

100-DAY MASTER STUDY PLAN: DSA & SYSTEM DESIGN

Domain: dynocode.in/dsa
Candidate:

Sep 19, 2026 – Dec 27, 2026 • 125 C++ Pattern Files • 74 HelloInterview HLD Units

Target: Senior / Staff SDE

TOTAL TIMELINE
100 Days

DSA COVERAGE
125 Pattern Files

SYSTEM DESIGN
74 HLD Units

TIMED MOCKS
8 Full Sessions

Daily Formula: Morning (60–75m): Code C++ Pattern File from scratch. Evening (45–60m): System Design Architecture & Tradeoffs. **Weekend:** Review & 45-min Mock.

DAY / DATE	DSA PATTERN FILE & TOPIC	SYSTEM DESIGN (HLD) CONCEPT / ARCHETYPE	FOCUS THEME	[]
Day 01 Sep 19	SlidingWindowTwoPointer/00_PatternsOverview.cpp Patterns Classification & Templates	Evaluation Framework: 4 Core Pillars Problem Navigation, Solution Design, Technical Excellence, Collaboration	FOUNDATIONS & FRAME	☐
Day 02 Sep 20	SlidingWindowTwoPointer/01_FixedWindowSize.cpp Fixed Size Window: Max Sum, Anagrams	Delivery Step 1: Requirements Gathering Functional & non-functional scoping, throughput & storage estimation	SLIDING WINDOW & REQUIREMENTS	☐
Day 03 Sep 21	SlidingWindowTwoPointer/02_VariableWindowLongest.cpp Variable Window (Longest): Longest Substring Without Repeating	Delivery Step 2: Core Entities & Data Model Identifying core nouns, schema modeling, relational vs NoSQL	SLIDING WINDOW & MODELING	☐
Day 04 Sep 22	SlidingWindowTwoPointer/03_VariableWindowShortest.cpp Variable Window (Shortest): Minimum Window Substring	Delivery Step 3: API & System Interface Design REST vs gRPC endpoints, idempotency keys, pagination tokens	SLIDING WINDOW & API DESIGN	☐
Day 05 Sep 23	SlidingWindowTwoPointer/04_TwoPointersOpposite.cpp Opposite Direction: Two Sum Sorted, Container Most Water	Delivery Step 4: High-Level Architecture End-to-end component flow: Clients, DNS, CDN, Gateway, DB, Cache	TWO POINTERS & ARCHITECTURE	☐
Day 06 Sep 24	SlidingWindowTwoPointer/05_TwoPointersSameDirection.cpp Same Direction: Remove Duplicates, Move Zeroes	Delivery Step 5: Deep Dives & Bottlenecks Resolving concurrency, failover, replication lag, partitioning	TWO POINTERS & DEEP DIVES	☐
