case (e-commerce alerts)
-

MACHINE MODE: DAY 75 – SEPTEMBER 19

DSA: String Greedy

- LC 763: Partition Labels
- LC 678: Valid Parenthesis String
- LC 1717: Maximum Score From Removing Substrings
- LC 1754: Largest Merge Of Two Strings
- LC 1247: Minimum Swaps to Make Strings Equal  Goal: Apply greedy algorithms to string manipulation problems.

SYSTEM DESIGN: Cross-System Integration

- Task: Design system that integrates multiple previous designs
 - Example: Social media platform with messaging, file sharing, notifications
 - Bonus: Identify reusable components and design patterns
-

MACHINE MODE: DAY 76 – SEPTEMBER 20

DSA: Advanced Greedy

- LC 502: IPO
- LC 630: Course Schedule III
- LC 1675: Minimize Deviation in Array

- LC 1383: Maximum Performance of a Team
- LC 1199: Minimum Time to Build Blocks  Goal: Solve complex optimization problems using greedy approaches.

SYSTEM DESIGN: Performance & Scaling Patterns

- Task: Review common scaling patterns across all previous systems
 - Include: Caching strategies, database sharding, load balancing
 - Bonus: Create scaling playbook for different system types
-

MACHINE MODE: DAY 77 – SEPTEMBER 21

DSA: Week 11 Mixed Challenge

- LC 1526: Minimum Number of Increments on Subarrays to Form a Target Array
- LC 1665: Minimum Initial Energy to Finish Tasks
- LC 1899: Merge Triplets to Form Target Triplet
- LC 2126: Destroying Asteroids
- LC 300: Longest Increasing Subsequence (DP revision)  Goal: Complete all 5 problems in 2.5 hours
- demonstrate algorithm selection and pattern recognition.

SYSTEM DESIGN: Week 11 Comprehensive Review

- Task: Create comparison matrix of all 5 systems designed so far
 - Include: Architecture patterns, data models, scaling strategies, trade-offs
 - Bonus: Design hybrid system combining features from multiple systems
-

WEEK 12: MIXED REVISION & MOCK PREP (SEPTEMBER 22-28)

MACHINE MODE: DAY 78 – SEPTEMBER 22

DSA: Easy Mixed Practice (Speed Focus)

- LC 1: Two Sum
- LC 121: Best Time to Buy and Sell Stock
- LC 20: Valid Parentheses
- LC 206: Reverse Linked List
- LC 104: Maximum Depth of Binary Tree

- LC 200: Number of Islands
- LC 70: Climbing Stairs
- LC 242: Valid Anagram
- LC 125: Valid Palindrome
- LC 283: Move Zeroes  Goal: Complete 10 easy problems in 60 minutes - build speed and confidence.

SYSTEM DESIGN: Mock Question - Design Instagram

- Watch: "Instagram System Design" - Success in Tech
 - Task: Complete Instagram design in 45 minutes (timed practice)
 - Include: Photo upload, feed generation, stories, search
 - Bonus: Handle image processing and global CDN distribution
-

MACHINE MODE: DAY 79 – SEPTEMBER 23

DSA: Medium Mixed Practice

- LC 15: 3Sum
- LC 33: Search in Rotated Sorted Array
- LC 46: Permutations
- LC 102: Binary Tree Level Order Traversal
- LC 207: Course Schedule
- LC 322: Coin Change
- LC 435: Non-overlapping Intervals
- LC 76: Minimum Window Substring  Goal: Complete 8 medium problems in 90 minutes - maintain accuracy under time pressure.

SYSTEM DESIGN: Mock Question - Design Netflix

- Watch: "Netflix System Design" - Concept && Coding
 - Task: Complete Netflix design in 45 minutes (timed practice)
 - Include: Video streaming, recommendation system, user profiles, content delivery
 - Bonus: Handle content encoding and global streaming optimization
-

MACHINE MODE: DAY 80 – SEPTEMBER 24

DSA: Hard Problem Practice

- LC 42: Trapping Rain Water
- LC 124: Binary Tree Maximum Path Sum
- LC 84: Largest Rectangle in Histogram
- LC 72: Edit Distance
- LC 297: Serialize and Deserialize Binary Tree  Goal: Complete 5 hard problems in 90 minutes - develop systematic approach to complex problems.

