DSA Pattern Question Bank

Top 10 Problems for Each Pattern to Master DSA

Pattern 1: Sliding Window

Goal: Master variable-sized and fixed-sized windows.

1. ☑ **Maximum Sum Subarray of Size K** (Easy) - LeetCode N/A (Basic concept)
2. ☑ **Smallest Subarray with a given sum** (Easy) - LeetCode N/A
3. ☑ **Longest Substring with K Distinct Characters** (Medium) - LeetCode 340
4. ☑ **Fruits into Baskets** (Medium) - LeetCode 904
5. ☑ **Longest Substring Without Repeating Characters** (Medium) - LeetCode 3
6. ☑ **Longest Repeating Character Replacement** (Medium) - LeetCode 424
7. ☑ **Permutation in String** (Medium) - LeetCode 567
8. ☑ **Find All Anagrams in a String** (Medium) - LeetCode 438
9. ☑ **Minimum Window Substring** (Hard) - LeetCode 76
10. ☑ **Substring with Concatenation of All Words** (Hard) - LeetCode 30

Pattern 2: Two Pointers

Goal: Master pointer manipulation in sorted and unsorted arrays.

1. ☑ **Pair with Target Sum** (Easy) - LeetCode 1 (Two Sum variant)
2. ☑ **Remove Duplicates from Sorted Array** (Easy) - LeetCode 26
3. ☑ **Squaring a Sorted Array** (Easy) - LeetCode 977
4. ☑ **Triplet Sum to Zero** (Medium) - LeetCode 15 (3Sum)
5. ☑ **Triplet Sum Close to Target** (Medium) - LeetCode 16
6. ☑ **Triplets with Smaller Sum** (Medium) - LeetCode 259
7. ☑ **Subarrays with Product Less than Target** (Medium) - LeetCode 713
8. ☑ **Dutch National Flag Problem** (Medium) - LeetCode 75 (Sort Colors)
9. ☑ **4Sum** (Medium) - LeetCode 18
10. ☑ **Backspace String Compare** (Easy) - LeetCode 844

Pattern 3: Fast & Slow Pointers

Goal: Master cycle detection and middle element finding.

1. ☑ **LinkedList Cycle** (Easy) - LeetCode 141
2. ☑ **Start of LinkedList Cycle** (Medium) - LeetCode 142
3. ☑ **Happy Number** (Easy) - LeetCode 202
4. ☑ **Middle of the LinkedList** (Easy) - LeetCode 876
5. ☑ **Palindrome LinkedList** (Easy) - LeetCode 234
6. ☑ **Reorder List** (Medium) - LeetCode 143
7. ☑ **Circular Array Loop** (Medium) - LeetCode 457
8. ☑ **Find the Duplicate Number** (Medium) - LeetCode 287
9. ☑ **Linked List Cycle II** (Medium) - LeetCode 142
10. ☑ **Intersection of Two Linked Lists** (Easy) - LeetCode 160

Pattern 4: Merge Intervals

Goal: Master interval manipulation and overlapping logic.

1. ☑ **Merge Intervals** (Medium) - LeetCode 56
2. ☑ **Insert Interval** (Medium) - LeetCode 57
3. ☑ **Intervals Intersection** (Medium) - LeetCode 986
4. ☑ **Conflicting Appointments** (Easy) - LeetCode N/A
5. ☑ **Meeting Rooms** (Easy) - LeetCode 252
6. ☑ **Meeting Rooms II** (Medium) - LeetCode 253
7. ☑ **Minimum Meeting Rooms** (Medium) - Same as 253
8. ☑ **Employee Free Time** (Hard) - LeetCode 759
9. ☑ **Non-overlapping Intervals** (Medium) - LeetCode 435
10. ☑ **Minimum Number of Arrows to Burst Balloons** (Medium) - LeetCode 452

Pattern 5: Cyclic Sort

Goal: Master in-place sorting for range-based arrays.

1. ☑ **Cyclic Sort** (Easy) - LeetCode N/A (Concept)
2. ☑ **Find the Missing Number** (Easy) - LeetCode 268
3. ☑ **Find All Missing Numbers** (Easy) - LeetCode 448
4. ☑ **Find the Duplicate Number** (Medium) - LeetCode 287
5. ☑ **Find all Duplicates** (Medium) - LeetCode 442
6. ☑ **Find the Corrupt Pair** (Easy) - LeetCode 645
7. ☑ **First Missing Positive** (Hard) - LeetCode 41
8. ☑ **Find the Smallest Missing Positive Number** (Medium) - Same as 41
9. ☑ **Set Mismatch** (Easy) - LeetCode 645
10. ☑ **Missing Element in Sorted Array** (Medium) - LeetCode 1060

Pattern 6: In-place Reversal of LinkedList

Goal: Master pointer manipulation for reversing linked lists.

