1. **Explain different sorting algorithms (Bubble Sort, Insertion Sort, Quick Sort, Merge Sort)**

**Bubble Sort:**

* Bubble Sort repeatedly steps through the list, compares adjacent elements, and swaps them if they are in the wrong order. The pass through the list is repeated until the list is sorted.
* Time Complexity: O(n2)

**Insertion Sort:**

* Insertion Sort builds the sorted array one element at a time by repeatedly picking the next element and inserting it into the correct position.
* Time Complexity: : O(n2)

**Quick Sort:**

* Quick Sort is a divide-and-conquer algorithm that picks a pivot element and partitions the array into two sub-arrays, according to whether the elements are less than or greater than the pivot. It then recursively sorts the sub-arrays.
* Time Complexity: O(n log n)

**Merge Sort:**

* Merge Sort is a divide-and-conquer algorithm that divides the array into two halves, sorts them recursively, and then merges the two sorted halves.
* Time Complexity: O(n log n)