Day 07 Sep 25	SlidingWindowTwoPointer/06_SlidingWindowWithMap.cpp & 07_AdvancedProblems.cpp Frequency Map Tracking & Advanced Window	Weekly Review & Framework Dry Run Practice 45-min mock delivery flow on a simple problem (e.g. TinyURL)	WEEK 1 REVIEW & MOCK	☐
Day 08 Sep 26	PrefixSum/00_PrefixSumOverview.cpp Prefix Sum Principles & Templates	Core Concept: Networking Essentials TCP vs UDP, HTTP/1.1 vs HTTP/2 vs HTTP/3, WebSockets, gRPC	PREFIX SUM & NETWORKING	☐
Day 09 Sep 27	PrefixSum/01_1DPrefixSum.cpp 1D Range Queries: Subarray Sum Equals K	Core Concept: API Design & Protocols Idempotency mechanisms, cursor pagination, RPC contracts	PREFIX SUM & API DESIGN	☐
Day 10 Sep 28	PrefixSum/02_2DPrefixSum.cpp 2D Matrix Prefix Sum: Region Sum, Maximal Square	Core Concept: Data Modeling Relational (ACID) vs Document vs KV vs Wide-Column, Normalization	2D PREFIX & DATA MODELING	☐
Day 11 Sep 29	PrefixSum/03_PrefixWithHashMap.cpp Prefix Sum with HashMap: Subarray Divisible by K	Core Concept: Database Indexing B-Tree, B+ Tree, Hash indexes, LSM-Trees, composite index ordering	PREFIX MAP & INDEXING	☐
Day 12 Sep 30	PrefixSum/04_DifferenceArray.cpp Difference Array: O(1) Range Updates	Core Concept: Caching Strategies Cache-aside, Read-through, Write-through, Write-back, LRU/LFU/TTL	DIFFERENCE ARRAY & CACHING	☐
Day 13 Oct 01	PrefixSum/05_AdvancedPrefix.cpp Advanced Prefix: Product & XOR Range Queries	Core Concept: Sharding & Partitioning Horizontal sharding, hash vs range partitioning, shard keys	PREFIX XOR & SHARDING	☐
Day 14 Oct 02	Sliding Window & Prefix Sum Consolidate Solve 2 hard LeetCode problems combining Window + Prefix	Core Concept: Consistent Hashing Hash rings, virtual nodes, minimizing key migration during rebalancing	WEEK 2 REVIEW & SCALING	☐
Day 15 Oct 03	BinarySearch/00_BinarySearchOverview.cpp Binary Search Principles & Invariant Templates	Core Concept: CAP Theorem & Consistency Strong vs Eventual consistency, PACELC, Quorum (R+W > N)	BINARY SEARCH & CAP	☐
Day 16 Oct 04	BinarySearch/01_ClassicPatterns.cpp Lower/Upper Bound, Search Insert Position	Core Concept: Numbers Every Engineer Must Know L1/L2 vs RAM vs NVMe vs Network RTT, latency hierarchy	CLASSIC BS & LATENCY MATH	☐

