Module 5 of Skill Path: Ace the Java Coding Interview

Coding Interview Patterns

Module Overview

This module teaches us the underlying patterns behind common coding interview questions. By learning these essential patterns, we'll be able to assess the problem statement and unpack and answer any problem the right way. This approach was created by FAANG's hiring managers to help us prepare for the typical rounds of interviews at major tech companies like Apple, Google, Meta, Microsoft, and Amazon.

By the end of this module, we'll have the skills we need to unlock even the most challenging questions, grok the coding interview, and level up our career with confidence.

Module Objectives

- Understand the essential patterns behind common coding interview questions without having to go through endless problem sets.
- Identify the underlying pattern of each interview question by assessing the problem statement (and learn the tricks required to solve it).
- Practice your skills in a hands-on, setup-free coding environment.
- Learn to efficiently evaluate the tradeoffs between time and space complexity in different solutions.
- Develop a flexible conceptual framework for solving any question by connecting problem characteristics, solution techniques, and coding design patterns.

63% completed

Continue Learning

Module 4 Content (Module 5) Module 6

1. Sliding Window

- Sliding Window: Introduction
- Repeated DNA Sequences
- Solution: Repeated DNA Sequences
- Find Maximum in Sliding Window
- Solution: Find Maximum in Sliding Window
- Minimum Window Subsequence
- Solution: Minimum Window Subsequence
- Longest Repeating Character Replacement
- Solution: Longest Repeating Character Replacement
- Minimum Window Substring
- Solution: Minimum Window Substring
- Longest Substring without Repeating Characters
- Solution: Longest Substring without Repeating Characters
- Minimum Size Subarray Sum
- Solution: Minimum Size Subarray Sum
- Best Time to Buy and Sell Stock

2. Two Pointers

- Two Pointers: Introduction
- Valid Palindrome

Solution: Valid Palindrome

Sum of Three Values

Solution: Sum of Three Values

- Remove nth Node from End of List

Solution: Remove nth Node from End of List

- Sort Colors
- Solution: Sort Colors

Reverse Words in a String

Solution: Reverse Words in a String

Valid Palindrome II

3. Fast and Slow Pointer

Fast and Slow Pointers: Introduction

Happy Number

Solution: Happy Number

Linked List Cycle

Solution: Linked List Cycle

Middle of the Linked List

Solution: Middle of the Linked List

Circular Array Loop

Solution: Circular Array Loop

- Find The Duplicate Number
- Solution: Find The Duplicate Number

Palindrome Linked List

Solution: Palindrome Linked List

4. Merge Intervals

- Merge Intervals: Introduction
- Merge Intervals
- Solution: Merge Intervals
- Insert Interval
- Solution: Insert Interval
- Interval List Intersections
- Solution: Interval List Intersections
- Employee Free Time
- Solution: Employee Free Time
- Task Scheduler
- Solution: Task Scheduler
- Meeting Rooms II

5. In-place Reversal of a Linked List

- In-place Reversal of a Linked List: Introduction
- Reverse Linked List
- Solution: Reverse Linked List
- Reverse Nodes in k-Group
- Solution: Reverse Nodes in k-Group
- Reverse Linked List II
- Solution: Reverse Linked List II
- Reorder List
- Solution: Reorder List
- Swapping Nodes in a Linked List

