

This Lab Exercise is an extension of Lab 18.1. If you have not completed Lab 18.1, you should work on that first.

Due Date:

You must demonstrate the solution to this lab exercise to the instructor by **Wednesday, December 4**, in order to receive full credit for this work.

Programming Exercise

Enhance your code from Lab 18.1 to include recursive use of the linked list.

Interactive Commands from Lab 18.1

The commands (from Lab 18.1) which should still be supported are:

- **a** APPEND a new node at the end of the list
- **d** DELETE a node from the list
- **i** INSERT a node into the list, maintaining the sorted order.
- **p** PRINT the contents of the list.
- **h** HELP text
- **q** QUIT (end the program)

The APPEND, DELETE, and INSERT commands should prompt the user to enter an integer value.

New Interactive Commands for Lab 20.1

The new commands which should be supported are:

- **r** RECURSIVELY print the contents of the list.
- **b** Recursively print the contents of the list BACKWARDS.
- **c** Use recursion to COUNT the number of nodes in the list.
- **t** Use recursion to calculate the TOTAL of the **value** fields for all nodes in the list.

Sample Output

A sample of the output is shown beginning below, and continuing on the next page. (In this example, the text which the user enters is shown in **bold** font.)

Sample output
Command: i Enter number to insert into the list: 4 Command: i Enter number to insert into the list: 54

Sample output

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Command: i
Enter number to insert into the list: 3

Command: i
Enter number to insert into the list: 99

Command: i
Enter number to insert into the list: 55

Command: p
head=0059FC90
0059FC90: value= 3 next= 0059FC20
0059FC20: value= 4 next= 0059FC58
0059FC58: value= 54 next= 0059FD00
0059FD00: value= 55 next= 0059FCC8
0059FCC8: value= 99 next= 00000000

Command: r
Recursive print of list, head=0059FC90
0059FC90: value= 3 next= 0059FC20
0059FC20: value= 4 next= 0059FC58
0059FC58: value= 54 next= 0059FD00
0059FD00: value= 55 next= 0059FCC8
0059FCC8: value= 99 next= 00000000

Command: b
BACKWARDS recursive print of list, head=0059FC90
0059FCC8: value= 99 next= 00000000
0059FD00: value= 55 next= 0059FCC8
0059FC58: value= 54 next= 0059FD00
0059FC20: value= 4 next= 0059FC58
0059FC90: value= 3 next= 0059FC20

Command: c
Number of nodes in list, head=0059FC90, count=5

Command: t
Total of all value fields in list, head=0059FC90, total=215

Command: q
Exiting program with status = 0
```