**Exercise 1: Find the sum of all elements in an array.**

**Exercise 2: Find the maximum element in an array.**

**Exercise 3: Find the minimum element in an array.**

**Exercise 4: Calculate the average of elements in an array.**

**Exercise 5: Check if an element exists in an array.**

**Exercise 6: Reverse an array.**

**Exercise 7: Count the occurrences of a specific element in an array.**

**Exercise 8: Find the second largest element in an array**.

**Exercise 9: Rotate an array to the right by a given number of positions.**

**Exercise 10: Find the common elements between two arrays.**

**Exercise 11: Find the index of the first occurrence of a specific element in an array.**

**Exercise 12: Find the index of the last occurrence of a specific element in an array.**

**Exercise 13: Find the equilibrium index of an array (an index where the sum of elements at lower indexes is equal to the sum of elements at higher indexes).**

**Exercise 14: Remove duplicates from a sorted array in-place (without using additional data structures).**

**Exercise 15: Check if an array is sorted in ascending order.**

**Exercise 16: Check if an array is sorted in descending order.**

**Exercise 17: Find the product of all elements in an array.**

**Exercise 18: Check if an array contains only even numbers.**

**Exercise 19: Check if an array contains only prime numbers.**

**Exercise 20: Find the kth smallest element in an array.**

**Exercise 21: Find the median of an array.**

**Exercise 22: Find the subarray with the maximum sum, allowing for an empty subarray (Kadane's algorithm with a twist).**

**Exercise 23: Check if an array is a palindrome (reads the same forwards and backwards).**

**Exercise 24: Find the longest subarray with a specific sum.**

**Exercise 25: Merge two sorted arrays into a single sorted array.**

**Exercise 26: Find the longest increasing subarray within an array.**

**Exercise 27: Find the missing number in an array containing consecutive integers.**

**Exercise 28: Rotate a square matrix (2D array) 90 degrees clockwise.**

**Exercise 29: Check if two arrays are equal (contain the same elements in the same order).**

**Exercise 30: Find the longest subarray with a sum less than or equal to a given target sum.**

**Exercise 31: Find the second smallest element in an array.**

**Exercise 32: Find the longest subarray with equal number of even and odd elements.**

**Exercise 33: Find the maximum subarray sum using Kadane's algorithm.**

**Exercise 34: Find the smallest missing positive integer in an array.**

**Exercise 35: Find the majority element (element that appears more than n/2 times) in an array.**

**Exercise 36: Find the longest subarray with even sum.**

**Exercise 37: Find the longest subarray with odd sum.**

**Exercise 38: Find the maximum product of any two elements in an array.**

**Exercise 39: Reverse an array in-place (without using additional data structures).**

**Exercise 40: Find the longest increasing subarray with contiguous elements**.

**Exercise 41: Check if an array is a rotation of another array.**

**Exercise 42: Find the smallest subarray with a sum greater than or equal to a given target sum.**

**Exercise 43: Rotate an array to the right by k steps.**

**Exercise 44: Find the maximum sum subarray of a circular array.**

**Exercise 45: Find the kth largest element in an unsorted array (QuickSelect algorithm) without using methods:**

**Exercise 46: Implement an ArrayList from scratch without using methods.**

**Exercise 47: Find the common elements in three sorted arrays without using methods.**

**Exercise 48: Merge two sorted arrays without using methods.**

**Exercise 49: Find the majority element in an array without using methods.**

**Exercise 50: Search in a rotated sorted array without using methods.**