Department of Computer Science

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

Project#1 Due Date: 28 November 2023 (by mid-night)

In this project, you will implement an application of Linked Lists: **Radix Sort**.

Your application should be able to sort a list of <u>strings</u> (i.e., words and assume words start only with letters) from an input file using Radix Sort. This should be done using a **doubly** implementation of the Linked List.

Assume the maximum length of the input string is 30 characters; the input file would contain an unspecified number of strings. The input file should contain one string in each line. Having read the strings successfully, your application should then sort the input strings using the Radix Sort algorithm.

The user should be displayed a menu with the options necessary to run the functionalities of the program (i.e., read the input file, print the strings before sorting, sort the strings, print the sorted strings, and exit).

Your application should be able to show the following information through a proper menu of the application:

1. Load the strings
2. Print the strings before sorting
3. Sort the strings
4. Print the sorted strings
5. Add a new word to the list of sorted strings (and sort it)
6. Delete a word from the sorted strings
7. Save to output file
8. Exit

The deadline of this assignment will be on December 3rd, 2023. LATE SUBMISSIONS will not be accepted for any reason. Please make sure that your application is running properly on your laptop before the discussion. Project discussions will be decided later.

Grading policy:

1. Your application should have all functionalities working properly. **Twenty** marks will be graded for the functionality of the project;
2. The following notes will make up the remaining 10 marks of the grade:
   a. There has to be adequate documentation and comments in the code (i.e., functions, loops, etc.);
   b. Your code should follow the code convention (i.e., spaces, indentations, etc.); and
   c. Your application should contain a menu to allow the user to select which option (s) he would like to run.

Notes and 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. You are not allowed to post/copy from other websites and/or social media and this will be considered as cheating.
2. Any **plagiarized** code will not be marked and will end up in a zero grade.
3. You are responsible for the submitted code.
4. **Document format**. Please submit <u>only</u> the code file (**c** file) containing the code of your project. Please rename it as follows: "**P1_YourStudentID_FirstNameLastName_SectionNo.c**".
5. **Input/output file name**. Make sure that the input/output file names are the same as in the specifications.
6. Include your full name, student ID, and section number in the beginning of your file.
7. Please do not compress the file, <u>only the C-file is needed</u>.
8. Files not following the convention in point 2 will not be marked.

Good luck!