# 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

