CENG 2002 - Data Structures - Spring 2021
Homework #4

Due date : 06/06/2021 - 23:59

Assignment: Generating a simplified version of the empirical comparison table in Figure 7.20 of the text book

- **Algorithms to compare**
  - Insertion Sort
  - Bubble Sort
  - Selection Sort
  - Shell Sort (With 2^k gaps)
  - Merge Sort
  - Quick Sort
  - Quick Sort Optimized (With Insertion sort for small subsets)
  - Heap Sort
  -
- **List size for comparison (List of non-negative integers)**
  - 10
  - 1000
  - 100K
  - 1M numbers
  - With sorted 100K
  - With reverse sorted 100K

To compute processing times:

- Implement each sorting method. You can use the implementation in the text book but do not use any other library.
- Randomly generate at least 10 Sets for each comparison numbers. For example, to compare for a list of 100 numbers, generate 10 different random list of 100 numbers and run the sorting methods for each list (By list, I mean a set of numbers. Do not need to keep them in a list data structure). Then take the average processing times.
- Search for time measurement functions in Windows,(or in Linux or Mac if you use them) and use it.

Your program must **generate a CSV file with the table format similar to the Figure 7.20 so that we can open it in a spreadsheet program.** A

CSV file is the set of data columns separated with a comma, ’,’. Each row starts in the newline.

Notes:

- Do not forget to submit a generated CSV file
- You can use the implementations in the lab sessions.

Submit:

- **All cpp and header files and a generated CSV file**

Late submission:

- You get no credits for late submissions.