Hashmap

1. Given an array of integers, find the first repeating element.
2. Determine if two strings are anagrams of each other using a hashmap.
3. Count the frequency of each character in a string and return the results.
4. Find the longest substring without repeating characters.
5. Given an array of words, group the words that are anagrams.

Sorting and Searching

6. Find the intersection of two arrays.
7. Determine if a given value exists in a sorted 2D matrix.
8. Given an unsorted array, find the median value.
9. Find all pairs in an array that sum to a specific target.
10. Given a list of scores, find the second highest score.

Tree Concepts

11. Given a binary tree, determine its maximum depth.
12. Check if a binary tree is a valid binary search tree (BST).
13. Find all leaf nodes in a binary tree.
14. Determine the level order traversal of a binary tree.
15. Count the number of nodes in a complete binary tree.

Recursion

16. Generate all permutations of a given string.
17. Solve the N-Queens problem using recursion.
18. Count how many ways you can climb to the top of a staircase with variable steps.
19. Write a function to determine if a string is a palindrome using recursion.
20. Find all combinations of a set of numbers that sum to a target value.

Divide and Conquer

21. Find the maximum element in a rotated sorted array.
22. Determine the closest pair of points from a set of points using a divide and conquer approach.
23. Count the number of occurrences of a number in a sorted array.
24. Find the largest rectangle in a histogram.
25. Given two sorted arrays, find the median of the two sorted arrays.

Heap Data Structure

26. Find the kth largest element in an unsorted array.
27. Given a list of tasks with their durations, determine the order to complete them using a heap.
28. Merge k sorted linked lists into one sorted linked list.
29. Implement a function to find the top k frequent elements in an array.
30. Create a function to determine the minimum cost to connect all ropes given their lengths.