SYSTEM DESIGN: Mock Question - Design Slack

- Watch: "Slack System Design" - ByteByteGo
 - Task: Complete Slack design in 45 minutes (timed practice)
 - Include: Real-time messaging, channels, file sharing, search
 - Bonus: Handle workspace management and notification systems
-

MACHINE MODE: DAY 81 – SEPTEMBER 25

DSA: Algorithm Pattern Review

- LC 169: Majority Element (Boyer-Moore)
- LC 167: Two Sum II (Two Pointers)
- LC 3: Longest Substring Without Repeating Characters (Sliding Window)
- LC 155: Min Stack (Stack)
- LC 141: Linked List Cycle (Floyd's Cycle Detection)
- LC 98: Validate Binary Search Tree (Tree Traversal)
- LC 133: Clone Graph (Graph DFS)
- LC 198: House Robber (DP)
- LC 55: Jump Game (Greedy)
- LC 34: Find First and Last Position (Binary Search)  Goal: Complete 10 problems covering all major patterns - reinforce pattern recognition.

SYSTEM DESIGN: Pattern Recognition Practice

- Task: Quick 15-minute design sketches for 3 different systems
- Systems: Design Dropbox, Design Zoom, Design Airbnb
- Focus: Identify core components and data flow quickly

- Bonus: Note common patterns across storage, communication, and marketplace systems
-

🌟 MACHINE MODE: DAY 82 – SEPTEMBER 26

🎯 DSA: Interview Simulation

- LC 236: Lowest Common Ancestor of Binary Tree
- LC 417: Pacific Atlantic Water Flow
- LC 139: Word Break 💡 Goal: Solve 3 problems with full explanation (as if interviewing) - practice clear communication.

💬 SYSTEM DESIGN: Communication Practice

- Task: Record 20-minute system design explanation
 - System: Choose one from previous weeks
 - Focus: Clear communication, assumption clarification, trade-off discussion
 - Bonus: Practice handling follow-up questions and deep dives
-

🌟 MACHINE MODE: DAY 83 – SEPTEMBER 27

🎯 DSA: Weak Area Focus

- Task: Identify 2 weakest topics from weeks 1-11
- Solve 8 problems from those topics in 2 hours 💡 Goal: Strengthen specific weak areas before mock interviews.

💬 SYSTEM DESIGN: Estimation Practice

- Task: Practice back-of-envelope calculations for previous systems
 - Include: Storage requirements, bandwidth, QPS, server count
 - Focus: Quick mental math and reasonable assumptions
 - Bonus: Create estimation cheat sheet for common calculations
-

🌟 MACHINE MODE: DAY 84 – SEPTEMBER 28

🎯 DSA: Final Algorithm Review

- Complete comprehensive review quiz
- Solve 15 mixed problems (5 easy, 7 medium, 3 hard) in 2.5 hours

- Cover all major topics from weeks 1-11  Goal: Final assessment before intensive mock week.

SYSTEM DESIGN: Final System Review

- Task: Create one-page summaries for all 8 systems designed
 - Include: Key components, data models, scaling strategies
 - Create mental framework for approaching new system design questions
 - Bonus: Develop personal system design template and checklist
-

WEEK 13: MOCK WEEK 1 - PRESSURE TESTING (SEPTEMBER 29 - OCTOBER 5)

MACHINE MODE: DAY 85 – SEPTEMBER 29

DSA: Full Mock Interview #1

- Conduct 60-minute mock DSA interview
- Problems: 1 Easy (10 min), 1 Medium (25 min), 1 Hard (25 min)
- Record session and time each problem
- Focus: Communication, optimization, edge cases  Goal: Simulate real interview pressure and timing.

SYSTEM DESIGN: Mock Interview #1 - Design Twitter

- Conduct 45-minute mock system design interview
 - Record your explanation and diagramming
 - Focus: Requirements gathering, high-level design, detailed components
 - Bonus: Practice handling interviewer questions and design modifications
-

MACHINE MODE: DAY 86 – SEPTEMBER 30

DSA: Mock Analysis & Improvement

- Review Day 85 recording
- Identify communication gaps and timing issues
- Re-solve problematic questions with better approach
- Practice explaining solutions out loud  Goal: Learn from mistakes and improve interview technique.

SYSTEM DESIGN: Mock Analysis & Improvement

- Review Day 85 system design recording
 - Identify missing components and unclear explanations
 - Redesign system with better structure and communication
 - Focus: Clearer diagrams and logical flow
-

✿ MACHINE MODE: DAY 87 – OCTOBER 1

🎯 DSA: Full Mock Interview #2

- Conduct 60-minute mock DSA interview
- Problems: 1 Easy (8 min), 1 Medium (22 min), 1 Hard (30 min)
- Compare performance with Day 85
- Focus: Faster problem recognition and cleaner code ✨ Goal: Demonstrate improvement from first mock.

