

Tutorial 5 on Quicksort

Data Structures and Algorithms Lab, 4th Feb, 2025

Evaluation Tasks

Task 1: Implement 3-Way Quicksort

(10 marks)

Objective

Implement 3-Way Quicksort that partitions the array into three segments:

1. Elements less than the chosen pivot.
2. Elements equal to the pivot.
3. Elements greater than the pivot.

Input and Output Specification

- **Input Example:** An unsorted array such as [3, 2, 1, 3, 2, 1].
- **Expected Output:** A sorted array with duplicate values grouped, e.g., [1, 1, 2, 2, 3, 3].

Task 2: Compare Quicksort vs. Mergesort

(5 marks)

Criteria	Quicksort		Mergesort	
Best-case Time Complexity		?		?
Average-case Time Complexity		?		?
Worst-case Time Complexity		?		?
Space Complexity		?		?
Stability		?		?