CS 353 Analysis of Algorithms Fall 2022

Assignment 2

University of Wisconsin - La Crosse

1. Quick Sort. (5 pts.)

Description:

Given an array of integers nums, use Quick Sort algorithm to sort the array in ascending order and return it.

You must solve the problem without using any built-in functions in $O(nlog(n))$ time complexity and with the smallest space complexity possible.

Example 1:

Input(s):

- array: [5,2,3,1]

Output:

- array [1,2,3,5]

Example 2:

Input(s):

- array: [5,1,1,2,0,0]

Output:

- array [0,0,1,1,2,5]

2. Binary Merge Sort. (5 pts.)

Description:

Given an array of integers nums, use Binary Merge Sort algorithm to sort the array in ascending order and return it.

You must solve the problem without using any built-in functions in $O(nlog(n))$ time complexity and with the smallest space complexity possible.

Example 1:

Input(s):

- array: [5,2,3,1]

Output:

- array [1,2,3,5]

Example 2:

Input(s):

- array: [5,1,1,2,0,0]

Output:

- array [0,0,1,1,2,5]

Note:

1. Please download the coding template from canvas.
2. Please complete the Java code in "Algorithm.java." Run "Test.java" to test your solution.
3. Test cases can be found in "Test.java".
4. Please follow the submission guideline (on Canvas) to submit the *archived eclipse project*.