4 Lecture - CS502

Important Subjective

1. **What is sorting?**
   Answer: Sorting is the process of arranging items in a specific order, typically numerical or alphabetical order, to make them easier to access, search, and analyze.

   What is the difference between stable and unstable sorting algorithms?
   Answer: Stable sorting algorithms maintain the relative order of equal elements in the sorted output, while unstable sorting algorithms do not guarantee this.

   What is the worst-case time complexity of bubble sort?
   Answer: The worst-case time complexity of bubble sort is O(n^2), where n is the number of items being sorted.

   What is quick sort, and how does it work?
   Answer: Quick sort is a divide-and-conquer sorting algorithm that works by partitioning an array into two sub-arrays, one containing elements less than a pivot element, and the other containing elements greater than the pivot. It then recursively sorts the sub-arrays.

   What is the difference between in-place and out-of-place sorting algorithms?
   Answer: In-place sorting algorithms sort the input array by modifying it, while out-of-place sorting algorithms sort the input array by creating a new, sorted array.

   What is insertion sort, and how does it work?
   Answer: Insertion sort is a simple sorting algorithm that works by iterating through an array, comparing each element with the preceding elements, and swapping them if they are out of order.

   What is the difference between comparison-based and non-comparison-based sorting algorithms?
   Answer: Comparison-based sorting algorithms compare elements in the input array to determine their order, while non-comparison-based sorting algorithms use other methods, such as counting or hashing, to sort the elements.

   What is merge sort, and how does it work?
   Answer: Merge sort is a divide-and-conquer sorting algorithm that works by dividing an array into two halves, recursively sorting each half, and then merging the two sorted halves into a single sorted array.

   What is radix sort, and how does it work?
   Answer: Radix sort is a non-comparison-based sorting algorithm that works by sorting elements based on their digits or characters, from the least significant to the most significant.

   What is the best-case time complexity of quick sort?
   Answer: The best-case time complexity of quick sort is O(n log n), where n is the number of

items being sorted.