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Day 17 Oct 05	BinarySearch/02_RotatedArray.cpp Rotated Sorted Array: Find Min & Search	Tech Deep Dive: PostgreSQL / Relational DBs ACID, MVCC, write-ahead log, read replicas, PgBouncer pooling	ROTATED ARRAY & POSTGRESQL	☐

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Day 18 Oct 06	BinarySearch/03_SearchOnAnswer.cpp Search on Answer Domain: Koko Bananas, Ship Capacity	Tech Deep Dive: DynamoDB & Managed NoSQL Partition keys, sort keys, Global Secondary Indexes, single-digit ms	SEARCH ON ANSWER & DYNAMODB	☐
Day 19 Oct 07	BinarySearch/04_MatrixSearch.cpp 2D Matrix Search: Sorted Rows & Columns	Tech Deep Dive: Cassandra & ScyllaDB LSM-Tree write optimization, masterless ring, tunable consistency	MATRIX BS & CASSANDRA	☐
Day 20 Oct 08	BinarySearch/05_AdvancedProblems.cpp Median of Two Sorted Arrays, Split Array Largest Sum	Tech Deep Dive: Redis & Memcached In-memory data structures, Sorted Sets, Pub/Sub, Redis Cluster	ADVANCED BS & IN-MEMORY CACHE	☐
Day 21 Oct 09	Binary Search Master Review Timed set: 3 Binary search variations under 45 mins	Tech Deep Dive: Elasticsearch / OpenSearch Inverted index, BM25 scoring, Lucene segments, distributed shards	WEEK 3 REVIEW & SEARCH ENGINE	☐
Day 22 Oct 10	DataStructures/Stack/00_StackOverview.cpp Stack Fundamentals, Monotonic Stack Logic	Design Pattern: Real-Time Updates Short polling vs Long polling vs SSE vs WebSockets, connection scale	STACK & REAL-TIME UPDATES	☐
Day 23 Oct 11	DataStructures/Queue/00_QueueOverview.cpp Queue Fundamentals, Deque, BFS Applications	Design Pattern: Managing Long-Running Tasks Asynchronous job queues, worker pools, status polling, webhooks	QUEUE & LONG TASKS	☐
Day 24 Oct 12	DataStructures/LinkedList/00_LinkedListOverview.cpp LinkedList Basics, Fast/Slow Pointer, Reversal	Design Pattern: Dealing with Contention Optimistic vs Pessimistic locking, Distributed locks (Redlock)	LINKEDLIST & CONTENTION	☐
Day 25 Oct 13	DataStructures/Sortings/Merge_Sort.cpp Merge Sort: Divide & Conquer, Inversion Counting	Design Pattern: Scaling Reads Read replicas, CQRS, multi-tier caching, Edge CDNs	MERGE SORT & SCALING READS	☐
Day 26 Oct 14	DataStructures/STL/00_STLOverview.cpp C++ STL Reference: vector, map, unordered_map, priority_queue	Design Pattern: Scaling Writes WAL, batching, queue buffering, sharding, event sourcing	C++ STL & SCALING WRITES	☐
Day 27 Oct 15	DataStructures/DivideConquer/CountSmallerAfterSelf.cpp Divide & Conquer: Count Smaller Elements After Self	Design Pattern: Handling Large Blobs Presigned URLs, multipart chunked upload, resumable uploads, S3	DIVIDE & CONQUER & S3 BLOBS	☐
Day 28 Oct 16	DataStructures/NumberTheory/prime.cpp Number Theory: Sieve of Eratosthenes, Prime Factorization	Design Pattern: Multi-Step Distributed Sagas Saga Pattern: Choreography vs Orchestration, 2PC compensation	WEEK 4 REVIEW & SAGAS	☐
Day 29 Oct 17	BitManipulation/00_BitManipOverview.cpp Bitwise Cheat Sheet & Core Identities	Tech Deep Dive: Apache Kafka Distributed commit log, partitions, consumer groups, offsets	BITS & KAFKA	☐
Day 30 Oct 18	BitManipulation/01_BasicOperations.cpp Set, Clear, Toggle, Check kth Bit	Tech Deep Dive: Apache Flink Stateful stream processing, event time, sliding/tumbling windows	BIT OPS & FLINK	☐
Day 31 Oct 19	BitManipulation/02_XORTricks.cpp XOR Tricks: Single Number I/II/III, Missing Number	Tech Deep Dive: API Gateway & Load Balancers Layer 4 vs Layer 7, SSL termination, rate limit filters, routing	XOR TRICKS & API GATEWAY	☐
Day 32 Oct 20	BitManipulation/03_CountingBits.cpp Counting Bits, Power of 2, Hamming Distance	Tech Deep Dive: ZooKeeper & etcd Distributed consensus (Zab/Raft), leader election, ephemerality	HAMMING BITS & ZOOKEEPER	☐
Day 33 Oct 21	BitManipulation/04_SubsetsBitmask.cpp Subsets Generation via Bitmask Enumeration	Tech Deep Dive: Proximity Search Engines Spatial indexing: Geohash, QuadTrees, Google S2 geometry	BITMASK SUBSETS & SPATIAL INDEX	☐
Day 34 Oct 22	BitManipulation/05_BitTricks.cpp Swap, Reverse Bits, Gray Code Generation	Tech Deep Dive: Time Series Databases (TSDB) Gorilla compression, Prometheus, InfluxDB, metric downsampling	GRAY CODE & TSDB	☐

