# Worksheet 4: C Fundamentals

Updated: 25th February, 2020

**Note:** You are encouraged to keep notes on your observations and answers to the worksheet exercises and lecture examples.

Assistance is only given when students can demonstrate their own attempt of resolving any problems.

Make sure you include things that went wrong. Your notes will serve as evidence of attempt, and often you can learn a lot analysing things that did not work.

Your notes should include answers to the following questions:

- What programs or websites did you use in the practical today?
- What do you need to remember about your practical work today?
- How does your program work?

You should consult the lecture notes whilst attempting these exercises.

## 1. `C` Basics: Revision

Implement a complete Linked List abstract data type in `C`. You should use the pseudo code from DSA (`COMP1002`) to help you. These are available as additional downloads from Blackboard with this document.

The structures required and function prototypes (and anything else appropriate) must be placed in a header file

Remember: `C` functions most often return an integer (opposite to boolean) indicating success (`0`) or failure (an indicative error number). The more adventurous of you might like to investigate how to set this for a function like **`perror()`** or **`strerror()`** to use.

Due to this requirement, your functions should **heavily** rely on pass-by-reference.

## 2. Archives

Create a static archive of your Linked List abstract data type. Remember you may have to set environment variables and place the header file where the program can find it.

Is it possible to use `#include <LinkedList.h>`?

## 3. Testing

Write a **complete** `C` program to fully test your Linked List archive. Yes, I mean **fully** test every function.

## 4. Makefiles

Create a `makefile` for your test program, use the lecture notes to help.

Try the use of your own variables (eg., `EXEC=myProg` & `$(EXEC)`) as well as the built-in variables (eg., `$<`). In other words, use everything from the lecture notes!

**End of Worksheet**