Master Leetcode Patterns From Beginning

Course Outlines

Time: 10:00PM PKT

Start Date: 17-08-2025, **Expected End Date:** 00-10-2025

Trainers: Hafiz Noor ul Hassan , Muhammad Taha Faisal, Umar A.

Moderators: M.Areeb, M.Qasim

Duration: 12 Weeks

Goal: To be able to solve any leetcode questions

🗓️ Week 1 – Arrays

Best for hashing, in-place array tricks, and matrix manipulation.

Day	Topic	Problems	LC #s	Recording	Description
Mon	Arrays Basics	Contains Duplicate, Missing Number, Find All Numbers Disappeared in an Array, Single Number	217, 268, 448, 136		Practice hashing and basic frequency/array manipulation problems.
Tue	Arrays Implementation	Convert 1D Array Into 2D Array, Move Zeroes, Product of Array Except Self, Find the Duplicate Number	2022, 283, 238, 287		Work on array transformations, prefix/suffix logic, and duplicate handling.

Wed	Arrays Tricks	Find All Duplicates in an Array, Set Matrix Zeroes, Spiral Matrix	442, 73, 54		Learn in-place tricks, duplicate detection, and traversal techniques.
Thu	Matrix + Sequences	Rotate Image, Longest Consecutive Sequence	48, 128		Focus on matrix rotation and sequence problems using sorting & hashing.
Fri	Advanced Arrays	Factor Combinations, First Missing Positive	254, 41		Handle advanced array problems involving combinatorics and index marking.

📅 Week 2 – Two Pointers

Key for working with sorted arrays, partitions, and subarray-based problems.

Day	Topic	Problems	LC #s	Recording	Description
Mon	Two Pointers Basics	Merge Two Sorted Lists, Two Sum	21, 1		Start with merging and sum-based two-pointer patterns.
Tue	Two Pointers & Strings	Squares of a Sorted Array, Backspace String Compare, Is Subsequence	977, 844, 392		Learn sorted array transformation and string comparison via two pointers.
Wed	Triplet Problems	3Sum, 3Sum Closest	15, 16		Solve classic triplet problems using sorting + two pointers.
Thu	Subarray & Partition	Subarray Product Less Than K, Sort Colors	713, 75		Practice partitioning and subarray constraints with two pointers.
Fri	Water/Area Problems	Container With Most Water, Trapping Rain Water	11, 42		Master area/volume problems with optimal two-pointer movement.

📅 Week 3 – Strings

Focus on string manipulation, subsequences, and backtracking-style string problems.

Day	Topic	Problems	LC #s	Recording	Description
Mon	String Basics	Is Subsequence, Backspace String Compare	392, 844		Practice simple string matching and cleanup using two pointers.
Tue	Substrings	Longest Substring Without Repeating Characters, Longest Palindromic Substring	3, 5		Learn sliding window and DP for substring problems.
Wed	Pattern Matching	Word Search, Palindrome Partitioning	79, 131		Practice backtracking and partitioning strings into valid components.
Thu	Combinatorial Strings	Generate Parentheses, Letter Combinations of a Phone Number	22, 17		Master recursive generation of valid string combinations.
Fri	Advanced Strings	Word Break, Palindromic Substrings	139, 647		Work with DP and substring breakdown for advanced cases.

📅 Week 4 – Sliding Window

Essential for fixed-length and variable-length subarray/substring problems.

Day	Topic	Problems	LC #s	Recording	Description
Mon	Sliding Window Basics	Maximum Average Subarray I, Minimum Size Subarray Sum	643, 209		Learn fixed-size and minimum-size window computations.

Tue	String Windows	Permutation in String, Longest Repeating Character Replacement	567, 424		Use frequency maps and window resizing for string constraints.
Wed	Window Maximums	Sliding Window Maximum, Subarray Product Less Than K	239, 713		Practice handling maximums in windows and multiplicative subarray bounds.
Thu	Advanced Substrings	Minimum Window Substring, Count Unique Characters of All Substrings	76, 828		Solve complex substring/window problems with maps and counts.
Fri	Mixed Patterns	Substring with Concatenation of All Words, Fruit Into Baskets	30, 904		Compound sliding window with multi-word matching and bucket constraints.

📅 Week 5 – Linked List

Covers fast & slow pointers, cycle detection, and in-place reversal.