1. ☑ **Reverse a LinkedList** (Easy) - LeetCode 206
2. ☑ **Reverse a Sub-list** (Medium) - LeetCode 92
3. ☑ **Reverse Every K-element Sub-list** (Hard) - LeetCode 25
4. ☑ **Reverse Alternating K-element Sub-list** (Medium) - LeetCode N/A
5. ☑ **Rotate List** (Medium) - LeetCode 61
6. ☑ **Swap Nodes in Pairs** (Medium) - LeetCode 24
7. ☑ **Reverse Nodes in k-Group** (Hard) - LeetCode 25
8. ☑ **Reverse Linked List II** (Medium) - LeetCode 92
9. ☑ **Palindrome Linked List** (Easy) - LeetCode 234

10. ☑ **Remove Nth Node From End** (Medium) - LeetCode 19

Pattern 7: Tree Breadth First Search (BFS)

Goal: Master level-order traversal using Queue.

1. ☑ **Binary Tree Level Order Traversal** (Medium) - LeetCode 102
2. ☑ **Reverse Level Order Traversal** (Medium) - LeetCode 107
3. ☑ **Zigzag Traversal** (Medium) - LeetCode 103
4. ☑ **Level Averages in a Binary Tree** (Easy) - LeetCode 637
5. ☑ **Minimum Depth of Binary Tree** (Easy) - LeetCode 111
6. ☑ **Connect Level Order Siblings** (Medium) - LeetCode 116/117
7. ☑ **Populating Next Right Pointers** (Medium) - LeetCode 116
8. ☑ **Binary Tree Right Side View** (Medium) - LeetCode 199
9. ☑ **Level Order Successor** (Easy) - LeetCode N/A
10. ☑ **Maximum Depth of Binary Tree** (Easy) - LeetCode 104

Pattern 8: Tree Depth First Search (DFS)

Goal: Master recursive tree traversal.

1. ☑ **Binary Tree Path Sum** (Easy) - LeetCode 112
2. ☑ **Path Sum II (All Paths)** (Medium) - LeetCode 113
3. ☑ **Sum of Path Numbers** (Medium) - LeetCode 129
4. ☑ **Path With Given Sequence** (Medium) - LeetCode N/A
5. ☑ **Count Paths for a Sum** (Medium) - LeetCode 437
6. ☑ **Diameter of Binary Tree** (Easy) - LeetCode 543
7. ☑ **Maximum Path Sum** (Hard) - LeetCode 124
8. ☑ **Lowest Common Ancestor** (Medium) - LeetCode 236
9. ☑ **Validate Binary Search Tree** (Medium) - LeetCode 98
10. ☑ **Invert Binary Tree** (Easy) - LeetCode 226

Pattern 9: Two Heaps

Goal: Master median finding and streaming data.

1. ☑ **Find Median from Data Stream** (Hard) - LeetCode 295
2. ☑ **Sliding Window Median** (Hard) - LeetCode 480
3. ☑ **Maximize Capital (IPO)** (Hard) - LeetCode 502
4. ☑ **Find Right Interval** (Medium) - LeetCode 436
5. ☑ **Kth Largest Element in a Stream** (Easy) - LeetCode 703
6. ☑ **Top K Frequent Elements** (Medium) - LeetCode 347
7. ☑ **K Closest Points to Origin** (Medium) - LeetCode 973
8. ☑ **Reorganize String** (Medium) - LeetCode 767
9. ☑ **Rearrange String k Distance Apart** (Hard) - LeetCode 358
10. ☑ **Task Scheduler** (Medium) - LeetCode 621

Pattern 10: Subsets (Backtracking)

Goal: Master generating combinations and permutations.

1. ☑ **Subsets** (Medium) - LeetCode 78
2. ☑ **Subsets II (with duplicates)** (Medium) - LeetCode 90
3. ☑ **Permutations** (Medium) - LeetCode 46
4. ☑ **Permutations II** (Medium) - LeetCode 47
5. ☑ **Combinations** (Medium) - LeetCode 77
6. ☑ **Combination Sum** (Medium) - LeetCode 39
7. ☑ **Combination Sum II** (Medium) - LeetCode 40
8. ☑ **Letter Case Permutation** (Medium) - LeetCode 784
9. ☑ **Generate Parentheses** (Medium) - LeetCode 22
10. ☑ **Palindrome Partitioning** (Medium) - LeetCode 131

Pattern 11: Modified Binary Search

Goal: Master search in rotated/modified sorted arrays.

