BIRZEIT UNIVERSITY

Department of Computer Science

COMP2421 - Data Structures and Algorithms
(First Semester – Fall 2023/2024)

Project#4 Due Date: 2 February 2024 @11:00 PM

In this report, you have to answer the following questions:

1. Sorting:
    a. You are required to search/study/report 3 new sorting algorithms. For each algorithm illustrate how it works with an example and code of the functions, state the time and space complexity of various scenarios (if the data is generated at random, if the data is sorted ascending, or if the data is sorted descending).
2. Dynamic Programming:
    a. What is Dynamic Programming?
    b. Mention three problems that can be solved using Dynamic Programming.
    c. Show an example of a code that solves a problem using Dynamic Programming and without using Dynamic Programming.

Your final report should include:

- Your student name, student ID, and section number.
- A final page contains the used references in your report.

The following methods should not be in your list:

1. Insertion
2. Selection
3. Bubble
4. Shell
5. Merge
6. Heap
7. Radix

Submission instructions:

1. **This is individual work**. It should represent your own efforts. It is fine to discuss your work and to ask your colleagues, but you are not allowed to copy/paste the work of others or give your work to anyone else, copy/paste from websites and other references is not

allowed as well. You should describe the algorithms in your own words. As well, if you use an image from the internet please include it in the references.

2. **Document format**. Your submission should be a PDF document and named as:
   "**P4_YourStudentID_FirstNameLastName_SectionNo.pdf**".
   E.g., P4_1199999_MohammedAhmed_4.docx → given this student in section 3.
3. You will be responsible of any plagiarism in your reports.
4. Make sure to include proper references of the paper.
5. Make sure to explain the concepts "In Your Own Words!". No copy-paste is allowed.
6. In the discussion you may be asked about everything you include in your writing, so make sure you understand it well.