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Day 35 Oct 23	Bit Manipulation Master Review Timed bitwise challenge: Bitmask states & Bitwise DP preview	Tech Deep Dive: Big Data Probabilistic DS & Vectors Bloom filters, HyperLogLog, Count-Min sketch, Vector DBs (HNSW)	WEEK 5 REVIEW & BIG DATA	☐
Day 36 Oct 24	Backtracking/00_BacktrackingOverview.cpp Backtracking Template: Choice, Constraints, Goal	System Archetype: Bitly (URL Shortener) Base62 encoding, Hash collisions, Key-generation service, Caching	BACKTRACK FRAME & BITLY	☐
Day 37 Oct 25	Backtracking/01_SubsetsPatterns.cpp Subsets I & II (Handling Duplicates)	System Archetype: Dropbox / Google Drive Chunking, content-addressable storage, metadata DB, sync engine	SUBSETS & DROPBOX	☐
Day 38 Oct 26	Backtracking/02_Permutations.cpp Permutations I & II (Swapping vs Visited Array)	System Archetype: Yelp / Proximity Search Geohashing, QuadTree spatial index, radius search, caching	PERMUTATIONS & YELP	☐
Day 39 Oct 27	Backtracking/03_CombinationSum.cpp Combination Sum I, II, III, IV	System Archetype: Local Delivery Service (GoPuff) Order state machine, driver dispatch matching, inventory hold	COMBINATIONS & GOPUFF	☐
Day 40 Oct 28	Backtracking/04_Partitioning.cpp Palindrome Partitioning, Equal Sum Partition	System Archetype: Ticketmaster / Seat Booking High-concurrency locking, distributed transactions, virtual waiting room	PARTITIONING & TICKETMASTER	☐
Day 41 Oct 29	Backtracking/05_GridBoard.cpp Grid Board: N-Queens, Sudoku Solver, Word Search	System Archetype: FB / Twitter News Feed Fan-out on write vs Fan-out on read, hybrid model, timeline ranking	GRID BACKTRACK & NEWS FEED	☐
Day 42 Oct 30	Backtracking/06_GenerateSequences.cpp Generate Parentheses, Letter Combinations Phone	Mock System Design 1: Ticket Booking System Full 45-min whiteboard delivery with timer and self-critique	WEEK 6 REVIEW & MOCK 1	☐
Day 43 Oct 31	Trees/00_TreeOverview.cpp Binary Tree Anatomy, Recursive vs Iterative Traversals	System Archetype: Tinder (Dating Match) Geospatial candidate generation, swipe queuing, match notification	TREE BASICS & TINDER	☐
Day 44 Nov 01	Trees/01_Traversals.cpp Inorder, Preorder, Postorder, Level-Order (BFS)	System Archetype: LeetCode (Online Judge) Sandboxed Docker/gVisor runner, async judge queue, score caching	TRAVERSALS & LEETCODE	☐
Day 45 Nov 02	Trees/02_BinaryTreeBasics.cpp Max Depth, Same Tree, Invert Tree, Symmetric Tree	System Archetype: WhatsApp / Messenger WebSockets, presence service, Cassandra message store, E2EE	TREE BASICS & WHATSAPP	☐
Day 46 Nov 03	Trees/03_BST_Operations.cpp BST Insert, Delete, Search, Validate BST, Successor	System Archetype: Distributed Rate Limiter Token bucket, sliding window counter, Redis Lua atomicity	BST & RATE LIMITER	☐
Day 47 Nov 04	Trees/04_TreeConstruction.cpp Construct Tree from Inorder+Preorder/Postorder	System Archetype: YouTube / Netflix Video chunking, transcoding pipeline, adaptive bitrate streaming, CDN	TREE BUILD & YOUTUBE	☐
Day 48 Nov 05	Trees/05_LCA_Ancestors.cpp Lowest Common Ancestor (Binary Tree & BST), Kth Ancestor	System Archetype: FB Live Comments High-velocity streams, Pub/Sub fanout tree, comment sampling	LCA & LIVE COMMENTS	☐
Day 49 Nov 06	Trees/06_PathProblems.cpp & 07_TreeViews.cpp Diameter, Path Sum I/II/III, Left/Right/Top Views	System Archetype: YouTube Top K / Trending Heavy hitters, Count-Min sketch, streaming window, Redis sorted sets	PATH TREES & TOP K	☐
Day 50 Nov 07	Trees/08_TreeTransformations.cpp Flatten Binary Tree, Serialize & Deserialize Tree	System Archetype: Uber / Ride-Sharing Driver location index (QuadTree), driver-rider matching, surge pricing	SERIALIZE TREE & UBER	☐
Day 51 Nov 08	GraphTheory/00_GraphOverview.cpp Adjacency List vs Matrix, Directed vs Undirected	System Archetype: Web Crawler URL frontier, BFS politeness, Bloom filter deduplication, parsing workers	GRAPH BASICS & WEB CRAWLER	☐

