MERCY COLLEGE

Department of Mathematics and Computer Sciences

CISC 311 Object/Structure/Algorithm I

Fall 2018

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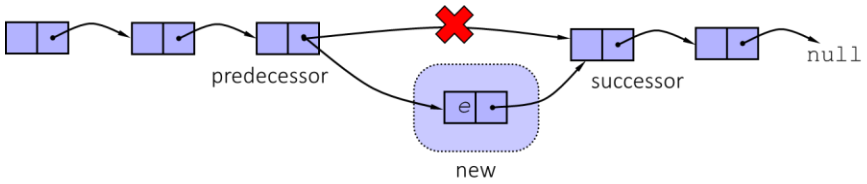
Office Hour: Tuesday 3:00 – 5:00 pm & Wednesday 12:00 – 2:00 pm

Textbook:

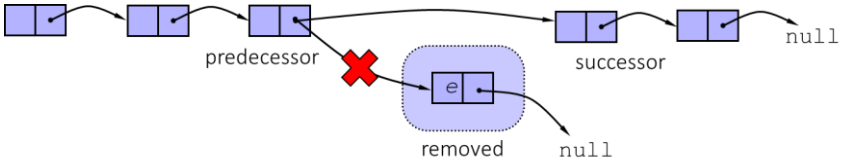
Data Structures & Algorithms in Java, by Michael T. Goodrich, Roberto Tamassia, and Michael H. Goldwasser, 6th ed., Wiley, 2014. ISBN-13: 978-1118771334, ISBN-10: 1118771338

Homework (100 pts):

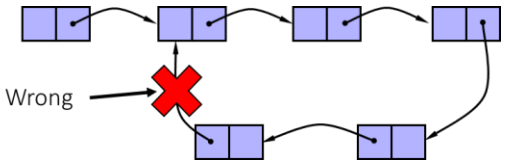
1. Add methods `addBefore(T e, Node<T> n)` and `addAfter(T e, Node<T> n)` in `SinglyLinkedList` class to insert the new element *e* into the linked list before and after the given node *n* (Power Point Slides 04_array_list_and_linked_list.pdf page 33)



2. Add method `remove(Node<T> n)` in `SinglyLinkedList` class to remove the given node *n* from the list and return its element. (Power Point Slides 04_array_list_and_linked_list.pdf page 34)

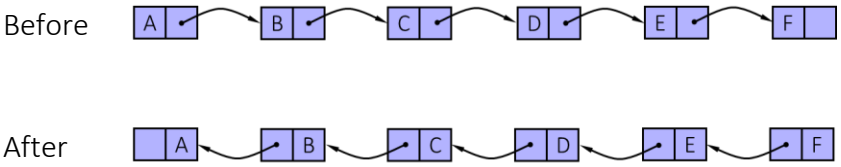


3. You are given a singly linked list. However, someone accidentally assigns the links wrong, which leads to a linked list with a loop. An example is shown in the following diagram:



Write a method that can find the loop and correct the error by having the wrongfully linked node point to `null`. You may create your own linked list to test the program. (Power Point Slides 04_array_list_and_linked_list.pdf page 35)

4. Given a singly linked list, write a method that reverses the order of elements and returns the new linked list. (Power Point Slides 04_array_list_and_linked_list.pdf page 36)



5. Write a method that solves the Josephus problem by using a circularly linked list. (Power Point Slides 04_array_list_and_linked_list.pdf pages 51-55)

Submission Instructions:

1. Write methods in problems 1 and 2 in SinglyLinkedList.java class.
2. Write methods in problems 3, 4 and 5 into a .java file and name it *Lastname_Firstname*_HW4.java, e.g. John Adam's file name should be Adam_John_HW4.java.
3. Add SinglyLinkedList.java and *Lastname_Firstname*_HW4.java files in one folder and name it *Lastname_Firstname*_HW4.
4. Zip the folder and submit it through blackboard → Course Material → Assignment → Assignment_4.

Due: 10/18/2018 11:59pm