Data Structures | Spring 2023
Assignment 1 [100 Point]

Sorting Algorithms Package

In this assignment you are required to implement a number of sorting algorithms from scratch and test your algorithms using randomly generated datasets of different sizes.

Requirements:

1. Create a package (namespace) called *sortlib* that contains the following sorting algorithms:
   - Insertion sort, selection sort, bubble sort, shell sort, count sort, merge sort, and quick sort.
2. Each algorithm should be a separate function implemented using *templates* to allow sorting data of different types.
3. For each algorithm:
   - Test the algorithm on randomly generated arrays of sizes 200, 500, 1000, 5000, 10000, 20000, 50000.
   - Calculate the running time on each dataset.
   - Draw a plot for the algorithm to see how the running time changes according to the different sizes of your datasets (*You can do it using excel*).

Deliverables:

1. Source file of your code (*.cpp File*)
2. Report (*.pdf File*) that contains all plots for all the algorithms.

Submission Rules:

1. You will upload a zipped folder that contains your *.cpp* and *.pdf* files **(Don't include any .exe files in your submission)**.
2. Assignment submission is on Google Classroom **(No submission through mail)**.
3. Assignment is submitted in **teams of 3** from any group.
4. Follow this convention for naming your folder: ID1_ID2_ID3_A#_G# (i.e 20200111_20200222_20200333_A1_G5_G6)
5. Deadline of the Assignment: **23 March 2023 - 11:59 PM.**
6. **Failing to follow any of the above rules will lead to discard your submission and consider that your team didn't submit.**