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Day 52 Nov 09	GraphTheory/01_bfs.cpp BFS Traversal: Shortest Path in Unweighted Graph	Advanced System: Ad Click Aggregator Kafka streaming ingestion, Flink window aggregation, fraud detection	GRAPH BFS & AD AGGREGATOR	☐
Day 53 Nov 10	GraphTheory/02_dfs.cpp DFS Traversal: Connected Components, Cycle Detection	Advanced System: FB Post Search Real-time inverted indexing, document partition sharding, scatter-gather	GRAPH DFS & POST SEARCH	☐
Day 54 Nov 11	GraphTheory/03_union_find.cpp Disjoint Set Union (DSU): Path Compression & Rank	Advanced System: Instagram (Photo Feed) Media pipeline, user timeline cache, celebrity fan-out balance	DSU & INSTAGRAM	☐
Day 55 Nov 12	GraphTheory/04_topological_sort.cpp Topological Sort: Kahn's Algorithm & DFS Postorder	Advanced System: Strava (Fitness Tracker) GPS coordinate smoothing, geospatial segment matching, leaderboard	TOPO SORT & STRAVA	☐
Day 56 Nov 13	GraphTheory/05_dijkstra.cpp Dijkstra: Single-Source Shortest Path (Priority Queue)	Mock System Design 2: Ride-Sharing Dispatch Full 45-min whiteboard delivery with QuadTree deep dive	WEEK 8 REVIEW & MOCK 2	☐
Day 57 Nov 14	GraphTheory/06_bellman_ford.cpp Bellman-Ford: Negative Edges & Negative Cycle Detection	Advanced System: Distributed Cache Consistent hashing, replication factor, eviction, gossip cluster protocol	BELLMAN-FORD & DIST. CACHE	☐
Day 58 Nov 15	GraphTheory/07_floyd_warshall.cpp Floyd-Warshall: All-Pairs Shortest Path ($O(V^3)$)	Advanced System: Online Auction (eBay) Atomic bid placement, auction timer, real-time outbid notifications	FLOYD-WARSHALL & AUCTIONS	☐
Day 59 Nov 16	GraphTheory/08_mst.cpp Minimum Spanning Tree: Prim's & Kruskal's Algorithms	Advanced System: Job Scheduler / Distributed Cron Task queue sharding, leader election (Raft), worker heartbeats	MST & JOB SCHEDULER	☐
Day 60 Nov 17	GraphTheory/09_scc.cpp Strongly Connected Components: Tarjan's & Kosaraju's	Advanced System: News Aggregator (Google News) Web crawlers, text embeddings, document clustering, deduplication	SCC & GOOGLE NEWS	☐
Day 61 Nov 18	GraphTheory/10_articulation_bridges.cpp Cut Vertices & Bridge Detection (Tarjan's Low-Link)	Advanced System: Price Tracker (CamelCamelCamel) Scheduled scrapers, historical timeseries DB, price-drop alert rules	BRIDGES & PRICE TRACKER	☐
Day 62 Nov 19	GraphTheory/11_bipartite.cpp Bipartite Graph Check (2-Coloring via BFS/DFS)	Advanced System: Notification System Priority queueing, user preference engine, provider failover (APNs/FCM)	BIPARTITE & NOTIFICATION SYSTEM	☐
Day 63 Nov 20	Graph Theory Master Review Timed Graph set: Topological Sort + Dijkstra + DSU problem	Mock System Design 3: Distributed Job Scheduler Practice 45-min delivery with leader election & fault tolerance	WEEK 9 REVIEW & MOCK 3	☐
Day 64 Nov 21	DynamicProgramming/00_DP0overview.cpp DP Foundations: Memoization vs Tabulation, State Identification	Advanced System: Robinhood (Stock Trading) In-memory matching engine, price-time order book, audit ledger	DP FOUNDATIONS & ROBINHOOD	☐
Day 65 Nov 22	DynamicProgramming/01_Fibonacci/fibonacci_pattern.cpp Pattern 01: Fibonacci, Climbing Stairs, House Robber	Advanced System: Google Docs (Collaborative Editing) Operational Transformation (OT) vs CRDTs, WebSocket session router	FIBONACCI DP & GOOGLE DOCS	☐
Day 66 Nov 23	DynamicProgramming/02_Kadane/kadane_pattern.cpp Pattern 02: Kadane's Algorithm, Max Subarray, Max Product	Advanced System: Payment System (Stripe-like) Double-entry bookkeeping ledger, idempotency keys, 2PC gateway	KADANE DP & STRIPE LEDGER	☐
Day 67 Nov 24	DynamicProgramming/03_01Knapsack/knapsack_01.cpp Pattern 03: 0/1 Knapsack, Partition Equal Subset Sum, Target Sum	Advanced System: Metrics Monitoring (Datadog) Metrics collection agent, time-series storage, rollup downsampling	0/1 KNAPSACK & DATADOG	☐
Day 68 Nov 25	DynamicProgramming/04_UnboundedKnapsack/unbounded_knapsack.cpp Pattern 04: Unbounded Knapsack, Coin Change, Perfect Squares	Advanced System: Online Chess Game state validation, WebSocket synchronization, match clock, Elo rating	UNBOUNDED KNAPSACK & CHESS	☐