💬 SYSTEM DESIGN: Mock Interview #2 - Design Uber

- Conduct 45-minute mock system design interview
 - Apply lessons learned from Day 85
 - Focus: Better requirement clarification and component explanation
 - Bonus: Handle scale estimation and trade-off discussions
-

✿ MACHINE MODE: DAY 88 – OCTOBER 2

🎯 DSA: Targeted Weak Spots

- Focus on problem types that were challenging in mocks
- Solve 6 problems in areas that need improvement
- Time each problem and practice explanation ✨ Goal: Eliminate specific weaknesses identified in mock interviews.

💬 SYSTEM DESIGN: Advanced Mock - Design WhatsApp

- 45-minute mock focusing on real-time systems
 - Emphasize WebSocket connections and message delivery
 - Handle encryption and multi-device synchronization
 - Bonus: Design group messaging and media sharing
-

MACHINE MODE: DAY 89 – OCTOBER 3

DSA: Speed Building

- Solve 12 easy problems in 45 minutes
- Solve 6 medium problems in 60 minutes
- Focus: Quick pattern recognition and implementation  Goal: Build confidence and speed for interview day.

SYSTEM DESIGN: Advanced Mock - Design YouTube

- 45-minute mock focusing on large-scale systems
 - Emphasize video processing and global CDN
 - Handle recommendation algorithms and analytics
 - Bonus: Design monetization and creator tools
-

MACHINE MODE: DAY 90 – OCTOBER 4

DSA: Full Mock Interview #3

- Conduct 60-minute mock DSA interview
- Problems: 1 Easy (7 min), 1 Medium (20 min), 1 Hard (33 min)
- Aim for perfect communication and optimal solutions
- Focus: Interview presence and confidence  Goal: Demonstrate readiness for real interviews.

SYSTEM DESIGN: Mock Interview #3 - Design Instagram

- Conduct 45-minute mock with focus on mobile systems
 - Handle image processing and social features
 - Emphasize feed algorithms and user engagement
 - Bonus: Design stories feature and direct messaging
-

MACHINE MODE: DAY 91 – OCTOBER 5

DSA: Mock Week Analysis

- Comprehensive review of all 3 mock interviews
- Document improvement areas and success patterns

- Create personal interview strategy and checklist  Goal: Consolidate lessons learned from intensive mock practice.

SYSTEM DESIGN: Mock Week Analysis

- Comprehensive review of all system design mocks
 - Document common patterns and successful approaches
 - Create personal system design template
 - Bonus: Prepare for handling unexpected follow-up questions
-

WEEK 14: MOCK WEEK 2 - FINAL PREPARATION (OCTOBER 6-12)

MACHINE MODE: DAY 92 – OCTOBER 6

DSA: Company-Specific Practice - Google Style

- Focus on Google-style problems (complex algorithms, optimization)
- LC 31: Next Permutation
- LC 224: Basic Calculator
- LC 295: Find Median from Data Stream
- LC 128: Longest Consecutive Sequence  Goal: Practice company-specific problem styles and difficulty levels.

SYSTEM DESIGN: Company-Specific - Design Google Search

- Watch: "Google Search System Design" - Exponent
 - Task: Design web crawling, indexing, and ranking system
 - Include: PageRank algorithm and distributed crawling
 - Bonus: Handle query processing and result serving
-

MACHINE MODE: DAY 93 – OCTOBER 7

DSA: Company-Specific Practice - Meta/Facebook Style

- Focus on social media and graph problems
- LC 133: Clone Graph
- LC 301: Remove Invalid Parentheses
- LC 721: Accounts Merge

- LC 953: Verifying an Alien Dictionary ↗ Goal: Practice Meta-style problems focusing on social features and optimization.

💬 SYSTEM DESIGN: Company-Specific - Design Facebook News Feed

- Watch: "Facebook News Feed Design" - Success in Tech
 - Task: Design feed ranking, content distribution, and user engagement
 - Include: Edge rank algorithm and real-time updates
 - Bonus: Handle multimedia content and advertising integration
-

✳️ MACHINE MODE: DAY 94 – OCTOBER 8

🎯 DSA: Company-Specific Practice - Amazon Style

- Focus on practical problems and optimization
- LC 146: LRU Cache
- LC 692: Top K Frequent Words
- LC 1152: Analyze User Website Visit Pattern
- LC 957: Prison Cells After N Days ↗ Goal: Practice Amazon-style problems emphasizing real-world applications.

