Doubly-Linked Lists

In addition to the Next pointer, each cell has a Prev pointer that points back to its predecessor.

This makes deletion harder, from a coding perspective, because there are more things to keep consistent.

From a performance perspective, however, this is a big win. We know immediately what the previous cell is, so delete is $O(1)$. 
Insertion into a doubly-linked list

• New Element we want to insert (new)
• pointer to the list (lp)

Let’s Begin...

1. Set up the pointers in the new element

2. Change the next pointer of the previous element.
3. Change the previous pointer of the element

4. Return the pointer to the new element

• Special Cases:
  • list is NULL
  • list->prev is NULL