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Day 69 Nov 26	DynamicProgramming/05_LCS/longest_common_subsequence.cpp Pattern 05: Longest Common Subsequence (LCS), Edit Distance preview	Advanced System: ChatGPT / LLM Gateway Model inference router, SSE token streaming, prompt/response cache	LCS DP & CHATGPT GATEWAY	☐
Day 70 Nov 27	DynamicProgramming/06_LIS/longest_increasing_subsequence.cpp Pattern 06: Longest Increasing Subsequence (LIS $O(n \log n)$), Russian Doll	Advanced System: Flash Sale / Black Friday Pre-allocated Redis inventory decrement, queue rate levelling	WEEK 10 REVIEW & FLASH SALE	☐
Day 71 Nov 28	DynamicProgramming/07_Palindrome/palindrome_dp.cpp Pattern 07: Longest Palindromic Subsequence & Substring Count	In The Wild: Shopify Flash Sale Inventory Handling millions of checkouts without DB locking via Redis reservations	PALINDROME DP & SHOPIFY	☐
Day 72 Nov 29	DynamicProgramming/08_EditDistance/edit_distance.cpp Pattern 08: Edit Distance (Levenshtein), Wildcard & Regex Matching	In The Wild: Discord ScyllaDB Message Store Migrating trillions of messages from Cassandra to ScyllaDB without latency	EDIT DISTANCE & DISCORD	☐
Day 73 Nov 30	DynamicProgramming/09_SubsetSum/subset_sum.cpp Pattern 09: Subset Sum, Partition to K Equal Sum Subsets	In The Wild: Slack Job Queue Architecture Scaling background jobs to billions of daily executions without head-of-line blocking	SUBSET SUM & SLACK QUEUE	☐
Day 74 Dec 01	DynamicProgramming/10_StringPartition/string_partition.cpp Pattern 10: String Partitioning, Word Break I & II	In The Wild: Figma Multiplayer Engine Server-authoritative WebAssembly multiplayer synchronization without OT	WORD BREAK & FIGMA	☐
Day 75 Dec 02	DynamicProgramming/11_CatalanNumbers/catalan.cpp Pattern 11: Catalan Numbers, Unique BSTs, Valid Parentheses Count	In The Wild: Spotify Data Lake Point Queries Achieving sub-second queries on petabyte-scale data lakes with columnar indexes	CATALAN DP & SPOTIFY LAKE	☐
Day 76 Dec 03	DynamicProgramming/12_MatrixChainMultiplication/interval_dp.cpp Pattern 12: Matrix Chain Multiplication, Burst Balloons, Merge Stones	In The Wild: Meta ZGateway & ZippyDB Managing billions of cross-datacenter multi-tenant KV requests with Paxos	INTERVAL DP & META ZGATEWAY	☐
