Pre-lab Worksheet

CS163 Lab Session #5 - Recursion

Each group member should collaborate on this worksheet. All online students should participate!
The goal of these worksheets is to help prepare you for the next step in programming!

For each of the problems, think about the special cases that would help us move from an iterative solution to a recursive solution. Remember recursion is all about breaking the problem down into smaller sub-problems and re-calling the function over and over with a different piece of the problem.

Problem: Assume you have a linear linked list of single characters. Insert character 'a' immediately before each character 'b' that is encountered.

_____1. What is the simple case: *(what case does not require a loop?)*
current->next == 'b'

_____2. What is the incremental step that transforms the problem into a smaller sub-problem?
current = current->next

_____3. Is there anything that needs to be done BEFORE going to the smaller sub-problem:
No

a. If so, what is it:_____

_____4. Is there anything that needs to be done AFTER the smaller sub-problem has been solved?
No

a. If so, what is it:_____

Problem: Count the number of items in a linear linked list.

_____5. What is the simple case: *(what case does not require a loop?)*
!current

_____6. What is the incremental step that transforms the problem into a smaller sub-problem?
current = current->next

_____7. Is there anything that needs to be done BEFORE going to the smaller sub-problem:
No

a. If so, what is it:_____

_____8. Is there anything that needs to be done AFTER the smaller sub-problem has been solved?

a. If so, what is it:Adding the numbers found so far to the running total