EHB208E **Data Structures & Programming** **Spring 2023**

1st Homework

Write a "C" program that reads the matrix data (integer numbers) from a given file (input.csv) and builds this matrix using a linked-list data structure. The size of the matrix is not known. Do not use an array to define this matrix. Your program should be able to:

(a) Print the matrix defined by the linked-list data structure to an output text file.
(b) Calculate the number of zeros in the given matrix (defined by the linked list) and print the result in an output text file.
(c) Find the duplicated element values in the given matrix (defined by the linked list) and print the result in an output text file.

SUBMISSIONS:

You are expected to submit a C/C++ code file and a report in pdf format.
This assignment is partly graded automatically. We should be able to run your compiled code as:

```
./yourcompiledcode [OPTION] [-i INPUTFILE] [-o OUTPUTFILE]
```

A detailed explanation about input-output configuration is explained in appendix.

Note 1: Turnitin can be used to check for any cheating. Please submit your own work!
Note 2: The text in the output file should be correctly typed (Not even extra spaces allowed. It is type-strict as the language:).

Important: Your code should be properly commented. Uncommented code will get partial credit. You need to do your assignment alone. Code sharing among students or using code from any other source is not allowed.

Best luck 😊

INPUT-OUTPUT FILE FORMAT

Let's have a folder structure as:

-your_student_id
    -input.csv
    -yourcompiledcode

And let`s have an input csv file containing the following lines:

2,9,4
0,4,0
9,0,12

Then, after running your compiled code in terminal as:

./yourcompiledcode [OPTION] -i input.csv -o result.txt

the folder structure will become:

-your_student_id
    -input.csv
    -yourcompiledcode
    -result.txt

where a result.txt file is formed, and the content of the file should be:

2,9,4
0,4,0
9,0,12

when [OPTION] is replaced with –print, or

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when [OPTION] is --nzeros, or

9,4

when [OPTION] is –duplicates. So, the valid options are –duplicates, --nzeros, and –print.