BLM19307E Algorithm Analysis & Design- Project 1

Due Date: December 11, 2022, at 23:59

In this project, you are expected to design an experimental study for the comparison of the following sorting algorithms: Selection Sort, Insertion Sort, Merge Sort, Quick Sort with Lomuto & Hoare partitioning, and Heapsort.

You must implement each of the sorting algorithms in Java. You must design the experiments for the comparison of all algorithms both theoretically and empirically. You must write a detailed report including the pseudo-code of the algorithms, the time complexity of the algorithms, the experimental design, and your results. You can provide some plots (scatter, line etc.) to illustrate your results.

You can use write many Java classes for implementing the sorting algorithms. However, you must write a Main.java class that tests each implemented sorting algorithm for different input types and sizes.

Example:

```
Main.java

public static void main(String[] args){
      //HeapSort hs = new HeapSort()
      //hs.run(array)

      //MergeSort ms = new MergeSort()
      //ms.run(array)

}
```

Good Luck,
Asst. Prof. Berna Kiraz,Res. Asst. Zeki Kuş,
Res. Asst. Ertuğrul İslamoğlu

Grading:

1) Implementation - 15 points
2) Mathematical analysis of each algorithm – 20 points
3) Experimental design – 50 points
4) Results and discussion – 15 points

Submission:

Please zip and submit all your files using filename NameSurnameHW1.zip

1) Java source code
2) Report in PDF format

Notes:

1) In case of any form of **copying and cheating** on solutions, all parts will get **ZERO** grade. You should submit your own work. In case of any forms of cheating or copying, both giver and receiver are equally culpable and suffer equal penalties. **All types of plagiarism will result in zero grade from the homework.**

2) No late submission will be accepted.