Day	Topic	Problems	LC #s	Recording	Description
Mon	Basics	Merge Two Sorted Lists, Remove Duplicates from Sorted List	21, 83		Start with merging and cleanup operations.
Tue	Cycle Detection	Linked List Cycle, Linked List Cycle II	141, 142		Detect cycles using fast/slow pointers.
Wed	Node Removal	Remove Linked List Elements, Remove Nth Node From End of List	203, 19		Practice deletion from linked lists.
Thu	In-place Reversal	Reverse Linked List, Reverse Linked List II, Rotate List	206, 92, 61		Reverse portions of lists in place.

Fri	Advanced	Reorder List, Odd Even Linked List, Swap Nodes in Pairs	143, 328, 24		Reordering and pair-based transformations.

📅 Week 6 – Stack & Queue

Problems using stack/monotonic stack and queue-based designs.

Day	Topic	Problems	LC #s	Recording	Description
Mon	Stack Basics	Valid Parentheses, Min Stack	20, 155		Basic stack usage and design.
Tue	Monotonic Stack I	Daily Temperatures, Next Greater Element I	739, 496		Practice monotonic stack for next greater problems.
Wed	Monotonic Stack II	Next Greater Element II, Largest Rectangle in Histogram	503, 84		Handle circular arrays and histogram area.
Thu	Queue	Implement Queue using Stacks, Design Circular Queue	232, 622		Queue simulation and circular structure.
Fri	Advanced	Evaluate Reverse Polish Notation, Asteroid Collision	150, 735		Apply stack to expression parsing and collision problems.

📅 Week 7 – Binary Search

Classic binary search and variations.

Day	Topic	Problems	LC #s	Recording	Description
Mon	Basics	Binary Search, Find Smallest Letter Greater Than Target	704, 744		Start with plain binary search and modifications.
Tue	Rotated Array	Find Minimum in Rotated Sorted Array, Search in Rotated Sorted Array	153, 33		Binary search in rotated sorted arrays.

Wed	Variants	Find Peak Element, Peak Index in a Mountain Array	162, 852	Practice finding local/global peaks.
Thu	2D Matrices	Search a 2D Matrix, Search a 2D Matrix II	74, 240	Binary search in matrices.
Fri	Advanced	Search in Rotated Sorted Array II, Find K Closest Elements, Median of Two Sorted Arrays	81, 658, 4	Master edge binary search cases.

Week 8 – Trees (DFS + BFS basics)

Day	Topic	Problems	LC #s	Recording	Description
Mon	Basics	Maximum Depth of Binary Tree, Minimum Depth of Binary Tree	104, 111		Intro to recursion/DFS on trees.
Tue	Traversals	Same Tree, Subtree of Another Tree, Invert Binary Tree	100, 572, 226		Compare, check subtrees, and inversion.
Wed	Path Problems	Path Sum, Path Sum II, Path Sum III	112, 113, 437		Explore root-to-leaf and subtree paths.
Thu	BFS	Binary Tree Level Order Traversal, Zigzag Level Order Traversal, Right Side View	102, 103, 199		Breadth-first traversals and level processing.
Fri	Advanced	Diameter of Binary Tree, Lowest Common Ancestor of a Binary Tree, Binary Tree Maximum Path Sum	543, 236, 124		Complex DFS tree problems.

Week 9 – Trie

Covers prefix trees and word search.

Day	Topic	Problems	LC #s	Recording	Description
Mon	Basics	Implement Trie (Prefix Tree)	208		Build a prefix tree for insert/search.

Tue	Word Search	Word Search, Word Search II	79, 212		Use trie + backtracking for word finding.
Wed	Advanced Search	Longest Word in Dictionary, Concatenated Words	720, 472		Build dictionary-based word checking.
Thu	XOR + Prefix/Suffix	Maximum XOR of Two Numbers in an Array, Prefix and Suffix Search	421, 745		Apply trie for bitwise operations and suffix/prefix queries.
Fri	Hard Applications	Palindrome Pairs, Word Squares, Design Search Autocomplete System	336, 425, 642		Full trie usage in string manipulation and autocomplete.

