10910EECS204001  
Data Structure HW1-Linked List

NTHU OJ 12902

Description:

In this homework, you are asked to implement some common functions used in linked list. For example, insert, delete, reverse, clear, and print. Notice: there exist no duplicated elements in the linked list.

1. InsertFront NewData: Insert NewData to the front of linked list.  
   (NewData is an integer and is in the range of [0,500000] )
2. InsertBack NewData: Insert NewData to the end of linked list.
3. InsertBefore K NewData: Insert NewData before the node containing K.
4. InsertAfter K NewData: Insert NewData after the node containing K.  
   (For command InsertBefore and InsertBack, if there is no node containing K, then do nothing.)
5. Delete K: Delete the node containing K and free the memory.
6. DeleteFront: Delete the first node in linked list and free the memory.
7. DeleteBack: Delete the last node in linked list and free the memory.  
   (For command Delete, DeleteFront, and DeleteBack, if there is no node containing K or the linked list is empty, do nothing.)
8. Reverse K J: Reverse all nodes between K and J, including K and J.   
   (For command Reverse, if K and J do not both exist in the linked list, then do nothing. If K and J both exist in the linked list, then K is near the head of linked list compared to J.)
9. Clear: Clear the linked list and free the memory.
10. Print: Output all the data in the linked list from the first one to the last.  
    (For command Print, every element is followed by a blank character and a newline character in the end of line.)

Input:

N lines of commands with N<=200000. Every element following a command is an integer. No duplicate numbers exist in the linked list at the same time.

Output:

For output command “Print”, print out all the integers stored in the linked list. If the linked list is empty, print nothing but a new line character.

Sample I/O:

|  |  |  |
| --- | --- | --- |
| Input | InsertBack 0  InsertFront 1  InsertAfter 1 2  Print  Delete 3  DeleteFront  Print | Print  InsertBack 0  InsertFront 1  InsertAfter 1 2  InsertBefore 1 3  Reverse 1 2  Print |
| Output | 1 2 0  2 0 | 3 2 1 0 |

Notice:

Any kind of STL is not allowed in this homework.

Your code needs to be submitted to NTHU OJ and iLMS before the deadline.