

CS2023 - Data Structures and Algorithms

Take Home Assignment

Week 3 - Recursion

March 16, 2023

You are required to answer the below questions and submit a PDF to the submission link provided under this week before the deadline (no extensions will be provided). You can either write / type your answers, but either way your answers should be readable.

Question 1

Please write pseudo codes to solve the following problems.

Note: Your solutions must be recursive

1. Calculating the n^{th} factorial of a number.
2. Searching for an element in an array.
3. Checking whether a given string is a palindrome.

Question 2

Comment on the time complexities of the above algorithms.

Note: Just stating the complexities is fine, no need to explain

Question 3

Analyze the worst case time complexity of the Merge algorithm.

Note: Do not just state the worst case complexity, you are required to explain how you arrived at the answer.