Operating System: Winter 2019
CSC 360
Assignment 01 - Part 1

January 14, 2019

1 Doubly linked list

A doubly linked list is a data structure that consists of set of nodes. Each node contains three variables: two pointers as links (referencing the previous and the next node) and one variable containing any type of data. Previous and next links of the beginning and ending nodes, respectively, point to NULL in order to represent termination of the list.

1.1 Simplified Interface

A simple implementation of the doubly linked list is provided in the following gist: https://gist.github.com/mexuaz/a0014cf8836900ab36e86ce6fe8dd45a

All the methods in this implementation have at least one reference to a arbitrary node of link list (not preferably head or tail of list) to apply the relevant function.

2 Assignment

There are also some other methods that are not implemented but the function signature is provided. Fairly brief and comprehensive comments are given for all methods including those not implemented. Using comments you have to complete two of the non-implemented functions chosen by your TA. Notice that you are not allowed to change the implemented functions.

1. void swap(struct node* ref1, struct node* ref2);
2. void reverse(struct node* ref);
3. struct node* concat(struct node* ref1, struct node* ref2);
4. struct node* unique(struct node* ref);
5. struct node* shift_left(struct node* ref, int n);
6. int distance(struct node* ref1, struct node* ref2);
7. struct node* rotate_left(struct node* ref, int n);
8. void minmax(struct node* ref, int* min, int* max);

Those students seeking extra points might try following method as well.
bool includes(struct node* ref1, struct node* ref2);

2.1 Running and testing your code

In order to compile the source code you could ssh to ‘linux.cs.uvic.ca‘ using this command ‘ssh username@linux.cs.uvic.ca‘ and then use *nano* or *emacs* to create an empty c file named ‘doublylinkedlist.c‘ and copy paste the provided sample code in order to complete it or just simply run wgethttps://gist.github usercontent.com/mexuaz/a0014cf8836900ab36e86ce6fe8dd45a/raw/a0558e9301 12d71f321fb81546954efc4e386c67/doublylinkedlist.c and download the file. Use command ‘gcc -std=c11 -pedantic-errors doublylinkedlist.c -o doublylinkedlist‘ to compile your source to binary code. Using of ‘-std=c11 -pedantic-errors‘ switches for compiling are mandatory in order to make your source code conform the ISO/IEC 9899:2011 standard. Your code should compile without any errors and warnings. After compiling you may run your code with command ‘./doublylinkedlist’ to see if it could provide the expected outputs. Also a sample usage for the d-linked list provided in the main file with the expected outcome in the comments at the beginning of the source code make sure you get the right answer.