1. ☑ **Binary Search** (Easy) - LeetCode 704
2. ☑ **Ceiling of a Number** (Medium) - LeetCode N/A
3. ☑ **Next Letter** (Medium) - LeetCode 744
4. ☑ **Number Range** (Medium) - LeetCode 34
5. ☑ **Search in a Sorted Infinite Array** (Medium) - LeetCode 702
6. ☑ **Minimum Difference Element** (Medium) - LeetCode N/A
7. ☑ **Bitonic Array Maximum** (Easy) - LeetCode 852
8. ☑ **Search in Rotated Sorted Array** (Medium) - LeetCode 33
9. ☑ **Search in Rotated Sorted Array II** (Medium) - LeetCode 81
10. ☑ **Find Peak Element** (Medium) - LeetCode 162

Pattern 12: Bitwise XOR

Goal: Master bit manipulation for unique numbers.

1. ☑ **Single Number** (Easy) - LeetCode 136
2. ☑ **Single Number II** (Medium) - LeetCode 137
3. ☑ **Single Number III** (Medium) - LeetCode 260
4. ☑ **Complement of Base 10 Number** (Easy) - LeetCode 1009
5. ☑ **Number of 1 Bits** (Easy) - LeetCode 191
6. ☑ **Power of Two** (Easy) - LeetCode 231
7. ☑ **Missing Number** (Easy) - LeetCode 268
8. ☑ **Reverse Bits** (Easy) - LeetCode 190
9. ☑ **Flip Image** (Easy) - LeetCode 832
10. ☑ **Find the Difference** (Easy) - LeetCode 389

Pattern 13: Top 'K' Elements

Goal: Master heap operations for finding top K.

1. ☑ **Kth Largest Element** (Medium) - LeetCode 215
2. ☑ **Kth Smallest Element** (Medium) - LeetCode 215 (variant)
3. ☑ **K Closest Points to Origin** (Medium) - LeetCode 973
4. ☑ **Top K Frequent Elements** (Medium) - LeetCode 347
5. ☑ **Frequency Sort** (Medium) - LeetCode 451
6. ☑ **Kth Largest Element in a Stream** (Easy) - LeetCode 703
7. ☑ **Connect Ropes (Minimum Cost)** (Easy) - LeetCode 1167
8. ☑ **Top K Frequent Words** (Medium) - LeetCode 692
9. ☑ **K Closest Numbers** (Medium) - LeetCode 658
10. ☑ **Reorganize String** (Medium) - LeetCode 767

Pattern 14: K-way Merge

Goal: Master merging multiple sorted structures.

1. ☑ **Merge K Sorted Lists** (Hard) - LeetCode 23
2. ☑ **Kth Smallest Element in Sorted Matrix** (Medium) - LeetCode 378
3. ☑ **Smallest Number Range** (Hard) - LeetCode 632
4. ☑ **Find K Pairs with Smallest Sums** (Medium) - LeetCode 373
5. ☑ **Merge Sorted Array** (Easy) - LeetCode 88
6. ☑ **Merge Two Sorted Lists** (Easy) - LeetCode 21
7. ☑ **Kth Smallest in M Sorted Lists** (Medium) - LeetCode N/A
8. ☑ **Median of Two Sorted Arrays** (Hard) - LeetCode 4
9. ☑ **Diagonal Traverse II** (Medium) - LeetCode 1424
10. ☑ **Sort List** (Medium) - LeetCode 148

Pattern 15: 0/1 Knapsack (Dynamic Programming)

Goal: Master optimization problems with constraints.

1. ☑ **0/1 Knapsack** (Medium) - LeetCode N/A (Classic problem)
2. ☑ **Equal Subset Sum Partition** (Medium) - LeetCode 416
3. ☑ **Subset Sum** (Medium) - LeetCode N/A
4. ☑ **Minimum Subset Sum Difference** (Hard) - LeetCode 1049
5. ☑ **Count of Subset Sum** (Medium) - LeetCode N/A
6. ☑ **Target Sum** (Medium) - LeetCode 494
7. ☑ **Partition Equal Subset Sum** (Medium) - LeetCode 416
8. ☑ **Last Stone Weight II** (Medium) - LeetCode 1049
9. ☑ **Coin Change** (Medium) - LeetCode 322
10. ☑ **Coin Change 2** (Medium) - LeetCode 518

Pattern 16: Topological Sort (Graph)

Goal: Master dependency ordering in DAGs.