💬 SYSTEM DESIGN: Company-Specific - Design Amazon E-commerce

- Watch: "E-commerce System Design" - Concept && Coding
 - Task: Design product catalog, shopping cart, and order processing
 - Include: Inventory management and payment processing
 - Bonus: Handle recommendations and fraud detection
-

✳️ MACHINE MODE: DAY 95 – OCTOBER 9

🎯 DSA: Final Mock Interview #4

- Conduct 60-minute mock with perfect interview simulation
- Use problems you haven't seen before
- Focus: Optimal solutions with clear communication
- Record and analyze immediately after ↗ Goal: Final validation of interview readiness.

💬 SYSTEM DESIGN: Final Mock - Design Netflix

- Conduct 50-minute comprehensive mock
 - Cover all aspects: content delivery, recommendations, user management
 - Focus: Handling scale and global distribution
 - Bonus: Design content creation tools and analytics
-

🌟 MACHINE MODE: DAY 96 – OCTOBER 10

🎯 DSA: Confidence Building

- Solve 10 problems you've mastered before (5 easy, 3 medium, 2 hard)
- Focus: Speed and confidence for interview day
- Practice explaining solutions clearly and concisely ✨ Goal: Build confidence and maintain problem-solving momentum.

💬 SYSTEM DESIGN: Mental Framework Practice

- Practice 3 quick system designs (20 minutes each)
 - Systems: Design Zoom, Design Spotify, Design LinkedIn
 - Focus: Using consistent framework and clear communication
 - Bonus: Practice transitions between components and handling questions
-

🌟 MACHINE MODE: DAY 97 – OCTOBER 11

🎯 DSA: Interview Day Simulation

- Full 60-minute mock interview with new problems
- Simulate actual interview conditions (camera, shared screen)
- Focus: Professional communication and problem-solving process ✨ Goal: Final preparation for actual interview performance.

💬 SYSTEM DESIGN: Interview Day Simulation

- Full 45-minute system design with interviewer-style questions
 - Practice handling pushback and design modifications
 - Focus: Confidence and adaptability under pressure
 - Bonus: Practice explaining trade-offs and alternative approaches
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🌟 MACHINE MODE: DAY 98 – OCTOBER 12

DSA: Final Review & Relaxation

- Light review of key patterns and algorithms
- Solve 5 easy problems for confidence
- Review personal notes and common mistakes  Goal: Maintain readiness while avoiding burnout before interviews.

SYSTEM DESIGN: Final Review & Strategy

- Review system design template and key patterns
 - Practice drawing clean diagrams quickly
 - Prepare answers for common follow-up questions
 - Bonus: Review estimation techniques and scaling strategies
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FINAL PREPARATION DAYS (OCTOBER 13-15)

MACHINE MODE: DAY 99 – OCTOBER 13

DSA: Light Practice & Mental Preparation

- Solve 3 easy problems for confidence
- Review your most common mistakes and how to avoid them
- Practice positive self-talk and interview confidence  Goal: Maintain skills while preparing mentally for success.

SYSTEM DESIGN: Final Confidence Building

- Quick review of your strongest system designs
 - Practice opening statements and requirement gathering
 - Prepare for different interviewer styles and personalities
 - Bonus: Visualize successful interview performance
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MACHINE MODE: DAY 100 – OCTOBER 14

DSA: Rest & Final Preparation

- Review your personal algorithm cheat sheet
- Practice 1-2 easy problems maximum
- Prepare materials for interview day  Goal: Rest and mental preparation for peak performance.

SYSTEM DESIGN: Interview Day Preparation

- Review your system design template one final time
 - Prepare questions to ask the interviewer
 - Organize your workspace and technical setup
 - Bonus: Plan your schedule and logistics for interview day
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MACHINE MODE: DAY 101 – OCTOBER 15 - INTERVIEW DAY

THE EXECUTION

- Apply everything you've learned over 100 days
- Trust your preparation and training
- Execute with confidence and precision  Goal: Demonstrate your elite operator skills and secure your offer.

FINAL MISSION

- You are no longer a student - you are an elite operator
- 100 days of discipline have prepared you for this moment
- Execute with the precision of a machine

MISSION ACCOMPLISHED. WELCOME TO THE NEXT LEVEL.