Day 77 Dec 04	DynamicProgramming/13_CountDistinctWays/count_ways.cpp & 14_DPOnGrids/grid_dp.cpp Pattern 13: Count Ways (Decode Ways) & Pattern 14: Grid DP (Unique Paths)	Mock System Design 4: Payment Gateway & Ledger 45-min mock: Idempotency, 2PC, double-entry ledger & reconciliation	WEEK 11 REVIEW & MOCK 4	☐
Day 78 Dec 05	DynamicProgramming/15_DPOnTrees/tree_dp.cpp Pattern 15: DP on Trees, House Robber III, Tree Cameras	HLD Revision: Core Storage Engines Compare PostgreSQL vs DynamoDB vs Cassandra vs Redis tradeoffs	TREE DP & STORAGE REVIEW	☐
Day 79 Dec 06	DynamicProgramming/16_DPOnGraphs/graph_dp.cpp Pattern 16: DP on Graphs, Cheapest Flights Within K Stops	HLD Revision: Message Queues & Streaming Compare Kafka vs RabbitMQ vs SQS vs Flink streaming semantics	GRAPH DP & STREAMING REVIEW	☐
Day 80 Dec 07	DynamicProgramming/17_DigitDP/digit_dp.cpp Pattern 17: Digit DP, Numbers with Unique Digits	HLD Revision: Caching & Eviction Policies Cache-aside vs write-through, multi-tier CDN, thundering herd prevention	DIGIT DP & CACHE REVIEW	☐
Day 81 Dec 08	DynamicProgramming/18_BitmaskDP/bitmask_dp.cpp Pattern 18: Bitmask DP, Traveling Salesperson (TSP), Shortest Path All Nodes	HLD Revision: High-Concurrency Contention Optimistic concurrency vs Pessimistic locking vs Redis Redlock	BITMASK DP & CONCURRENCY REVIEW	☐
Day 82 Dec 09	DynamicProgramming/19_ProbabilityDP/probability_dp.cpp & 20_StateMachineDP/state_machine_dp.cpp Pattern 19: Probability DP (Knight) & Pattern 20: State Machine (Stock Cooldown)	HLD Revision: Geospatial Systems Compare Geohashing vs QuadTrees vs Google S2 for Uber and Yelp	STATE MACHINE DP & GEO REVIEW	☐
Day 83 Dec 10	Greedy/00_GreedyOverview.cpp & 01_IntervalScheduling.cpp Greedy Proofs, Meeting Rooms, Non-overlapping Intervals	HLD Revision: Real-Time & Chat Architectures WebSockets vs SSE vs Long Polling for WhatsApp and Live Comments	INTERVAL GREEDY & REAL-TIME REVIEW	☐
Day 84 Dec 11	Greedy/02_ArraySequence.cpp & 03_StringGreedy.cpp Jump Game, Gas Station, Remove K Digits	Mock System Design 5: Collaborative Document Editor 45-min mock: Google Docs with CRDTs / OT and WebSocket routing	WEEK 12 REVIEW & MOCK 5	☐
Day 85 Dec 12	Greedy/04_HeapGreedy.cpp & 05_ClassicGreedy.cpp	HLD Rapid Recall 1: URL Shortener & Dropbox Redo Bitly & Dropbox end-to-end architectures in 20 mins each	HEAP GREEDY & FAST ARCHETYPES	☐

