Strategy:

* Easy: 30mins
* Medium: 45mins
* Hard: 1hr

If close to the solution throw in extra 10 mins

Arrays and Strings

If problems want to return an array you should return in the conditions (if) to end the loop if find a valid value🡪 stopping loops

1. Two Pointers: Used for finding pairs or elements that meet specific criteria.

* List elements increasing
* Use two pointer I pointer is head of array; another pointer is tail of array.
* Two pointer i and j should only change when satisfy the condition.

1. Sliding Window: Maintains a subset of elements within a larger dataset.

* Find subarrays to satisfy the condition.
* Initialize a sliding window, use that for browse.

1. Kadane's Algorithm: used to find the maximum subarray sum in an array of numbers.
2. Prefix Sum: Precompute cumulative sums for quick range queries.
3. Bit Manipulation: XOR

* A XOR A = 0; A XOR 0 = A;
* If you see a duplicate number and don’t use extra place.

LinkedList

* In situations you want create a new list that don’t change any thing in original lists use dummy node as a starting point.
* In situations change original list like reverse list you can use current node is equal to head

Trees

1. Depth-First Search (DFS): Preorder, inorder, and postorder traversals.
2. Breadth-First Search (BFS): Level-order traversal.
3. Binary Search Tree (BST) operations: Insertion, deletion, and validation.
4. Tree construction: From preorder/inorder or postorder/inorder traversals.

Hash Tables

1. Frequency counting: Track occurrences of elements.
2. Two Sum pattern: Find pairs with a specific sum.
3. Anagram detection: Compare character frequencies.
4. Caching: Store computed results for quick lookup.

Graphs

1. Depth-First Search (DFS): Explore paths deeply before backtracking.
2. Breadth-First Search (BFS): Explore nodes level by level.
3. Topological Sort: Order nodes in a directed acyclic graph.
4. Union Find: Detect cycles and connect components.

Stacks

1. Parentheses matching: Validate balanced brackets.
2. Monotonic stack: Maintain increasing/decreasing order for next greater/smaller element problems.
3. Expression evaluation: Evaluate arithmetic expressions.

Queues

1. BFS implementation: Level-order traversal in graphs and trees.
2. Task scheduling: Manage order of operations.
3. Sliding window problems: Maintain a window of elements.

Heaps

1. Top K Elements Pattern: Find or manipulate the K largest/smallest elements in a collection.
2. Merge K Sorted Pattern: Combine K sorted lists or arrays into a single sorted list.
3. Two Heaps Pattern: Use two heaps to track median or balance elements in a stream.
4. Sliding Window Median Pattern: Calculate median in a sliding window over a stream of numbers.
5. Scheduling Pattern: Manage tasks or intervals using a heap for efficient scheduling.