# CS210 Recursion Lab

### Part 1

Answer the following questions:

1. Although, it is not explicitly stated, what is the base case for writeSub()?   
   *When the End of the List is reached, marked by p==0, simply return to begin going back to start of the list.****2 marks****. Look for: understanding of meaning of implied base case condition and action.*
2. What is the base case for insertEndSub()?   
   *When the End of the List is reached, marked by p==0, add a new node to the end of the list and return.****2 marks****. Look for: understanding of meaning of implied base case condition and action.*
3. If you wanted to print the list backwards, how would you modify writeSub()? Why?   
   *How: Move the cout from before the recursive call to after it.  
   Why: Printing will happen as the recursive functions are returning – the end of the list is reached first and the values are printed “Post Order”, much like popping values off a stack.****2 marks****. Look for both How and Why. For Why, look for a clear understanding that actions can happen after a recursive call ends.*

### Part 2

1. Modify the writeSub() function (in the listrec.cpp file) so that it prints in reverse. You should get the following output:

Enter a list of characters : abc

a b [c]

List : cba

List : !cba

1. Write recursive member functions in listrec.cpp that insert the letter ‘a’ before each instance of the letter ‘b’. The function prototypes, aBeforeb() and aBeforebSub()have been created for you.
2. Complete this test plan for aBeforeb(). If you discover errors, correct them and test all cases again.

|  |  |  |  |
| --- | --- | --- | --- |
| **Case** | **Test String** | **Expected Result** | **Success** |
| b at the beginning |  |  |  |
| b at the end |  |  |  |
| b in the middle |  |  |  |
| Multiple b’s |  |  |  |

***1 mark****.* ***0.5*** *for having all test strings.* ***0.5*** *for having correct “expected results”.   
Lab instructor should sign off on successful tests.*