1. Which sorting algorithm has the best time complexity for large datasets in most scenarios?
   1. Bubble Sort
   2. Selection Sort
   3. **Merge Sort**
   4. Quick Sort
2. In the Pigeonhole Sort algorithm, what is the time complexity in the worst case?
   1. O(n)
   2. O(n log n)
   3. **O(n^2)**
   4. O(n^3)
3. What is the primary advantage of using Counting Sort over other comparison-based sorting algorithms?
   1. **Stability**
   2. In-place sorting
   3. Better average-case time complexity
   4. Ability to handle non-integer inputs
4. Merge Sort algorithm uses \_\_\_\_\_\_\_ for merging two subarrays.
   1. Bubble Sort
   2. **Quick Sort**
   3. Selection Sort
   4. Binary Search
5. Quick Sort algorithm is an example of \_\_\_\_\_\_\_ sorting.
   1. **Divide and Conquer**
   2. Insertion
   3. Radix
   4. Pigeonhole
6. Which sorting algorithm can be used to sort a linked list efficiently?
   1. **Merge Sort**
   2. Bubble Sort
   3. Counting Sort
   4. Quick Sort
7. What is the time complexity of the Radix Sort algorithm?
   1. O(n)
   2. O(n log n)
   3. O(n^2)
   4. **O(nk), where k is the number of digits in the largest number**
8. Which sorting algorithm exhibits the best performance for sorting nearly sorted arrays?
   1. Bubble Sort
   2. Quick Sort
   3. **Insertion Sort**
   4. Heap Sort
9. The Pigeonhole Principle states that if there are 'n' items to be placed in 'm' containers, and 'n > m', then at least \_\_\_\_\_\_\_\_ container will have more than one item.
   1. 1
   2. **2**
   3. n-m+1
   4. m-n+1
10. What is the maximum number of inversions in an array of 'n' elements that is already sorted in ascending order?
    1. **0**
    2. n
    3. n(n-1)/2
    4. n^2
11. Which of the following sorting algorithms is not suitable for large datasets due to its quadratic time complexity in the worst case?
    1. Merge Sort
    2. Insertion Sort
    3. **Bubble Sort**
    4. Heap Sort
12. When using the counting sort algorithm to sort an array of integers, what is the required range of input values?
    1. From -∞ to +∞
    2. 0 to MAX\_INT
    3. -MAX\_INT to +MAX\_INT
    4. **1 to n (where n is the size of the array)**
13. In which scenario is it best to use the Insertion Sort algorithm?
    1. Large datasets
    2. **Nearly sorted arrays**
    3. Randomly distributed data
    4. Data with a large number of unique elements
14. Which sorting algorithm can be used to sort a doubly linked list efficiently?
    1. Quick Sort
    2. Bubble Sort
    3. **Merge Sort**
    4. Selection Sort
15. In Quick Sort, the process of dividing the array into two subarrays is called:
    1. **Partitioning**
    2. Merging
    3. Selection
    4. Shuffling
16. Which sorting algorithm is an example of an in-place sorting algorithm?
    1. Merge Sort
    2. Counting Sort
    3. **Heap Sort**
    4. Radix Sort
17. What is the space complexity of the Counting Sort algorithm?
    1. O(1)
    2. O(n)
    3. **O(k), where k is the range of input values**
    4. O(n^2)
18. The Radix Sort algorithm can be used to sort:
    1. **Integers only**
    2. Characters only
    3. Floats only
    4. Integers, characters, and floats
19. What is the best-case time complexity of the Bubble Sort algorithm?
    1. **O(n)**
    2. O(n log n)
    3. O(n^2)
    4. O(1)
20. Which sorting algorithm is not affected by the initial order of elements in the input array?
    1. Selection Sort
    2. **Merge Sort**
    3. Bubble Sort
    4. Insertion Sort
21. In which scenario is the Heap Sort algorithm most suitable?
    1. When the dataset is already partially sorted
    2. When the dataset contains a large number of duplicates
    3. **When the dataset is distributed uniformly at random**
    4. When the dataset is stored in a binary heap
22. The process of dividing the array into two subarrays in Merge Sort is known as:
    1. Partitioning
    2. Merging
    3. Selection
    4. **Dividing**
23. What is the time complexity of the Heap Sort algorithm in the worst case?
    1. O(n)
    2. **O(n log n)**
    3. O(n^2)
    4. O(log n)
24. Which sorting algorithm is not a comparison-based sorting algorithm?
    1. Quick Sort
    2. Merge Sort
    3. **Radix Sort**
    4. Selection Sort
25. The term "pivot" is commonly associated with which sorting algorithm?
    1. Bubble Sort
    2. Insertion Sort
    3. Merge Sort
    4. **Quick Sort**
26. The Bucket Sort algorithm uses the principle of:
    1. **Pigeonhole Principle**
    2. Divide and Conquer
    3. Recursion
    4. Dynamic Programming
27. In Merge Sort, what is the main advantage of using an auxiliary array for merging two subarrays?
    1. It reduces the time complexity of merging
    2. **It allows for sorting of non-contiguous elements**
    3. It improves the space complexity of the algorithm
    4. It helps to handle duplicate elements efficiently
28. In the Pigeonhole Sort algorithm, the range of elements determines the size of the:
    1. **Pigeonholes**
    2. Buckets
    3. Swaps
    4. Inversions
29. Which sorting algorithm is not an in-place sorting algorithm?
    1. Bubble Sort
    2. **Heap Sort**
    3. Quick Sort
    4. Selection Sort
30. The Radix Sort algorithm sorts elements based on their:
    1. Comparison with a pivot element
    2. **Binary representation**
    3. Frequency of occurrence
    4. Position in the original array
31. The time complexity of the Quick Sort algorithm can be improved using:
    1. Bubble Sort
    2. Insertion Sort
    3. **Tail Recursion**
    4. Selection Sort
32. Which sorting algorithm has the best average-case time complexity for large datasets?
    1. Bubble Sort
    2. Selection Sort
    3. Heap Sort
    4. **Merge Sort**
33. Which sorting algorithm is not stable?
    1. Merge Sort
    2. Counting Sort
    3. **Quick Sort**
    4. Bubble Sort
34. The number of passes required by the Bubble Sort algorithm to sort a dataset of size 'n' is:
    1. **n-1**
    2. n
    3. n+1
    4. n^2
35. The time complexity of the Bucket Sort algorithm depends on:
    1. The number of elements in the dataset
    2. The number of buckets used
    3. **The range of input values**
    4. The size of the auxiliary array