21. Merge Two Sorted Lists

Easy,
LinkedList.

Merge two sorted linked lists and return it as a new list. The new list should be made by splicing together the nodes of the first two lists.

Example:

```
Input: 1->2->4, 1->3->4
Output: 1->1->2->3->4->4
```

解法

这道题是比较基础的linkedlist题。
只要判断val的大小然后插入到res中就可以了。

follow up:
降低空间复杂度和时间复杂度的方法是，不新设一个res，而是直接插入到l1或者l2中。
这样就可以节省空间了。

java

```java
/**
 * Definition for singly-linked list.
 * public class ListNode {
 *     int val;
 *     ListNode next;
 *     ListNode(int x) { val = x; }
 * }
 */
class Solution {
    public ListNode mergeTwoLists(ListNode l1, ListNode l2) {
        if(l1==null && l2!=null) return l2;
        else if(l1!=null && l2==null) return l1;
        else if(l1==null && l2==null) return null;
```

```java
        ListNode tmp = new ListNode(-1);
        ListNode res = tmp;
        while(l1!=null || l2!=null){
            if(l1!=null && l2!=null){
                if(l1.val>l2.val){
                    tmp.next = new ListNode(l2.val);
                    tmp=tmp.next;
                    l2=l2.next;
                }else if(l2.val>l1.val){
                    tmp.next = new ListNode(l1.val);
                    tmp=tmp.next;
                    l1=l1.next;
                }else if(l1.val==l2.val){
                    tmp.next = new ListNode(l1.val);
                    tmp=tmp.next;
                    tmp.next = new ListNode(l2.val);
                    tmp=tmp.next;
                    l1=l1.next;
                    l2=l2.next;
                }
            }
            else if(l1==null){
                tmp.next = new ListNode(l2.val);
                tmp=tmp.next;
                l2=l2.next;
            }else if(l2==null){
                tmp.next = new ListNode(l1.val);
                tmp=tmp.next;
                l1=l1.next;
            }
        }
        return res.next;
    }
}
```