📅 Week 10 – Heap / Priority Queue

Day	Topic	Problems	LC #s	Recording	Description
Mon	Top-K	Kth Largest Element in an Array, Top K Frequent Elements	215, 347		Learn heap for finding top-k elements.
Tue	Geometry	K Closest Points to Origin, Kth Smallest Element in a Sorted Matrix	973, 378		Use heaps for closest/farthest queries.
Wed	Merge & Streams	Merge k Sorted Lists, Find Median from Data Stream	23, 295		Streaming data + merging sorted inputs.
Thu	Range & Scheduling	Smallest Range Covering K Lists, Task Scheduler	632, 621		Greedy + heap usage in scheduling/ranges.
Fri	Advanced	Employee Free Time, Sliding Window Median, Maximum Frequency Stack	759, 480, 895		Complex heap and scheduling applications.

📅 Week 11 – Graphs

Day	Topic	Problems	LC #s	Recording	Description
Mon	Basics	Number of Islands, Graph Valid Tree	200, 261		Learn BFS/DFS on adjacency.

Tue	Components	Number of Connected Components in Graph, Minimum Height Trees	323, 310		Union find + BFS tricks.
Wed	Topological Sort I	Course Schedule, Course Schedule II	207, 210		Classic topological ordering.
Thu	Topological Sort II	Sequence Reconstruction, Alien Dictionary, Sort Items by Groups Respecting Dependencies	444, 269, 1203		Hard topological cases.
Fri	Advanced	All Nodes Distance K in Binary Tree, Pacific Atlantic Water Flow	863, 417		BFS/DFS extensions in trees + grids.

📅 Week 12 – Backtracking

Day	Topic	Problems	LC #s	Recording	Description
Mon	Subsets & Combinations	Subsets, Subsets II, Combinations	78, 90, 77		Generate subsets and combinations.
Tue	Permutations	Permutations, Permutations II, Letter Case Permutation	46, 47, 784		Focus on permutation generation.
Wed	Combination Sum	Combination Sum, Combination Sum II, Combination Sum III, Combination Sum IV	39, 40, 216, 377		Variants of subset sums.
Thu	Strings	Generate Parentheses, Palindrome Partitioning, Letter Combinations of a Phone Number	22, 131, 17		Backtracking on string construction.
Fri	Hard	N-Queens, Sudoku Solver, Split String Into Max Unique Substrings, Generalized Abbreviation	51, 37, 1593, 320		High-level backtracking puzzles.

🗓️ Week 13 – Dynamic Programming

Day	Topic	Problems	LC #s	Recording	Description
Mon	Basics	Climbing Stairs, House Robber, House Robber II	70, 198, 213		Intro to 1D DP for simple choices.
Tue	Subarrays	Maximum Subarray, Maximum Product Subarray	53, 152		Learn Kadane's algorithm for max sum/product.
Wed	Knapsack & Partition	Partition Equal Subset Sum, Partition to K Equal Sum Subsets, Target Sum	416, 698, 494		Subset-sum style problems.
Thu	Coins & Counting Ways	Coin Change, Combination Sum IV, Decode Ways	322, 377, 91		Counting possibilities using DP.
Fri	Sequences & Strings	Longest Increasing Subsequence, Number of LIS, Longest Palindromic Substring, Palindromic Substrings	300, 673, 5, 647		Work with subsequences and palindromes.
Sat	Paths & Breaks	Unique Paths, Word Break, Jump Game, Best Time to Buy and Sell Stock with Cooldown	62, 139, 55, 309		Grid paths, string segmentation, and greedy-DP mix.
Sun	Advanced Applications	Edit Distance, Regular Expression Matching, Wildcard Matching	72, 10, 44		Hard DP cases on string matching/editing.

🗓️ Week 14 – Greedy + Miscellaneous

Day	Topic	Problems	LC #s	Recording	Description
Mon	Interval Scheduling	Non-overlapping Intervals, Minimum Number of Arrows to Burst Balloons	435, 452		Classic greedy interval problems.

Tue	Gas & Scheduling	Gas Station, Task Scheduler	134, 621	Greedy scheduling and circular gas station tour.
Wed	Advanced Greedy	Course Schedule III, Reorganize String	630, 767	Optimal reordering and task selection.
Thu	Miscellaneous Design	Serialize and Deserialize Binary Tree, Find Median from Data Stream	297, 295	Learn design-based problems requiring data structures.
Fri	Hard Greedy + Heap	Sliding Window Median, Employee Free Time	480, 759	Advanced scheduling and medians in sliding windows.