Sorting Questions

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Insertion Sort

1. **Sort an Array: Given an array of integers, sort it in ascending order using insertion sort.**
   Example:
   Input: [4, 3, 2, 1]
   Output: [1, 2, 3, 4]

2. **Insert into a Sorted Array: Given a sorted array and a new number, insert it at the correct position while maintaining the sorted order.**
   Example:
   Input: arr = [1, 3, 5, 7], num = 4
   Output: [1, 3, 4, 5, 7]

Selection Sort

1. **Sort an Array: Given an unsorted array, sort it using selection sort.**
   Example:
   Input: [29, 10, 14, 37, 13]
   Output: [10, 13, 14, 29, 37]

2. **Find Kth Smallest Element: Given an unsorted array, find the kth smallest element using selection sort.**
   Example:
   Input: arr = [7, 10, 4, 3, 20, 15],

   k = 3
   Output: 7
   (Hint: Modify selection sort to stop after k iterations.)

Bubble Sort

1. **Sort an Array: Implement bubble sort to sort a given array in ascending order.**
   Example:
   Input: [5, 1, 4, 2, 8]
   Output: [1, 2, 4, 5, 8]

2. **Count Swaps in Bubble Sort: Count the number of swaps performed while sorting an array using bubble sort.**
   Example:
   Input: [5, 1, 4, 2, 8]
   Output: 5 swaps

Merge Sort

1. **Sort an Array: Given an array of integers, sort it using merge sort.**
   Example:
   Input: [12, 11, 13, 5, 6, 7]
   Output: [5, 6, 7, 11, 12, 13]

2. **Merge Two Sorted Arrays: Given two sorted arrays, merge them into one sorted array (without using extra sorting functions).**
   Example:
   Input: arr1 = [1, 3, 5], arr2 = [2, 4, 6]
   Output: [1, 2, 3, 4, 5, 6]