Solution 1

```java
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class Program {
  // O(n) time | O(1) space - where n is the number of nodes in the Linked List
  public static LinkedList shiftLinkedList(LinkedList head, int k) {
    int listLength = 1;
    LinkedList listTail = head;
    while (listTail.next != null) {
      listTail = listTail.next;
      listLength++;
    }

    int offset = Math.abs(k) % listLength;
    if (offset == 0) return head;
    int newTailPosition = k > 0 ? listLength - offset : offset;
    LinkedList newTail = head;
    for (int i = 1; i < newTailPosition; i++) {
      newTail = newTail.next;
    }

    LinkedList newHead = newTail.next;
    newTail.next = null;
    listTail.next = head;
    return newHead;
  }

  static class LinkedList {
    public int value;
    public LinkedList next;

    public LinkedList(int value) {
      this.value = value;
      next = null;
    }
  }
}
```