Strategy:

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

If close to the solution throw in extra 10 mins

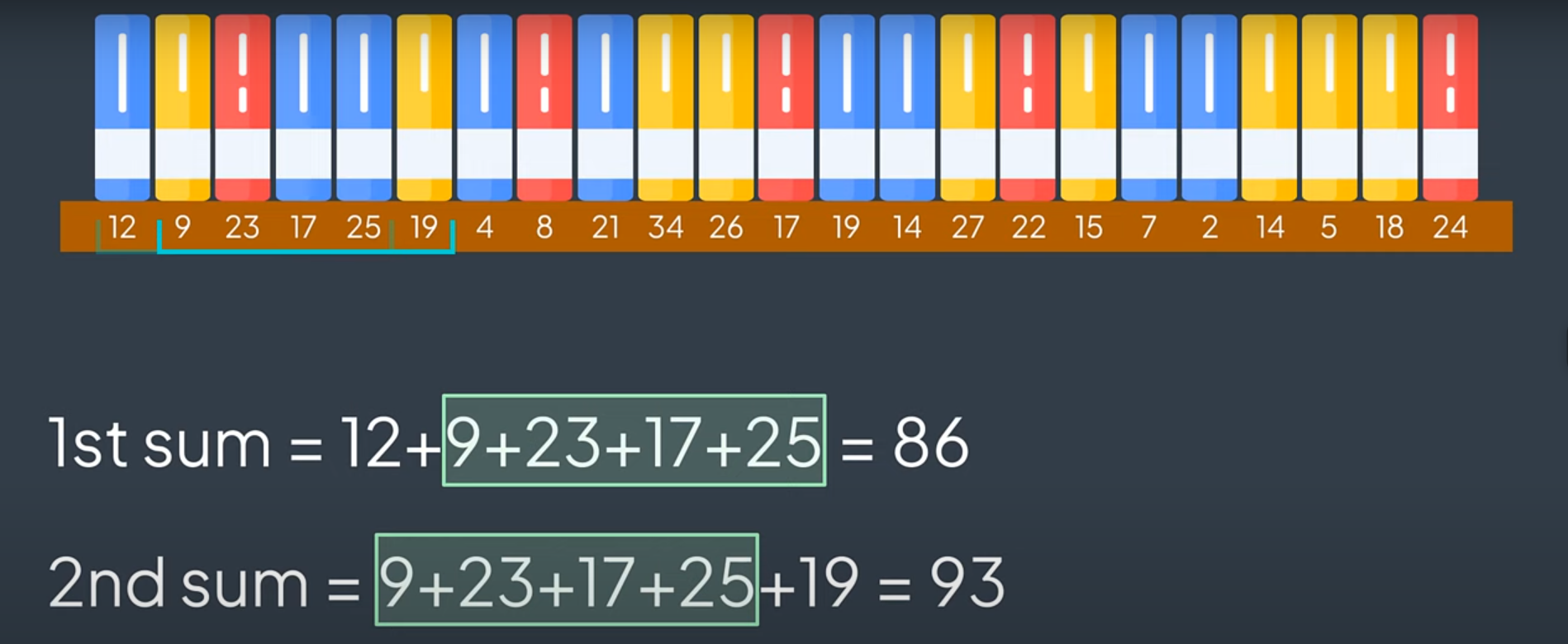
Arrays and Strings

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. Then we keep moving that window by extending it and shrinking it while respecting constraints until we finish the hold input.



1. Prefix Sum: Precompute cumulative sums for quick range queries.
2. Bit Manipulation: XOR

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

Hash Map

1. Find number of subarrays
2. Sliding window

LinkedList

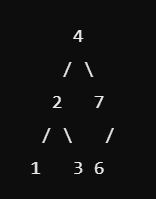
* In situations you want create a new list that don’t change any thing in original lists use dummy node as a starting point.
* In situations change original list like reverse list you can use current node is equal to head
* If you want to copy from the original list you must create heads of two list and two pointers to keep track two lists.

Trees

* Finding one or more base cases
* Calling the same function on the left subtree
* Calling the same function on the right subtree
* Joining the results

Note:

* The height of a node: 1+ max(leftHeight, rightHeight).
* The recursive must store in value except modify tree.

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.