

Algorithms and Data Structures

Spring 2022

Assignment (1)

Question 1 (3 points):

Implement the following using Java code:

1. Create an array of strings containing your first name, middle name, and last name.
2. Add a Java method to sort an array using either insertion sort, merge sort, or quick sort. At the beginning of the method, add a comment to describe your selected algorithm, and its time complexity.
3. Sort the array you created in (1) using the method in (2), and printout the sorted array.

Your answer should include the **code in a .java file** and a **screenshot** showing the tests output.

Question 2 (2 points):

Using the **Stack** class in Java, write a method that takes an array of strings representing a sequence of HTML tags and returns *true* if each tag is correctly closed with a closing tag, and *false* otherwise.

Test the method with the following inputs:

Inputs	Expected output
["<div>", "<h1>", "Algorithms are Fun", "</h1>", "</div>"]	True (valid)
["<div>", "", "</div>", ""]	False (invalid)
["<html>", "</head>", "<head>", "</html>"]	False (invalid)
["<html>", "<head>", "</head>", "<body>", "</body>"]	False (invalid)

At the beginning of your test code, add a print statement to print your name and ID.

Your answer should include the **code in a .java file** and a **screenshot** showing the tests output (including your name and ID).