COMP 1603 Computer Programming III

2018/2019 Semester 2

Assignment 2

Given: Friday 1st March, 2019.

Date Due: Friday 15th March, 2019 at 10:00 pm

No late assignments will be accepted.

Submission: Upload a zip file containing your **source code, input file and output file** to My Elearning by the deadline. Name your source file your first name initial + last name e.g. MSlater for Marcus Slater. Place your name and ID at the top of your source code file. In the documentation at the top of your source code, indicate what percentage of your program worked. E.g. "My program worked 95%, but could not process two lines of data properly".

No My Elearning Access?
In this case you are to email your files (no .exe files) to COMP1603P3UWI@gmail.com. You must indicate a reason why you have no My Elearning access in the email. The COMP1603P3UWI@gmail.com email address is not monitored otherwise.
(**Also** cc your email to Michael.Hosein@sta.uwi.edu).

Input/Output
All input data must be stored in a file **"input.txt".**
All output data must be stored in a file **"output.txt".**
All output must also be printed to the screen.

Overview

This assignment is designed to give you experience in manipulating singly linked lists.

Description

The input file contains several pairs of integers of arbitrary length. Data is terminated by a line containing -1 only. Your program must read two integers from the file. The built-in data types such as *int* and *long* have a maximum fixed length so variables of these types **cannot be used** to input the integers from the file. Each large integer must be read from the file and stored in a singly linked list, **one digit per node**.

The least significant digit of the large integer must be stored at the top of the list and the most significant digit must be stored at the end of the list. Assume that each large integer has at most 50 digits.

After creating the linked lists for the two large integers, you must find the sum of the integers. This sum must be stored in another linked list.

Finally, your program must display the two large integers, exactly as they were read from the file as well as their sum. See Example 1 and Example 2 for the format required.
[PTO]

Input:

```
Large Integer 1: 957994954495949457454
Large Integer 2: 77487475474487584 7484
```

Your output should be similar to this:

```
 957994954495949457454 +
 774874754744875847484
======================
1732869709240825304938
======================
```

Example 1

Input:

```
Large Integer 1: 80485080443358
Large Integer 2: 4849850549686868696
```

Your output should be similar to this:

```
      80485080443358 +
 4849850549686868696
 ====================
 4849931034767312054
 ====================
```

Example 2

Input Data for Testing (Data are terminated by -1)

```
957994954495949457454    774874754744875847484
80485080443358     4849850549686868696
99999999    11111111111111111876333
777777678  9999999999
5555555555   4444444444444444465
-1
```

Mark Scheme

a)	Read data for both integers correctly	1 mark
b)	Stored original integers correctly in linked lists	4 marks
c)	Processed and stored sum correctly in new linked list	12 marks
d)	Proper use of functions and parameters	1 mark
e)	Proper **formatting** of output (check examples 1 and 2)	2 marks
f)	Working program	5 marks

Total: 25 marks

Queries: After the assignment is marked, queries can only be made on the exact files submitted. It is your responsibility to ensure that you submitted the correct files. Queries are to be made within one week of the release of the assignment results.