

## **100 Days of DSA Challenge - Full Syllabus**

### **Phase 1: Beginner (Days 1-30)**

#### **Week 1: Python Basics & Essential Concepts**

- Day 1: Introduction to Python & Writing Your First Program
- Day 2: Variables, Data Types & Operators
- Day 3: Conditional Statements (if-else, nested conditions)
- Day 4: Loops (for, while, break, continue)
- Day 5: Functions & Basics of Recursion
- Day 6: Lists & Tuples
- Day 7: Dictionaries & Sets

#### **Week 2: Arrays & Searching Algorithms**

- Day 8: Introduction to Arrays & List Operations
- Day 9: Time Complexity Basics & Why It Matters
- Day 10: Linear Search Algorithm
- Day 11: Binary Search Algorithm & Variants
- Day 12: Two Pointers Technique
- Day 13: Sliding Window Technique
- Day 14: Prefix Sum & Kadane's Algorithm

#### **Week 3: Sorting & Linked Lists**

- Day 15: Bubble Sort, Selection Sort
- Day 16: Insertion Sort, Merge Sort
- Day 17: Quick Sort, Counting Sort
- Day 18: Introduction to Linked Lists
- Day 19: Singly Linked List Operations
- Day 20: Doubly Linked List & Circular Linked List
- Day 21: Practice Problems on Sorting & Linked Lists

#### **Week 4: Stacks & Queues**

- Day 22: Introduction to Stacks (LIFO, Applications)
- Day 23: Stack Implementation using Lists & Linked Lists
- Day 24: Introduction to Queues (FIFO, Applications)
- Day 25: Queue Implementation using Lists & Linked Lists
- Day 26: Deque & Priority Queue
- Day 27: Stack & Queue Interview Questions

- Day 28: Mini Project - Implement LRU Cache
  - Day 29: Recap & Additional Practice Problems
  - Day 30: Mock Interview (Beginner-Level)
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## **Phase 2: Intermediate (Days 31-70)**

### **Week 5: Recursion & Backtracking**

- Day 31: Deep Dive into Recursion
- Day 32: Backtracking Basics
- Day 33: N-Queens Problem
- Day 34: Sudoku Solver
- Day 35: Subset & Permutation Problems
- Day 36: Word Search Problem
- Day 37: Practice Problems on Recursion & Backtracking

### **Week 6: Trees & Binary Search Trees (BSTs)**

- Day 38: Introduction to Trees
- Day 39: Binary Trees (Traversal Techniques)
- Day 40: Depth-First Search (DFS)
- Day 41: Breadth-First Search (BFS)
- Day 42: Lowest Common Ancestor (LCA) Problem
- Day 43: Introduction to BSTs
- Day 44: Practice Problems on Trees & BSTs

### **Week 7: Heaps & Hashing**

- Day 45: Min-Heap & Max-Heap Implementation
- Day 46: Heap Sort Algorithm
- Day 47: Introduction to Hashing & HashTables
- Day 48: HashMaps & Collision Handling
- Day 49: Implementing a HashMap from Scratch
- Day 50: Practice Problems on Heaps & Hashing
- Day 51: Mid-Challenge Mock Interview

### **Week 8: Graphs & Algorithms**

- Day 52: Introduction to Graphs
- Day 53: Graph Representation (Adjacency List & Matrix)
- Day 54: BFS & DFS Traversal

- Day 55: Dijkstra's Algorithm (Shortest Path)
- Day 56: Bellman-Ford & Floyd-Warshall Algorithm
- Day 57: Prim's & Kruskal's Algorithm (MST)
- Day 58: Practice Problems on Graphs

### **Week 9-10: Dynamic Programming (DP) Basics & Advanced**

- Day 59-65: DP Basics (Memoization, Tabulation, Common Problems)
  - Day 66-70: Advanced DP Problems & Mock Interview
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## **Phase 3: Advanced (Days 71-100)**

### **Week 11: Advanced Data Structures**

- Day 71-77: Tries, Segment Trees, Fenwick Trees & Range Queries

### **Week 12: Greedy Algorithms & Bit Manipulation**

- Day 78-84: Greedy Strategies, Huffman Coding, Bitwise Tricks

### **Week 13: System Design Basics**

- Day 85-90: Scalability, Load Balancing, Case Studies

### **Week 14: Company-Specific Problems & Optimization**

- Day 91-100: MAANG Interview Problems, Optimization, Final Mock Interview