1. ☑ **Course Schedule** (Medium) - LeetCode 207
2. ☑ **Course Schedule II** (Medium) - LeetCode 210
3. ☑ **Minimum Height Trees** (Medium) - LeetCode 310
4. ☑ **Alien Dictionary** (Hard) - LeetCode 269
5. ☑ **Sequence Reconstruction** (Medium) - LeetCode 444
6. ☑ **All Ancestors of a Node** (Medium) - LeetCode 2192
7. ☑ **Parallel Courses** (Medium) - LeetCode 1136
8. ☑ **Find All Recipes** (Medium) - LeetCode 2115
9. ☑ **Sort Items by Groups** (Hard) - LeetCode 1203
10. ☑ **Build Array Where You Can Find Max** (Medium) - LeetCode 1389

Pattern 17: Union Find (Disjoint Set)

Goal: Master connected components and cycle detection.

1. ☑ **Number of Provinces** (Medium) - LeetCode 547
2. ☑ **Redundant Connection** (Medium) - LeetCode 684
3. ☑ **Most Stones Removed** (Medium) - LeetCode 947
4. ☑ **Accounts Merge** (Medium) - LeetCode 721
5. ☑ **Number of Connected Components** (Medium) - LeetCode 323
6. ☑ **Graph Valid Tree** (Medium) - LeetCode 261
7. ☑ **Smallest String with Swaps** (Medium) - LeetCode 1202
8. ☑ **Satisfiability of Equality Equations** (Medium) - LeetCode 990
9. ☑ **Regions Cut by Slashes** (Medium) - LeetCode 959
10. ☑ **Number of Islands II** (Hard) - LeetCode 305

Pattern 18: Monotonic Stack

Goal: Master finding next greater/smaller elements.

1. ☑ **Next Greater Element I** (Easy) - LeetCode 496
2. ☑ **Next Greater Element II** (Medium) - LeetCode 503
3. ☑ **Daily Temperatures** (Medium) - LeetCode 739
4. ☑ **Online Stock Span** (Medium) - LeetCode 901
5. ☑ **Largest Rectangle in Histogram** (Hard) - LeetCode 84
6. ☑ **Maximal Rectangle** (Hard) - LeetCode 85
7. ☑ **Trapping Rain Water** (Hard) - LeetCode 42
8. ☑ **Sum of Subarray Minimums** (Medium) - LeetCode 907
9. ☑ **Remove K Digits** (Medium) - LeetCode 402
10. ☑ **132 Pattern** (Medium) - LeetCode 456

Pattern 19: Trie (Prefix Tree)

Goal: Master string prefix operations.

1. ☑ **Implement Trie** (Medium) - LeetCode 208
2. ☑ **Design Add and Search Words** (Medium) - LeetCode 211
3. ☑ **Word Search II** (Hard) - LeetCode 212
4. ☑ **Replace Words** (Medium) - LeetCode 648
5. ☑ **Longest Word in Dictionary** (Medium) - LeetCode 720
6. ☑ **Implement Magic Dictionary** (Medium) - LeetCode 676
7. ☑ **Stream of Characters** (Hard) - LeetCode 1032
8. ☑ **Search Suggestions System** (Medium) - LeetCode 1268
9. ☑ **Palindrome Pairs** (Hard) - LeetCode 336
10. ☑ **Lexicographical Numbers** (Medium) - LeetCode 386

Pattern 20: Matrix Traversal (Islands)

Goal: Master DFS/BFS on 2D grids.

1. ☑ **Number of Islands** (Medium) - LeetCode 200
2. ☑ **Max Area of Island** (Medium) - LeetCode 695
3. ☑ **Flood Fill** (Easy) - LeetCode 733
4. ☑ **Rotting Oranges** (Medium) - LeetCode 994
5. ☑ **Word Search** (Medium) - LeetCode 79
6. ☑ **Surrounded Regions** (Medium) - LeetCode 130
7. ☑ **Pacific Atlantic Water Flow** (Medium) - LeetCode 417
8. ☑ **Shortest Path in Binary Matrix** (Medium) - LeetCode 1091
9. ☑ **As Far from Land as Possible** (Medium) - LeetCode 1162
10. ☑ **Count Sub Islands** (Medium) - LeetCode 1905

How to Use This Question Bank

1. **Master One Pattern at a Time:** Don't jump around. Finish all 10 problems for Pattern 1 before moving to Pattern 2.
2. **Use the 30-Minute Rule:** Spend max 30 minutes on a problem. If stuck, look at the solution.
3. **Revisit:** After solving all 10, revisit them after 3 days, then 1 week.
4. **Track Progress:** Use the checkboxes (☑) to mark completed problems.

Total Problems: 200 problems covering all 20 patterns.