Solution: Swapping Nodes in a Linked List

Reverse Nodes In Even Length Groups

Solution: Reverse Nodes in Even Length Groups

Swap Nodes in Pairs

6. Two Heaps

Two Heaps: Introduction

Maximize Capital

Solution: Maximize Capital

Sliding Window Median

Solution: Sliding Window Median

Find Median from a Data Stream

Solution: Find Median from a Data Stream

Schedule Tasks on Minimum Machines

Solution: Schedule Tasks on Minimum Machines

7. K-way merge

K-way Merge: Introduction

Merge Sorted Array

Solution: Merge Sorted Array

Kth Smallest Number in M Sorted Lists

Solution: Kth Smallest Number in M Sorted Lists

Find K Pairs with Smallest Sums

Solution: Find K Pairs with Smallest Sums

Merge K Sorted Lists

Solution: Merge K Sorted Lists

Kth Smallest Element in a Sorted Matrix

Solution: Kth Smallest Element in a Sorted Matrix

8. Top K Elements

Top K Elements: Introduction

Kth Largest Element in a Stream

Solution: Kth Largest Element in a Stream

Reorganize String

Solution: Reorganize String

K Closest Points to Origin

Solution: K Closest Points to Origin

Top K Frequent Elements

Solution: Top K Frequent Elements

Kth Largest Element in an Array

Solution: Kth Largest Element in an Array

Top K Frequent Words

9. Modified Binary Search

Modified Binary Search: Introduction

Binary Search

Solution: Binary Search

Search in Rotated Sorted Array

Solution: Search in Rotated Sorted Array

First Bad Version

Solution: First Bad Version

Random Pick with Weight

Solution: Random Pick with Weight

Find K Closest Elements

Solution: Find K Closest Elements

Single Element in a Sorted Array

Solution: Single Element in a Sorted Array

Search in Rotated Sorted Array II

10. Subsets

Subsets: Introduction

Subsets

Solution: Subsets

Permutations

Solution: Permutations

Letter Combinations of a Phone Number

Solution: Letter Combinations of a Phone Number

Generate Parentheses

Solution: Generate Parentheses

Find K-Sum Subsets

11. Greedy Techniques

Greedy Techniques: Introduction

Jump Game I

Solution: Jump Game I

Boats to Save People

Solution: Boats to Save People

Gas Stations

Solution: Gas Stations

Two City Scheduling

Solution: Two City Scheduling

Minimum Number of Refueling Stops

Solution: Minimum Number of Refueling Stops

Jump Game II

12. Backtracking

Backtracking: Introduction

N-Queens

Solution: N-Queens

Word Search

Solution: Word Search

House Robber III

Solution: House Robber III

Restore IP Addresses

Solution: Restore IP Addresses

Flood Fill

Solution: Flood Fill

Sudoku Solver

Matchsticks to Square

13. Dynamic Programming

Dynamic Programming: Introduction

0/1 Knapsack

Solution: 0/1 Knapsack

Coin Change

Solution: Coin Change

N-th Tribonacci Number

Solution: N-th Tribonacci Number

Partition Equal Subset Sum

Solution: Partition Equal Subset Sum

Counting Bits

Solution: Counting Bits

01 Matrix

Solution: 01 Matrix

House Robber II

Solution: House Robber II

Maximum Product Subarray

Solution: Maximum Product Subarray

Combination Sum

Solution: Combination Sum

Word Break

Solution: Word Break

Palindromic Substrings

Solution: Palindromic Substrings

Longest Common Subsequence

Solution: Longest Common Subsequence

Word Break II

Solution: Word Break II

Decode Ways

Solution: Decode Ways

Climbing Stairs

14. Cyclic Sort

- Cyclic Sort: Introduction
- Missing Number
- Solution: Missing Number
- First Missing Positive
- Solution: First Missing Positive
- Find The Duplicate Number
- Solution: Find The Duplicate Number
- Find the Corrupt Pair
- Solution: Find the Corrupt Pair
- Find the First K Missing Positive Numbers

15. Topological Sort

- Topological Sort: Introduction
- Compilation Order
- Solution: Compilation Order
- Alien Dictionary
- Solution: Alien Dictionary
- Verifying an Alien Dictionary

- Solution: Verifying an Alien Dictionary
- Course Schedule II
- Solution: Course Schedule II
- Course Schedule
- Solution: Course Schedule
- Find All Possible Recipes from Given Supplies

16. Matrices

- Matrices: Introduction
- Set Matrix Zeros
- Solution: Set Matrix Zeros
- Rotate Image
- Solution: Rotate Image
- Spiral Matrix
- Solution: Spiral Matrix
- Where Will the Ball Fall
- Solution: Where Will the Ball Fall

17. Stacks

- Stacks: Introduction
- Basic Calculator
- Solution: Basic Calculator
- Remove All Adjacent Duplicates In String
- Solution: Remove All Adjacent Duplicates In String
- Minimum Remove to Make Valid Parentheses

