

CSCI 1101 – Winter 2017
Laboratory No. 8

More exercises on linked lists

Your task is write and compile the class file. Include the source codes and outputs. Submission deadline: Saturday, March 18, 2017, 11.55 p.m.

The submission requirements and marking scheme are the same as with other labs.

You need the following files - Node.java and LinkedList.java

Write a demo program with three static methods for interleave, reverse and chopSkip, as specified in the exercises 1, 2 and 3 given below. Note that they are all static methods and they are NOT to be added to the LinkedList class.

Use the demo program to build two linked lists and show the operation of the interleave, reverse and chopSkip methods.

Exercise 1:

```
public static LinkedList interleave (LinkedList list1, LinkedList  
list2)
```

that takes in two linked lists of Strings and creates a third linked list that contains the items in the first two lists interleaved. For example, if

list1 → A → B → C → D → E → F and

list2 → W → X → Y → Z then

list3 → A → W → B → X → C → Y → D → Z → E → F

that is, it adds the first item in list1, then the first item in list2, then the second item in list1, the second item in list2, etc. After it reaches the end of the shorter list, it just appends the remaining items from the longer list at the end.

Exercise 2:

```
public static void reverse (LinkedList list)
```

that reverses a given linked list of Strings. Note that you should not create a new linked list but reverse the existing list.

For example, if the input list is a → b → c → d then it should be changed to

d → c → b → a

Hint: First write a swap method that swaps the contents of two nodes at indices x and y. (Note: do not swap the nodes themselves, but just the String data in the nodes). Then use the swap method in your reverse method.

Exercise 3:

```
public static void chopSkip (LinkedList list)
```

that removes every other node (keeping the first, third, ... nodes, removing the second, fourth, ...) from a list. The list

("aardvark", "bear", "cougar", "dog", "elephant", "fox")
should become ("aardvark", "cougar", "elephant")