6–8 Week Roadmap: Master DSA (C++ & Python), OOPs, Advanced SQL & Dynamic Programming (Zero to Hero for Interviews)

📅 Week 1: Foundations - Arrays, Vectors, Strings, Basic SQL & OOPs Basics

Day 1–2
- *DSA (4h)*: Basics of Arrays, Time and Space Complexity, Array traversals in C++ & Python
- *OOPs (1.5h)*: What is OOP, Class & Object in C++ and Python
- *SQL (1.5h)*: Introduction to SQL, SELECT, WHERE clause

Day 3–4
- *DSA*: Array Insert/Delete, 2D Arrays, Diagonals, Practice
- *OOPs*: Constructors & Destructors, Inheritance (C++)
- *SQL*: Aggregates, GROUP BY, HAVING, ORDER BY

Day 5–6
- *DSA*: Vectors, Strings (Palindrome, Reverse), STL basics in C++ and Python
- *OOPs*: Polymorphism, Abstraction & Encapsulation
- *SQL*: JOINS, Subqueries

Day 7
- *Practice & Revision*: 10 DSA problems (Arrays/Strings), 2 small SQL queries, compare OOPs in Python vs C++

Week 2: Searching, Sorting, Recursion, File I/O, SQL Views

Day 8–9
- *DSA*: Linear & Binary Search, Bubble/Selection/Insertion Sort
- *OOPs*: Static/Class Members, Operator Overloading, Dunder methods
- *SQL*: Normalization, Keys, Constraints

Day 10–11
- *DSA*: Merge Sort, Quick Sort, practice + Recursion (Fibonacci, Factorial)
- *OOPs*: File Handling in C++ and Python
- *SQL*: Views, Transactions, Indexes

Day 12–13
- *DSA*: Backtracking – Subsets, Permutations, N-Queen
- *OOPs*: OOP Mini Project (Python or C++)
- *SQL*: ACID, Stored Procedures, Optimization Concepts

Day 14
- *Practice Day*: 10 Sorting + Recursion problems, Review all SQL joins & groupings

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🕐Week 3: Linked Lists, Stack/Queue, Intermediate SQL, Triggers

Day 15–16
- *DSA*: Singly + Doubly Linked Lists, Reversal, Insertion, Deletion
- *OOPs*: Templates, Inheritance in Python
- *SQL*: Triggers, CTEs (WITH clause)

Day 17–18
- *DSA*: Stack (Infix/Postfix), Queue, Deque using array & LL
- *OOPs*: Debugging, Trace-based learning
- *SQL*: Mini Project with SQL queries (CRUD + Joins)

Day 19–21
- *DSA*: Practice LL/Stacks/Queues (15 problems), Start mock contests
- *OOPs*: Best practices + UML diagrams
- *SQL*: Project schemas, Advanced Joins, Nested queries

🧪Week 4: Trees, Graphs, and Begin Dynamic Programming

Day 22–23
- *DSA*: Tree Basics – Inorder, Preorder, Postorder, Height, BST Insert/Delete/Search
- *OOPs*: Finalize mini project code and document it
- *SQL*: Practice ERD design + Relationships

Day 24–25
- *DSA*: Heap, Priority Queue, Graph BFS/DFS
- *OOPs*: Review all concepts for interviews
- *SQL*: Integrate SQL into project backend (Python/C++)

Day 26–28
- *Dynamic Programming Start*:
- Top-down vs Bottom-up - Memoization with recursion - Tabulation examples (Fibonacci, Factorial)

📊Week 5: Dynamic Programming Core Concepts

Day 29–31
- *DP*: 0/1 Knapsack – recursion, memoization, tabulation, optimization
- *SQL*: Practice real-case queries, stored procs, nested joins
- *OOPs*: Refactor previous mini projects using best practices

Day 32–33
- *DP*: Subset Sum, Equal Partition, Count Subsets, Target Sum
- *Mock SQL + OOPs interview prep*

Day 34–35
- *DP*: Matrix DP – Unique Paths, Coin Change, Grid Traveler

Day 36–37
- *DP*: Longest Common Subsequence (LCS), Longest Increasing Subsequence (LIS)

🕐Week 6: Advanced DP + Mock Interviews

Day 38–39
- *DP*: Edit Distance, Rod Cutting, Palindromic Substring
- *SQL*: Real-world Query Problem Solving
- *DSA*: Graph DFS + DP on Trees

Day 40–41
- *DP*: Partition DP – MCM, Boolean Parenthesization, Optimal BST
- *Mock DSA interview problems* (2 hrs daily)

Day 42
- *Revision Marathon*: DP Flashcards + Concept mind map + Problem recap

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🍓Week 7–8 (Optional Advanced Round): Consolidation + System Design

Day 43–49
- *DSA*: Mixed Topic Problem Sets (Daily contests – Trees, Graphs, DP, Arrays)
- *OOPs*: Real-world system modeling, observer/singleton patterns - *SQL*: Index tuning, performance monitoring, database design case study

Day 50–56
- *Final Mock Interviews*: Full simulations (1hr coding, 30 min OOPs, 30 min SQL)
- *Review Weak Areas*
- *Prepare Resume + GitHub Portfolio with Projects*

Deliverables:

- 2 DSA mini projects + 1 advanced DP sheet solved
- 1 OOP (Python or C++) real-world project
- 1 SQL project with live querying, joins, optimization
- Interview Q&A sheet for all three skills

Optional Add-ons:

- **Google Sheet Progress Tracker**

- **Flashcards for DP Patterns, SQL Queries, OOP concepts**
- **GitHub Portfolio for Projects**
- **Mock Interview PDFs**