

## Software Systems

**Mini Assignment #5**

Due: November 26, 2017 on myCourses at 23:30

Linked Lists and Modular Programming

This assignment explores malloc, makefile, modular programming, and git.

The central problem you will solve is a linked-list like the one shown in the lecture slides. You do not need to use the lecture slides.

Construct a modular program from three source files: main.c, list.c and list.h. The file main.c will be used to call the functions provided by the file list.c. The file list.c builds a private linked-list within the list.c named space. The file list.h contains the definition of the list's node structure. Use #ifndef to protect the possible multiple inclusion of list.h, as we talked about in class.

Use a makefile to compile your assignment. Use git to version control the development of your assignment. To prove that you used a makefile submit your makefile file. To prove that you used git, save the output from git log into a text file and submit that file.

The program will run as follows:

- The main() function uses a while loop accepting only positive integer numbers ( $n > 0$ ) from the user. The loop terminates once the user enters a non-positive value. The user is prompted for each number one at a time.
- In the loop, main() calls functions from the list.o named space that creates a private linked list using malloc.
- The following function signatures are supported by list.c:
  - void newList();
    - This function assumes there is a private global linked-list pointer in list.c called head that is used to point to the beginning of a linked-list. This function call simply initializes this pointer to NULL.
  - int addNode(int value);
    - This function mallocs a new node and copies the parameter value into the node. This function then adds the node to the head of the linked-list. The function ends by returning true for success and false for failure. A node has the following structure: struct NODE { int data; struct NODE \*next; }.
  - void prettyPrint();
    - This function assumes a global pointer called head exists. Using this head pointer is traverses the linked-list printing all the values stored in the list.
- When the loop terminates the program prints to screen all the numbers in the list. The output should be in reverse order.
- The program then terminates.
- Do NOT use recursion.

## WHAT TO HAND IN

Submit your .c files, makefile, and gitlog.txt files.

The TA will compile and run your program on the Trottier computers.

## HOW IT WILL BE GRADED

Points removed for bad practices:

- -1 for not following instructions
- -1 for not indenting, spacing, and/or commenting
- -1 for not using good variable names

This assignment is worth 20 points:

- +2 main()
- +4 List.c functions as described
- +4 Private data structure
- +4 #ifndef and list.h usage
- +2 GIT usage
- +4 Correct makefile usage