Solution: Minimum Remove to Make Valid Parentheses

Exclusive Execution Time of Functions

Solution: Exclusive Execution Time of Functions

Flatten Nested List Iterator

Solution: Flatten Nested List Iterator

Implement Queue Using Stacks

Solution: Implement Queue Using Stacks

Valid Parentheses

18. Graphs

Graphs: Introduction

Network Delay Time

Solution: Network Delay Time

Paths in Maze That Lead to Same Room

Solution: Paths in Maze That Lead to Same Room

Clone Graph

Solution: Clone Graph

Graph Valid Tree

Solution: Graph Valid Tree

Bus Routes

Solution: Bus Routes

19. Tree Depth First Search

Tree Depth-first Search: Introduction

Flatten Binary Tree to Linked List

Solution: Flatten Binary Tree to Linked List

Diameter of Binary Tree

Solution: Diameter of Binary Tree

Serialize and Deserialize Binary Tree

Solution: Serialize and Deserialize Binary Tree

Invert Binary Tree

Solution: Invert Binary Tree

Binary Tree Maximum Path Sum

Solution: Binary Tree Maximum Path Sum

Convert Sorted Array to Binary Search Tree

Solution: Convert Sorted Array to Binary Search Tree

Solution: Build Binary Tree from Preorder and Inorder Traversal

Build Binary Tree from Preorder and Inorder Traversal

Binary Tree Right Side View

Solution: Binary Tree Right Side View

Lowest Common Ancestor in a Binary Tree

Solution: Lowest Common Ancestor in a Binary Tree

Validate Binary Search Tree

Solution: Validate Binary Search Tree

Maximum Depth of Binary Tree

Kth Smallest Element in a BST

20. Tree Breadth First Search

Tree Breadth-first Search: Introduction

Level Order Traversal of Binary Tree

Solution: Level Order Traversal of Binary Tree

Binary Tree Zigzag Level Order Traversal

Solution: Binary Tree Zigzag Level Order Traversal

Populating Next Right Pointers in Each Node

Solution: Populating Next Right Pointers in Each Node

Vertical Order Traversal of a Binary Tree

Solution: Vertical Order Traversal of a Binary Tree

Symmetric Tree

Solution: Symmetric Tree

Word Ladder

Solution: Word Ladder

Connect All Siblings of a Binary Tree

21. Trie

Trie: Introduction

- ◯ Implement Trie
- ◯ Solution: Implement Trie
- ◯ Search Suggestions System
- ◯ Solution: Search Suggestions System
- ◯ Replace Words
- ◯ Solution: Replace Words
- ◯ Design Add and Search Words Data Structure
- ◯ Solution: Design Add and Search Words Data Structure
- ◯ Word Search II
- ◯ Solution: Word Search II
- ◯ Lexicographical Numbers

22. Hash Maps

- Hash Maps: Introduction
- Design HashMap
- Solution: Design HashMap
- Fraction to Recurring Decimal
- Solution: Fraction to Recurring Decimal
- Logger Rate Limiter
- Solution: Logger Rate Limiter
- Next Greater Element
- Solution: Next Greater Element
- Isomorphic Strings
- Solution: Isomorphic Strings
- Longest Palindrome

23. Knowing What to Track

- Knowing What to Track: Introduction
- Palindrome Permutation
- Solution: Palindrome Permutation
- Valid Anagram
- Solution: Valid Anagram
- Design Tic-Tac-Toe
- Solution: Design Tic-Tac-Toe
- Group Anagrams
- Solution: Group Anagrams
- Maximum Frequency Stack

- Solution: Maximum Frequency Stack
- First Unique Character in a String
- Solution: First Unique Character in a String
- Find All Anagrams in a String
- Solution: Find All Anagrams in a String
- Longest Palindrome by Concatenating Two-Letter Words
- Solution: Longest Palindrome by Concatenating Two-Letter Words
- Ransom Note

24. Union Find

- Union Find: Introduction
- Redundant Connection
- Solution: Redundant Connection
- Number of Islands
- Solution: Number of Islands
- Most Stones Removed with Same Row or Column
- Solution: Most Stones Removed with Same Row or Column
- Longest Consecutive Sequence
- Solution: Longest Consecutive Sequence
- Last Day Where You Can Still Cross
- Solution: Last Day Where You Can Still Cross
- Regions Cut by Slashes
- Solution: Regions Cut by Slashes
- Minimize Malware Spread
- Solution: Minimize Malware Spread
- Accounts Merge

- Solution: Accounts Merge
- Minimize Malware Spread
- Solution: Minimize Malware Spread
- Evaluate Division

25. Custom Data Structures

- Custom Data Structures: Introduction
- Snapshot Array
- Solution: Snapshot Array
- Time-Based Key-Value Store
- Solution: Time-Based Key-Value Store
- Implement LRU Cache
- Solution: Implement LRU Cache
- Insert Delete GetRandom O(1)
- Solution: Insert Delete GetRandom O(1)
- Min Stack
- Solution: Min Stack
- LFU Cache

26. Bitwise Manipulation

- Bitwise Manipulation: Introduction
- Find the Difference
- Solution: Find the Difference
- Complement of Base 10 Number
- Solution: Complement of Base 10 Number

- Flipping an Image
- Solution: Flipping an Image
- Single Number
- Solution: Single Number
- Two Single Numbers
- Solution: Two Single Numbers
- Encode and Decode Strings
- Solution: Encode and Decode Strings
- Reverse Bits

27. Challenge Yourself

- Challenge Yourself: Introduction
- Shortest Bridge
- Number of Connected Components in an Undirected Graph
- Median of Two Sorted Arrays
- Pacific Atlantic Water Flow
- Contains Duplicate
- Two Sum
- Find Minimum in Rotated Sorted Array
- Non-overlapping Intervals
- Meeting Rooms
- Largest Rectangle in Histogram
- Subtree of Another Tree
- Sort List
- Number of 1 Bits
- Container With the Most Water

- Evaluate Reverse Polish Notation
- 4Sum
- Loud and Rich
- Product of Array Except Self
- Longest Increasing Subsequence
- Sum of Two Integers
- Majority Element
- Unique Paths
- Longest Palindromic Substring
- Permutations II
- Number of Provinces
- Linked List Cycle II
- Minimum Flips to Make the Binary String Alternate
- Lemonade Change
- House Robber
- Find All Numbers Disappeared in an Array
- Find All Duplicates in an Array
- Same Tree
- Design In-Memory File System
- Design File System
- Asteroid Collision
- Rotting Oranges
- Maximum Subarray
- Top K Frequent Words
- Add Binary
- Multiply Strings

28. Conclusion

Final Remarks

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