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	Task Scheduler, Reorganize String, Fractional Knapsack			

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Day 86 Dec 13	LineSweep/00_LineSweepOverview.cpp & 01_IntervalProblems.cpp Event Processing Template, Merge Intervals, Insert Interval	HLD Rapid Recall 2: Rate Limiter & News Feed Redo Rate Limiter & Twitter News Feed architectures under time pressure	LINE SWEEP & FAST ARCHETYPES	☐
Day 87 Dec 14	LineSweep/02_DifferenceArray.cpp & 03_SkylineProblems.cpp Range Additions, The Skyline Problem	HLD Rapid Recall 3: YouTube & Web Crawler Redo YouTube Video Pipeline & Web Crawler architectures	SKYLINE & FAST ARCHETYPES	☐
Day 88 Dec 15	LineSweep/04_CalendarProblems.cpp & 05_GeometricSweep.cpp My Calendar, Meeting Rooms II, Rectangle Overlap	HLD Rapid Recall 4: Uber & Top K Redo Uber Ride Matching & YouTube Top K streaming pipelines	CALENDAR SWEEP & FAST ARCHETYPES	☐
Day 89 Dec 16	ClassicAlgorithms/01_BoyerMooreMajority.cpp to 05_ReservoirSampling.cpp Majority Element, Dutch Flag, Floyd Cycle, QuickSelect, Reservoir Sampling	HLD Rapid Recall 5: Robinhood & Payments Redo Robinhood Stock Order Book & Stripe Payment Ledger	CLASSIC ALGOS 1 & FINTECH	☐
Day 90 Dec 17	ClassicAlgorithms/06_KMPPatternMatch.cpp to 12_RabinKarpPatternMatch.cpp KMP Match, Sieve, Fast Power, Euclidean GCD, Fisher-Yates, Morris Traversal	HLD Rapid Recall 6: ChatGPT Gateway & Flash Sale Redo ChatGPT SSE Gateway & E-Commerce Flash Sale	CLASSIC ALGOS 2 & AI SYSTEMS	☐
Day 91 Dec 18	DesignDataStructures/00_DesignOverview.cpp to 03_StackQueueDesigns.cpp Design LRU Cache, LFU Cache, Design HashMap, Min Stack	Mock System Design 6: Distributed Streaming Pipeline 45-min mock: Ad Click Aggregator with Kafka, Flink & ClickHouse	WEEK 13 REVIEW & MOCK 6	☐
Day 92 Dec 19	DesignDataStructures/04_IteratorPatterns.cpp to 07_DesignSpellChecker.cpp Peeking Iterator, Time-Based KV Store, Design Twitter, File System	HLD Tradeoff Drills: Database Selection Rapid drill: 15 scenarios, pick SQL vs NoSQL vs NewSQL with exact rationale	DESIGN DS & DB SELECTION	☐
Day 93 Dec 20	LLD/01_TicTacToe.cpp OOP Design: Tic Tac Toe Game (Entities, Board, Win Check)	HLD Tradeoff Drills: Caching & Invalidation Rapid drill: Cache penetration, cache breakdown, cache avalanche	LLD TICTACTOE & CACHING DRILLS	☐
Day 94 Dec 21	LLD/02_SnakeLadder.cpp OOP Design: Snake and Ladder (Dice, Board, Player Queue)	HLD Tradeoff Drills: Message Semantics Rapid drill: At-most-once vs At-least-once vs Exactly-once processing	LLD SNAKELADDER & MESSAGING DRILLS	☐
Day 95 Dec 22	LLD/03_EventBookingSystem.cpp OOP Design: Event Venue Booking (Seats, Show, Payment State)	HLD Tradeoff Drills: Concurrency & Locks Rapid drill: Optimistic versioning vs Redis distributed locks	LLD EVENT BOOKING & CONCURRENCY DRILLS	☐
Day 96 Dec 23	LLD/04_ParkingLot.cpp OOP Design: Parking Lot (Vehicle Types, Spots, Pricing Strategy)	Mock System Design 7: Complete End-to-End Senior SDE Full 45-min Senior SDE Mock: Surprise question with strict timer	LLD PARKING LOT & SENIOR MOCK 7	☐
Day 97 Dec 24	LLD/05_ElevatorSystem.cpp OOP Design: Elevator System (Dispatch Algorithm, States, Requests)	Behavioral & Project Deep Dive Alignment Map your past engineering projects to System Design architectural principles	LLD ELEVATOR & BEHAVIORAL PREP	☐
Day 98 Dec 25	LLD/06_Splitwise.cpp OOP Design: Splitwise Expense Sharing (User, Group, Split Strategy)	Cheat Sheet Review: Numbers Every Systems Engineer Must Know Review latency tables, throughput conversions, and capacity formulas	LLD SPLITWISE & NUMBERS REVIEW	☐
Day 99 Dec 26	LLD/07_VendingMachine.cpp & 08_Library Management.cpp OOP Design: Vending Machine (State Pattern) & Library Management	Mock System Design 8: Staff / Principal SDE System 45-min mock focusing on cross-datacenter multi-region disaster recovery	LLD FINAL & STAFF MOCK 8	☐
Day 100 Dec 27	LLD/eQ_battleship.cpp & DSA Grand Review OOP Design: Battleship Game & Final review of personal starred notes	Final System Design Interview Checklist & Mindset Review 45-min playbook, mental models, and delivery confidence	DAY 100 GRADUATION & READY!	☐